

special history study

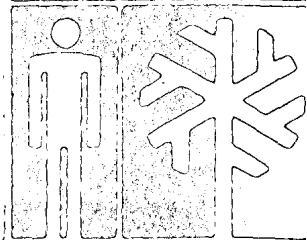
NATIONAL PARK SERVICE
DENVER SERVICE CENTER
BRANCH OF MICROGRAPHICS
LIBRARY COPY

IN
STORAGE

STORAGE
M

D 773

FORT SUMTER
FORT MOULTRIE HECF-HDCP



NATIONAL MONUMENT / SOUTH CAROLINA

Color Scans

4/22/2003

SPECIAL HISTORY STUDY
FORT MOULTRIE HECF-HDCP
FORT SUMTER NATIONAL MONUMENT
SOUTH CAROLINA

Prepared by
Edwin C. Bearss

Denver Service Center
Historic Preservation Team
National Park Service
United States Department of the Interior
Denver, Colorado

May 1974

FOREWORD

This report has been prepared to satisfy the research needs as outlined in Historical Resource Study Proposal FOSU-H-8, Historic Structure Report, Historical Data Section, HECF-HDCP, Fort Moultrie, and the memorandum of agreement prepared by Superintendent Bill Harris and Historian E.C. Bearss, dated July 18, 1973. In addition to detailing the structural history of the facility, information on the furnishings sufficient to answer the needs of a Furnishing Study have been included. To provide data needed to interpret the HECF-HDCP's role in World War II, sections have been included describing the German U-boat offensive in American waters of January-July 1942, and activities at the HECF-HDCP in the period March 1942-October 1944.

A number of persons have assisted in the preparation of this report. Particular thanks are due Superintendent Bill Harris, Chief of Interpretation and Resource Management J.M. Dennis, Chief of Maintenance Mel Baker, Park Historian Ben Nelson, and Administrative Officer Bill Barnes of Fort Sumter National Monument, for their assistance and encouragement in and around the site. Several ex-servicemen — John Sams, Ernest Glover, and James Budds — shared with me photographs and recollections of their World War II duty at the Fort Moultrie HECF.

Gibson Smith of National Archives' Modern Military Records Division spent many hours running down leads and pulling documents. Mrs. K. M. Lloyd of the Navy History Division, Department of the Navy, was helpful in my review of the War Diaries; Dr. Richard Sommers and John Slonaker of the U.S. Army Military History Research Collection at Carlisle, Pa., went out of their way to ensure that the day spent examining documents, books, and pamphlets entrusted to their care was enjoyable and profitable; Mrs. V. DeStafano, Chief of Reference Branch of the Army's Audio-Visual Library called to my attention and made available many period photographs of the HECF-HDCP and its equipment; John Wike, an old friend and colleague of my days with Office, Chief of Military History, and a veteran of service in the Coast Artillery in the 1930's, took a deep interest in the project and brought to my attention a number of sources with which I was unfamiliar.

Historical Architect John Garner of the Southeast Region visited the structure with me, and pinpointed changes in the fabric.

My colleagues, Superintendent Harris, John Garner, Miss Vera Craig of the Harpers Ferry Center, and Chief Historian Harry Pfanz, reviewed the manuscript, and made valuable suggestions. Finally, I am grateful to Linda Wedel who had the unenviable task of turning my scrawl into a typed manuscript.

CONTENTS

FOREWORD	iii
LIST OF ILLUSTRATIONS	viii
I. ADMINISTRATIVE DATA	1
A. Name and Number of Structure	1
B. Proposed Use of Structure	1
C. Justification for Such Use	1
D. Provision for Operating Structure	1
E. Cooperative Agreement, if any, Executed or Proposed for Operating Structure	1
F. Brief Description of Proposed Construction Activity	1
G. Estimate of Cost	2
II. THE ARMED FORCES ESTABLISH A HECP-HDCP	3
A. The Third Reich's Victories Pose a Threat	3
B. The Establishment of a HECP at Fort Moultrie	4
1. Admiral Stark Makes a Proposal	4
2. The Military Calls for Establishment of HECPs	6
3. Secretary Stinson Calls on the Army to Activate the HECPs	7
4. The Army Activates a Combined HECP-HDCP at Fort Moultrie	9
5. The Navy Installs and Mans the Communications and Signal Gear	11
6. Personal Recollections of the HECP	13
III. CONSTRUCTION HISTORY OF THE PERMANENT HECP-HDCP	15
A. Plans are Drawn and Approved	15
1. Air Power Causes the Coast Artillery to Revise Its Thinking	15
2. A Number of Offices Make Their Contribution	17
B. Steps are Taken to Locate the HECP and HDCP in the Same Structure	23
C. Funding the Project	26
D. The Construction and Occupation of the Fort Moultrie Combined HECP-HDCP	27

IV.	EQUIPMENT AND GEAR (ARMY) FOUND IN THE HECP-HDCP	31
A.	Army Materiel and Personnel	31
1.	Army Equipment Found in the HECP-HDCP	31
2.	Army Personnel Assigned to the HECP-HDCP and Related Facilities	33
B.	Other Equipment Found in the HECP-HDCP for which the Armed Services were Responsible	40
1.	Teletype Installations	40
2.	Radar Equipment	41
C.	Responsibilities of HDCP Personnel	41
1.	Their Mission	41
2.	The Armament	41
3.	Fire Control Responsibilities	45
4.	Functions in Antiaircraft Defense	46
5.	Role in Underwater Defenses	46
6.	The Radio Communication Net	46
V.	STRUCTURAL HISTORY OF THE BUILDING 1948-1973	48
A.	The Navy Establishes a Test and Calibration Facility	48
1.	The Navy Renovates the Structure	48
2.	The 1960 Improvements	49
3.	The 1962 Improvements	50
4.	Changes Necessitated by a New Air Conditioning System	51
B.	The National Park Service Takes Over	51
VI.	THE U-BOAT OFFENSIVE IN AMERICAN WATERS	53
A.	Admiral Doenitz Redeploys His U-boats	53
B.	The Offensive Begins	56
1.	The U.S. Navy Prepares for the U-boats	56
2.	The Establishment of Joint Operation Centers	57
3.	The U-boats Strike	58
C.	The Offensive Continues into February	60
1.	An Administrative Change	60
2.	The U-boats Up Their Score	60
3.	Groping for a Solution	62
a.	The Proposal for Contact Minefields	62
b.	The Struggle for More Patrol Aircraft	63
c.	Efforts to Increase the Number of Patrol Vessels	64
d.	A Shortage of Escorts Prevents Convoying Coastal Shipping	66

D.	The Germans Increase the Pressure	68
1.	The U-boats Invade the Caribbean	68
2.	The March Attacks as Seen by Eastern Sea Frontier	69
3.	Eastern Sea Frontier Changes and Regulates Routes	71
4.	A Shortage of Vessels and Aircraft Hamstrings Plans for Convoying	72
5.	The Sinkings Erode the Merchant Marine's Morale	73
6.	March Antisubmarine Activities in the Sixth Naval District	74
7.	April Brings no Relief	74
a.	Admiral Andrews Reaches Some Erroneous Conclusions	74
b.	Refueling the U-boats in the Western Atlantic	76
c.	Admiral Andrews Sees Some Hope	77
8.	The "Bucket Brigade"	78
9.	The Loss of the Trawler "St. Cathan"	79
E.	The Americans' Defense Improves	79
1.	Admiral Doenitz Shifts the Theatre of Operations	79
2.	The Tide Turns	80
3.	The Coastal Convoy System Begins	81
4.	The German Offensive Wanes	84
a.	Losses Again Climb	84
b.	German Mine Fields Claim their First Victims	85
c.	Admiral Andrews Makes a Bold Proposal	85
F.	The U-boat Attacks Ebb	86
1.	Doenitz Calls off His Offensive in American Waters	86
2.	The Results – An Appreciation	86
3.	Action Off Charleston Harbor	87
4.	Admiral Andrews Commends His Command	88
VII.	THE HECP AND WORLD WAR II	89
A.	The Mine Scare	89
B.	Operations in 1943	90
C.	Operations in 1944	91
D.	The Charleston Hurricane of October 1944	92
APPENDICES		
Appendix A.	Instructions for the Examination and Entry into United States Ports in Time of War	93
Appendix B.	"Chief of Coast Artillery's Comments on Advanced Copy of 'Instructions for the Examination and Entry into United States Ports in Time of War' "	119
BIBLIOGRAPHY		125
ILLUSTRATIONS		131

LIST OF ILLUSTRATIONS

Plate

- | | | |
|-------|--|-----|
| I. | General Plan "Harbor Defenses of Charleston, HDCP and HECP, Fort Moultrie, South Carolina, March 1943" | 133 |
| II. | Architectural Details, "Harbor Defenses of Charleston, HDCP and HECP, Fort Moultrie, South Carolina, March 1943" | 135 |
| III. | The south elevation of the combined HECP-HDCP and Signal Tower, c. 1942 | 137 |
| IV. | Signalman Budds manning the southeast blinker light atop the Signal Tower, c. 1942 | 139 |
| V. | Signalman Budds at the 50-power telescope at the southwest corner of Signal Tower, c. 1942 | 141 |
| VI. | Message Center Room at combined HECP-HDCP Fort Moultrie, 1941-44 | 143 |
| VII. | Underground Emergency Message Center, Fort Moultrie bombproof, 1941-44 | 145 |
| VIII. | Communications Room of Fort Moultrie Harbor Defense Command Post, 1941-44 | 147 |
| IX. | Harbor Defense Command Post, Harbor Defenses of Charleston, 1941-44 | 149 |
| X. | Emergency Harbor Defense Command Post, c. 1943 | 151 |
| XI. | Observation Post in temporary HECP-HDCP at Fort Moultrie, c. 1942 | 153 |
| XII. | "Joint Army and Navy Radio Receiving and Transmitting Station" in Fort Moultrie temporary HECP-HDCP, c. 1942 | 155 |
| XIII. | Emergency power plant underground at Fort Moultrie, c. 1942 | 157 |

XIV.	Underground Harbor Defense radio receiver and transmitting station Fort Moultrie, c. 1942	159
XV.	Battery Dix Plotting Room, Fort Wadsworth, 1932	161
XVI.	An observation post in unidentified HECP-HDCP	163
XVII.	Construction of combined HECP-HDCP at Fort Moultrie, July 14, 1943	165
XVIII.	New HECP-HDCP at Fort Moultrie, winter of 1943-44	167

I. ADMINISTRATIVE DATA

A. Name and Number of Structure

Combined Harbor Entrance Control Post and Harbor Defense Command Post, Structure No. FOSU-3T, Fort Moultrie, South Carolina. This structure, because of its intimate relation to Fort Moultrie, No. 3, is of First Order of Significance.

B. Proposed Use of Structure

The exterior of the structure will be restored to its appearance during the period 1944-45, while the observation platform and selected rooms will be restored, refurnished, and equipped as they were in World War II, when this installation was a nerve center for the defenses of Charleston Harbor.

C. Justification for Such Use

The approved Interpretive Prospectus provides that as a Bicentennial Area, Fort Moultrie be developed to interpret two hundred years of seacoast fortifications. In World War II the location of the Harbor Entrance Control Post and Harbor Defense Command Post at the old masonry fort enhanced its importance. In 1943-44 this splinterproof and gasproof concrete structure was built to house the combined HECP-HDCP, which had been previously sheltered in temporary quarters. The construction and occupation of this building by the military thus represents and will be interpreted as a "logical culmination in the theme of developing coastal defenses."

D. Provision for Operating Structure

The combined HECP-HDCP will be restored and partially refurnished, thus constituting an exhibit in place to tell the role of Fort Moultrie in World War II.

E. Cooperative Agreement, if any, Executed or Proposed for Operating Structure

No cooperative agreement will be required to operate the structure.

F. Brief Description of Proposed Construction Activity

1. The exterior of the structure will be restored to its appearance, c. 1944-45. This will involve: (a) painting with toned-down camouflage paint the exterior walls of the Signal Tower and Observation Post; (b) removal of the cross-arm from the flag hoist and replacement of guy wires and rigging; (c) removal of the metal foul weather cover sheltering the outside stairways; (d) removal of the spar at the southeast corner of the Observation Deck; (e) removal of the metal supports connecting the Observation Deck railings with the deck of the Signal Tower; (f) removal of the guard railing above the entrance way; (g) replacing the steps providing access from the Observation Deck to deck of Signal Tower; (h) replacing the two C.W.S. Intakes and their guy wires; and (i) positioning on the deck of the Signal Tower the following equipment and gear – two blinker lights, a flag bag, and a case for the semaphore flags – and on the Observation Deck a 50-power telescope.

In carrying out this work, the attention of the curators and restoration architects is called to plates III-XVIII of this report.

2. The interiors of certain rooms will be restored and refurnished to their appearance, c. 1944-45. This will involve: (a) removal of modern lighting fixtures installed by the National Park Service and their replacement with period fixtures; (b) removal of carpeting from the ground floor rooms and the Observation Post; (c) repainting the interiors of the rooms to be refurnished and interpreted to their colors during the years 1944-45; (d) removal of storm door between Center Corridor and Escape Passage; (e) replacement of concrete instrument base in southeast corner of Observation Post; (f) removal of curtains and rods from Observation Post; (g) restoration of air conditioning equipment on ground floor to its condition in World War II; (h) relocation of partition separating the Message Center Room and the Duty Officers' and Operations Room; (i) positioning wood bulletin boards on south and west walls of Duty Officers' and Operations Room; (j) positioning sheet metal 7' x 12' map board on west wall of Duty Officers' and Operations Room; and (k) positioning wood radio cabinet near north wall of Radio Room.

The interior of the Signal Tower will not be restored to its appearance, c. 1944-45, or refurnished, as it will serve as a public contact station.

3. The following rooms will be refurnished: the Observation Post, Duty Officers' and Operations Room, Message Center Room, Radio Room, and Power Room. In acquiring and positioning the equipment and furnishings, the curators will be guided by the inventories, tables of organization, and photographs found in this report. The photographs found on Plates III-XIV are of the equipment when it was positioned on or in the temporary HECF-HDCP. When the facilities were relocated into the splinterproof and gasproof structure in March 1944, the former equipment was utilized and positioned in the same relative location in the new building as it had occupied in the temporary quarters. Plate XV is a photograph of the Observation Post at a similar facility.

A failure to secure any photographs of the HECF Room, and the fact that its furnishings were similar to those found in the Duty Officers' and Operations Rooms, is the reason for the recommendation that it not be refurnished and interpreted.

G. Estimate of Cost

Restoration of Structure	\$60,000 lump sum
------------------------------------	-------------------

II. THE ARMED FORCES ESTABLISH A HECP-HDCP

A. The Third Reich's Victories Pose a Threat

When Adolf Hitler plunged the world into war with his invasion of Poland on September 1, 1939, most people in the United States, while sympathetic to the Allies, hoped and prayed their country would remain at peace. Most of the people, believing France had the world's most powerful army and knowing that the British Empire ruled the seas, felt that the Allies would defeat the Third Reich. The German *blitzkrieg* in Poland opened a few eyes, but the "phoney war" of the autumn and winter of 1939-40 seemingly insured a victory for the Allies. Hitler then struck north. Denmark was occupied, and Norway invaded in the first days of April 1940. Many of our people and commentators agreed with Prime Minister Neville Chamberlain of Great Britain that "Hitler had missed the bus." They soon found, as a wag wrote, that he had caught an airplane.

Then on May 10, 1940, the German war machine turned west. Within hours Luxembourg was occupied and the Netherlands and Belgium invaded. The British Expeditionary Force and 70 French divisions advanced into Belgium to battle the *Wehrmacht*. It was a trap. As allied columns pushed forward, German armored spearheads thrust through the "supposedly impenetrable" Ardennes, and smashed the Ninth French Army at Sedan. Pouring across the Meuse, the Germans mounted a *blitzkrieg* that sent their panzers racing across northern France to the English Channel. The British Expeditionary Force and several French armies were cut off in the low countries. The miracle of Dunkirk followed. France, however, was doomed. At Compiègne on June 22, French leaders signed an armistice with Germany. Meanwhile, Italy had entered the war on the side of her Axis partner. The British Empire, now led by Winston Churchill, was left to battle the aggressors alone.

The sweeping Axis successes had confounded most Americans. President Franklin D. Roosevelt and many of his fellow citizens were committed to aiding the British and her allies by all measures short of war. But in the United States there were millions of isolationists, disillusioned by their nation's experiences in World War I and the postwar years, who were determined that no American boys would die in another European war. Like Abraham Lincoln, Roosevelt was a master politician, and he gauged the temper of his people on how far he could go at any given time toward assisting the Allies. In addition, time was required to build up and modernize the nation's armed forces, which had been allowed to wither in the postwar period, as economy measures were instituted and spending for defense pared.

In August and September 1940, the nation's attention was engrossed by the battle of Britain. The RAF held firm against the *Luftwaffe's* onslaught, and then *Reichsmarschall* Hermann Göring turned to terror bombings of British cities. When this

failed, German hopes for victory over the British Empire rested on the battle of the Atlantic. Submarine bases were established in Brittany and on the Bay of Biscay. Increased resources were allotted by the Reich for construction of U-boats and recruiting and training of crews.

B. The Establishment of a HECP at Fort Moultrie

1. Admiral Stark Makes a Proposal

It was apparent to responsible officers in the United States armed forces that with the threat to the nation's security becoming increasingly grave, steps would have to be taken to protect shipping entering and leaving our ports and harbors. Five years before, in 1935, it had been agreed by the Army and Navy that Defensive Sea Areas would be established as needed in the approaches and harbors of selected important ports. This provided for legal naval control of areas as specified in Presidential Executive Orders. Actual naval control of certain harbors could be undertaken, as it had in the past, previous to the necessary legal steps, in the name of national security. This control could be initiated locally, or on order of the Chief of Naval Operations.¹

But with the situation becoming increasingly grave, Chief of Naval Operations H. R. Stark on November 5, 1940, called to the attention of the Commandants of the Naval Districts, the "importance of adequate joint provisions for defense of harbors." Local plans, Admiral Stark continued, "must provide for prompt and decisive action, from the time of their execution, against air, submarine and surface action by enemy or neutral craft, particularly by stratagem, threatening our harbors or by the shipping using them." Essential to this was direct and quick acting group control of the forces jointly involved in the defense of the harbor. As such threats were primarily naval in character, the Commandants were to take the lead in initiating effective countermeasures.

"Organization, task assignment and the degree of control to be imposed on commercial shipping" were matters for local determination. The machinery for a high degree of control, however, should be available when required. Control should in general be based on considerations of the "Category of Defense importance of the port, convenience to the shipping involved and current information." For guidance, an outline had been prepared of the principal elements involved:

(A) Harbor Entrance Control Post.

- (1) Functions and personnel — Here all information bearing on "subject measures should be received with least possible delay." The HECP would be the "nerve center" of this system, and be continuously

1. Joint Action of the Army and Navy, 1935, found in Itr., Ingersoll to Chief of Staff, U.S. Army, Dec. 11, 1941, Service, Supply and Procurement, Service Group, Installations Branch, Harbor and Coastal Defense Decimal File, 1914-46, CCO.3/AJ-1 and 2, NA, RG 165.

manned by two "Duty Officer," one Army and one Navy, with assisting personnel. Each Duty Officer would be empowered and instructed "to initiate, in the name of the commander of the forces concerned and as required in any situation, immediate, decisive and coordinated action, on the part of the respective Army and Navy forces under control of the station."

- (2) Requirements
 - (a) Clear View
 - (b) Signal Tower
 - (c) Communications, direct and continuously manned to Forces directly controlled including (B) to (H) below.
 - Inshore Patrol Headquarters.
 - Army Harbor Defense Headquarters.
 - Army Aircraft Warning Service.

This HECF could be so located, in an already planned shore unit of the local Army or Navy forces involved, as to *minimize* need for additional communication personnel and circuits.

- (B) Underwater Defenses.
 - (1) Listening Posts including:
 - (a) Army installations.
 - (b) Navy Installations as necessary in addition to (a). Where necessary for protection of shipping, this should include loop or loops on the bottom wall to seaward and additional listening devices in the more restricted parts of the harbor. Availability of material, technique and prospective locations of these installations, not already covered, would be treated in separate correspondence.
 - (2) Net and Boom protection against submarine and fast motor boats, including gates and gate vessels (Navy).
 - (3) Army Minefield Controls.
- (C) Harbor Batteries.
 - (1) Army AA Batteries, searchlights and Locators.
 - (2) Navy AA automatic weapons, within naval reservations, as authorized.
 - (3) Army harbor defense batteries, fixed or mobile.
 - (4) AA Batteries of Fleet vessels present, as directed by S.O.P.A., and coordinated with those of the Army.

- (D) Aircraft units that are assigned tasks in defense of harbor.
 - (1) Army group.
 - (2) Navy group.

 - (E) Patrol vessels. (Navy)
 - (1) Harbor entrance patrol to cover following functions:
 - (a) Entrance control vessel to insure against unauthorized entrance. This check should be in addition to any other applied by either outer or harbor controls.
It may comprise:
 - Search for unneutral character, clearance through gate to temporary berth for further examination, definite clearance to inside berth or other procedure as dictated by circumstances.
 - Its result should be made known to the HECP.
-
- (F) Coastal Lookouts (Navy)

While this group was not necessarily concerned exclusively with the protection of any one harbor area, those in position to so function should be in immediate communication with the HECP to facilitate prompt reports of suspicious craft in the vicinity. Continuous watch should be kept for actual or suspected mine laying in the harbor or its approaches by aircraft or submarines.
-
- (G) Balloon Barrages (Army).
-
- (H) Mine Sweepers (Navy).

As the Commandants would see, this scheme involved only the Army Harbor Defense Forces, and, for the Navy, those groups of the Inshore Patrol assigned tasks in defense of harbors.

Chief of Naval Operations Stark also sent a copy of his letter advocating the establishment of Harbor Entrance Control Posts to Army Chief of Staff George C. Marshall for his consideration.²

2. The Military Calls for Establishment of HECPs

After receiving comments from a number of the Commandants and discussing his proposal with members of General Marshall's War Plans Staff, it was agreed by the senior officers to officially authorize establishment of Harbor Entrance Control Posts and to define their missions. This was done in a memorandum signed by Chief of Naval Operations Stark on May 29, 1941, after a momentous week in which the foray of the German battleship *Bismarck* focused world attention on the battle of the Atlantic, and

2. Ltr., Stark to Commandants, Nov. 5, 1940, see footnote 1 on page 4.

by Chief of Staff Marshall on June 23, the day after Hitler attacked the Soviet Union. The HECPs were to be the central point for coordination and joint operation of Army and Navy elements of the harbor defense system whose mission was to: (a) "collect and disseminate information of activities in the defensive sea area"; (b) to control "unescorted commercial shipping in the defensive coastal areas"; and (c) to take prompt and decisive action "to operate the elements of the harbor defense," to deny enemy action within the defensive coastal area.

Each of the posts was "visualized" as being continuously manned by "an officer of both the Army and Navy and the necessary assisting personnel for clerical and communication duties, where the Army and Navy officers are the Senior Local Commanders of their respective services, or their direct representatives with authority to take the action necessary to accomplish the mission."

When the Army or Navy officer on duty at the Harbor Entrance Control Post was a representative of the Local Senior Commander, his authority was to be defined by the senior officer whom he represented.

The ideal location for a HECP would be one which commanded "a complete view" of the approaches and the harbor. It would also be ideal to place it in the same building as the Army's Harbor Defense Command Post. Circumstances being what they were, neither of these ideals could be uniformly realized at all sites, where Harbor Entrance Control Posts were to be established.

Each HECP was to be equipped with a chart room, "where information relative to enemy activities, or other activities" which were potentially important could be plotted on a graph or on situation maps of the defensive coastal sector; and with all of "the communications necessary to receive and disseminate information and to communicate with the elements of the harbor defense system." Wherever feasible, to eliminate as many communication installations as possible, efforts were to be made to place in the Harbor Entrance Command Post building a receiving station for underwater listening posts, indicator loops, sono bouys, and a visual signal station. Such an arrangement reflected an ideal, which could not be uniformly realized.³

3. Secretary Stinson Calls on the Army to Activate the HECPs

The summer of 1941 found the *Wehrmacht* thrusting deep into the Soviet Union on a broad front, reaching from the approaches to Leningrad in the north, beyond Smolensk on the road to Moskva on the central front, and beyond Kiev in the Ukraine.

3. "Mission, General Operation and Desirable Location of a Harbor Entrance Control Post," approved by the Chief of Naval Operations, May 29, 1941, and the Chief of Staff, June 23, 1941, Records of the Adjutant General's Office, Classified Correspondence, 1940-42, AGO 660.2 (5-29-41 Sec. 1), NA, RG 407.

At sea U-boat wolfpacks attacked convoys enroute to Britain with lend-lease supplies. United States forces were sent to Iceland in July, and President Roosevelt made his declaration, warning Germany against sending her submarines into waters of the Western Hemisphere.

Taking cognizance of the new policy to assist the Allies with all aid short of war, Secretary of War Henry L. Stinson on October 2, 1941, directed Adjutant General Emory S. Adams to forward to the commanding generals of the Eastern, Western, and Southern Defense Commands instructions calling their attention to the confidential memorandum outlining the "Mission, General Operation, and Desirable Location of a Harbor Entrance Control Post."

They were reminded that within each of the Harbor Defenses under their command a HECP would be organized and "operated on a training basis and be prepared for operation on a war basis."

Full use would be made of existing structures, facilities, and material, with the minimum modifications necessary to adapt them for the dual requirements of Harbor Defense Command and Harbor Entrance Control Posts.

Preliminary plans for "permanent or semi-permanent installations" were to be provided by the War Department, together with cost estimates by services. These would be submitted as independent projects for each Harbor Defense, and were to reach the War Department not later than November 1, 1941. Plans must provide for utilization to the maximum degree of extant facilities. The adaption of existing Harbor Defense Command Posts by additions or changes rather than new construction was encouraged. Existing signal stations, where suitably located, would be utilized, structural modifications being made where necessary. Although desirable, it was not mandatory that the signal station be at the HECP.

Harbor Entrance Control Posts would usually be on or in the vicinity of Military Reservations. Facilities for quartering and messing Army and Navy personnel would not be provided in the HECP unless the remoteness of the station from a Military Reservation made such action necessary. In case of remote stations, leasing of an existing building in the area would be considered for quartering and messing troops.

Bachelor officers' quarters, when available and when requested by the Navy for their personnel, would be provided on a basis commensurate with corresponding rank, grade, or rating for the Army. Messing facilities for Navy personnel would be made available by the Army.

Subject to local agreement with Naval authorities and approval by the War Department, facilities would be provided as follows:

By the Army — (a) space for Harbor Entrance Control Post, if situated on a Military Reservation; (b) signal station and equipment if located on a Military Reservation; (c) landlines, submarine cables, and radio communications, which were a primary responsibility of the Army; and (d) teletype communications when stations were on a war basis, or when other methods of communication did not suffice.

By the Navy — (a) signal stations and their equipment when situated off a Military Reservation; (b) for signal stations provided by the Army, such additional or special equipment over and above that authorized by Army Tables of Basic Allowance as were deemed essential by local Naval authorities; and (c) landlines, submarine cables, and radio communications which were a primary responsibility of "the Navy in accordance with the principles given in Paragraph 152 of Joint Actions of the Army and Navy, subject to local agreement on details."

"Maintenance funds were to be provided by the Army and Navy for the material installed by each."⁴

4. The Army Activates a Combined HECF-HDCP at Fort Moultrie

The Secretary's letter was no surprise to command personnel in the Southern Coastal Frontier. Two months before, on August 6, the Local Joint Planning Committee, Carolina Sector, Southern Coastal Frontier, had met in Charleston, and had decided to recommend establishment of a Harbor Entrance Control Post at Fort Moultrie.⁵

Six weeks passed before any action was taken on this recommendation. Then on September 19, the Chief of Coast Artillery notified the Commanding General, Southern Defense Command, that a Harbor Entrance Control Post would be established for Charleston Harbor "without further War Department action." He could improvise the necessary facilities or utilize an existing structure. If, however, additional construction were needed, the location, details of construction, and estimated costs thereof must be determined by a local board.⁶

Headquarters, Harbor Defenses, Charleston, was therefore able to respond promptly to Secretary Stinson's communication, and reported steps had been taken

4. Gerow to Adjutant General, Oct. 2, 1941; Van Sickler to Commanding General, Western Defense Command, Oct. 6, 1941, Records of the Adjutant General's Office, Classified Correspondence, 1940-42, AG 660.2 (5-29-41 Sec. 1), NA, RG 407. L. T. Gerow was a brigadier general and acting Assistant Chief of Staff and D. R. Van Sickler was adjutant general.

5. Minutes of Meeting of Local Joint Planning Committee, Carolina Sector, Southern Coastal Frontier, Aug. 5, 1941, NA, RG 165.

6. Chief, Coast Artillery to Adjutant General, Sept. 18, 1941, NA, RG 165.

"to secure a suitable location and establish a Harbor Entrance Control Post." The two-story frame World War I Signal Building, on the Northwest Bastion of Fort Moultrie, was accordingly "repaired and placed in first class condition and rearranged so as to provide a Harbor Defense Signal Station, a Harbor Defense Command Post and Harbor Entrance Control Post, using the three double rooms upstairs." The signal station (message center) was in the west room, the Harbor Defense Command Post in the middle room, and the Harbor Entrance Control Post in the east room. All stations were provided with D.P.F., and possessed "a clear view of the harbor."

The lower floor of the structure was used for sleeping accommodations for the necessary Navy enlisted personnel. Bathing and toilet facilities were provided in the building for both commissioned and enlisted personnel.

The roof of the structure was equipped with a platform and signal tower for display of flag signals. Access to the roof was by stairway from the Signal Station.

The Signal Station was equipped with one SCR-281 radio and motor-generator. This set was employed for communication with the Harbor Defense Net. In addition, the Navy was to provide three radio receiving sets and two transmitting sets to be installed in the Harbor Defense Signal Station for HECF communication with the Navy.

The Harbor Defense Signal Station was also linked by telephone with the Post Telephone System and the Harbor Defense Switchboard, while the HDCEP had telephone connections with the Harbor Defense Switchboard and Post Telephone System. At the same time, the HECF was tied in with the Post Telephone System. Other radio equipment on hand included one Collins Transmitter B-22 and one Hammerlund Super-Pro-210X. No crystals were on hand for the transmitter, so no frequencies had been assigned.

Enlisted naval personnel on duty at the HECF were being messed with Battery D, 13th Coast Artillery. Commissioned naval officers on duty at the Harbor Entrance Control Post had the option of being quartered in the BOQ at Battery Thomson or on the post.⁷

7. 3d Ind., 10/16/41, HQS,HD/ Charleston to CG, 4th CA District, War Department, General and Special Staffs, Service, Supply and Procurement, Service Group, Installations Branch, Harbor and Coastal Defense Decimal File 1914-46, 660.3/36-B-3, NA, RG 165.

The only funds needed during the fiscal year for outfitting the combined HECP-HDCP was \$4,000 for installation of a heating plant, based on these estimates:

	Material	Labor	Construction	Total
Room and Fuel	\$ 300.00	\$ 250.00	\$ 92.00	\$ 642.00
Heating System	1,320.00	1,540.00	929.00	3,289.00

Office equipment needed included typewriters, desks, chairs, and a teletype machine. Cost of the furnishings and typewriter was placed at \$250.⁸

On October 27 Headquarters, Southern Defense Command, approved the proposal to utilize the World War I Signal Building as the HECP-HDCP and to install a heating system in the structure.⁹

The Chief of Coast Artillery, on reviewing the subject correspondence, pointed out that the Harbor Defense Commander had authority to requisition necessary desks, chairs, and fire extinguishers, as well as one 12-inch carriage typewriter. He was also agreeable to making \$3,931 available to the Chief of Engineers for installation of a heating plant.¹⁰

5. The Navy Installs and Mans the Communications and Signal Gear

Chief of Naval Operations Stark on October 9 notified the Commandant of the Sixth Naval District that the Navy would provide visual signal gear and radio equipment for the HECP.¹¹

The communications facilities to be provided by the Navy were to consist of two transmitters and the receivers. The former to be Navy Type TCR, 125 watts, manufactured by Radiomarine Corporation of America, and of the channel quick shift type using crystal control only. Crystals would be provided with the transmitters for the frequencies of 2240 kcs. (Army frequency), 2670 kcs. (Coast Guard frequency), 2256 kcs. (Navy frequency), and two frequencies for communications with Harbor telephone circuits of the American Telephone and Telegraph Company. Additional frequencies could be added as needed to a total of ten channels. Power requirements

8. Ibid.

9. Headquarters, Southern Defense Command to Adjutant General, Oct. 29, 1941, NA, RG 165.

10. Chief, Coast Artillery to Adjutant General, Dec. 1, 1941, NA, RG 165.

11. Chief of Naval Operations to Commandant, 6th Naval District, Oct. 9, 1941, War Department, General and Special Staff, Service, Supply and Procurement Division, Installations Branch, Harbor and Coastal Defense Decimal File 1914-46, 660.3/36-B-3, NA, RG 165.

for this type transmitter were 110 volt a.c. 60 cycle 145 kw. The receivers were Navy Model RBJ manufactured by Hammerlund, with a continuous variable from 6.5 to 80 Mc. The power requirements were 110 volt, 60 cycle a.c., 60 watts.

The antenna was to consist of two masts 80 to 125 feet in height, spaced about 150 feet apart. Three 20-foot masts on top of the radio building were needed for receiving antennas.

The ground system was to consist of nineteen 200-foot lengths of No. 4 bare copper wire buried 8 to 12 inches and extending in a radial every ten degrees from a point directly adjacent to the transmitter. The radicals fanned underneath the radio mast.

Naval personnel assigned to the station were to operate the signal flags, blinkers, and searchlights employed for visual communication with naval and commercial shipping.¹²

The Chief of the Bureau of Ships, on October 26, notified the Commandant of the Sixth District that as a guide in allotting money to supply the Harbor Entrance Control Posts, he was providing cost figures for equipment for which the Navy was responsible.

Needed equipment included:

Communication, radio (two transmitters and three receivers installed)	\$12,250
Searchlight (24-inch) with spare parts	7,500
Searchlight (12-inch) with spare parts	450
Blinker gun	.75
Addis lamp	.50
Blinker yardarm, complete with controller, light and wiring (estimated lamp location about 1,000 feet from control room)	350
Telescope or pedestal, multipower	385
Spyglass	106
Binoculars	.80
Set of flags	130
Halliards at .80 per pound	
Blocks, signal halliard, at \$1.50	
Snap hooks at 10 cents	
Signal equipment (very signal pistol, very signal cartridges and rockets)	152
Miscellaneous (including mess gear, portable equipment and consumable supplies)	2,408
Total	\$23,736¹³

12. Proceedings of Meeting of Local Joint Planning Committee, Pensacola, Fla., Sept. 21, 1941; Chief of Naval Operations to Commandant, 12th Naval District, June 23, 1941, NA, RG 407.

13. Chief, Bureau of Ships, to Commandants, Sixth and Eighth Naval Districts, Oct. 26, and Mar. 18, 1942, NA, RG 407 and 165.

In accordance with C.N.O. OP-306-MD (SC) P16-1/00 Serial 077130, August 6, 1941, naval personnel assigned to Type E Harbor Entrance Control Posts, such as the one at Fort Moultrie, were to include: four lieutenants or lieutenant commanders, one chief radioman, two radiomen first class, one radioman second class, six radiomen third class, one chief signalman, four signalmen first class, four signalmen second class, one yeoman first class, four seamen first class, and four seamen second class. Army personnel needed to man the HECP on a war basis included four captains or field officers as "watch keeping officers," one staff sergeant (radio), four operators (radio), four signalmen, one message center clerk, six clerks or messengers, four code clerks, and eight telephone operators.¹⁴

Interviews with Navy men stationed at the HECP in the first 18 months of World War II, along with a review of correspondence, indicates that the number of naval personnel posted at the HECPs was generally less and of a more junior rank than that called for in C.N.O. OP-306-MD (SC) P16-1/00. The Commandant, Eighth Naval District in the autumn of 1941 reported that naval personnel had installed in the Harbor Entrance Control Posts at Pensacola and Galveston TCR transmitters with four crystals and S20R receivers. At Pensacola there were on duty at the HECP, for operation of the signalling equipment, two ensigns and 13 enlisted men with radio and signal experience, while at the Galveston post there were two ensigns and 23 enlisted men.¹⁵

6. Personal Recollections of the HECP

Three Navy signalmen stationed at the HECP-HDCP in 1942-43 were interviewed. This was during the months the facility was in the two-story frame structure on the Northwest Bastion. The trio (John B. Sams, James Budds, and Ernest Glover) enlisted in the Navy soon after Pearl Harbor and attended boot camp at Georgetown, South Carolina. On leaving boot camp, they were designated signalman strikers and sent to the Fort Moultrie HECP. After service at the HECP, the signalmen were usually assigned to YPs.

They agreed that the HECP-HDCP was a two-story frame building. The first floor was used as quarters by the naval personnel. The men slept in double-deck bunks. At one end of the floor was a washroom and head. Since there were no messing facilities in the building, the naval personnel ate at a nearby army mess hall.

On the second floor were three rooms. The east room was the HECP Room. Mr. Sams recalled that there were two desks and several chairs in this room. As this office

14. HQ, 4th Coast Artillery District to Commanding Officer, HD, Galveston, Dec. 11, 1941, NA, RG 407.

15. Commandant, 8th Naval District, to Commanding General, 4th Coast Artillery District, undated, NA, RG 407; personal interviews, John B. Sams, James C. Budds, and Ernest Glover, with E. C. Bearss, Sept. 14 and Oct. 18, 1973.

was staffed by officers and a yeoman striker, the signalmen were unfamiliar with details of its furnishings. A message center-radio room occupied the west suite. Against the east wall were the radios and related equipment. The radiomen sat in chairs facing their sets. In the southwest corner was a table with a typewriter (with coded keys).

The observation deck was reached by an outside stairway attached to the west elevation of the building. The roof was peaked and a wooden walkway led from the stairway to the signal tower. Atop the tower was a captain's walk with an access ladder. Mounted at the southwest and southeast corners of the captain's walk were blinker lights for communicating with shipping.

On the roof of the building, near the southwest corner of the signal tower, was a 50-power telescope. The signal mast paralleled the wooden walkway and was west of the tower.

The tower, which had large double windows in its west and south elevations, was entered through a doorway in the west elevation. Inside the signalmen did their paperwork at a sloping desk (shelf). In a cabinet under the desk were stored the signal books, etc. The flag bag was kept in the tower, as was a case with semaphore flags.

The signalmen's principal duty was to clear ships in and out of the harbor, and to alert the net tenders when to open and close the anti-submarine net. This they did by signalling the men manning the station built on pilings out in the harbor. In communicating with ships, the blinker light was used in preference to the flag hoists. The HECF, however, always flew its identification flags.

As to be expected, the three ex-signalmen had only vague recollections of the HDCP suite which was manned by army personnel.¹⁶

16. Personal interviews, Messrs. Sams, Budds, and Glover, with Bearss, Sept. 14 and Oct. 18, 1973.

III. CONSTRUCTION HISTORY OF THE PERMANENT HECP-HDCP

A. Plans are Drawn and Approved

1. Air Power Causes the Coast Artillery to Revise its Thinking

On June 23, 1941, Chief of Staff Marshall signed for the Army a copy of the memorandum of agreement providing for joint Army-Navy establishment and operation of Harbor Entrance Control Posts. Several months before, the Chief of Coast Artillery and his staff had prepared a report vital to the design and construction of combined HECP-HDCPs. Taking cognizance of what had been happening in Europe since September 1, 1939, the Chief of Coast Artillery in February 1941 issued a pamphlet marked SECRET, providing descriptive data on types of harbor defense installations. Some of this data would apply to the design of future housing for combined HECP-HDCPs.

Structures necessary for harbor defense were to be either bombproof or splinterproof. Prior to the day of dive and heavy bombers, the practice had been to provide "a battery of given caliber protection against cannon of equal caliber." This was still valid insofar as protection from hostile naval gunfire was concerned. But with the advent of air power, protection had to be provided against possible hits or near misses by "demolition bombs, fragmentation bombs, incendiary bombs, small arms, small caliber cannon, and gas." It would be impracticable to provide all seacoast defense elements with complete protection against all classes of air weapons. The degree of protection required, however, varied with the importance of the element to be protected and the facility with which protection could be provided. Cost of protection should be no greater than the importance of the element warranted.

Bombproof protection was to be provided for those elements of the harbor defense — major and minor caliber casemated batteries, and important fire control stations, such as switchboards and plotting rooms. Although it was desirable that Harbor Defense and Groupment Command Posts be given protection against bombs, they, as a minimum, must be splinterproof.

Splinterproof protection, it was pointed out, would vary, as for bombproof, with the importance of the element to be protected and the facility with which such protection can be provided. The degree of protection will also vary with the type of structure and the missile to be defeated. The function to be performed by the personnel in the structure and the nature of the terrain will determine the type of structure. In general, if a structure is to be constructed wholly or partially underground the protection afforded can be increased, within limits, without excessive increase in cost. A structure which must be constructed entirely above ground, for example a fire control tower, where low ground elevation makes such construction necessary, can be given only the minimum protection. Isolated small

important structures should be protected against fire from automatic weapons, incendiary bombs and fragmentation bombs. Depending upon the type of structure, and in view of the trend toward small automatic cannon in aircraft, the minimum protection furnished should be not less than the equivalent of one inch of mild steel. This type of protection should be furnished aboveground splinter-proof structures. Splinter-proof structures wholly or partially below ground should be capable of defeating the 600-lb. bomb when detonated 30 or more feet from the structure and should be provided with the equivalent of one inch of mild steel as protection against fire from automatic weapons.¹

As the minimum, the structure housing the Harbor Defense Command Post was to be splinterproof and gasproof. Advantage was to be taken of the terrain and existing bombproof structures, where such were available, to provide more than splinterproof protection. Floor space was to be greater than what was required as working space for those on duty. Local conditions would dictate the extent to which observation posts were constructed as an integral part or separate from the command post.²

Protection against gas, it was pointed out, was provided for troops in the field by gas masks, protective clothing, gasproof shelters, alarm systems, and training in the measures to be taken against gas. In seacoast fortifications, these measures must be supplemented by a special type of collective protection. Certain operations, such as those of the plotting room, required that the individuals engaged perform their duties without material loss of efficiency, even under continuous concentrations of gas.

Gasproofing consisted primarily in sealing an enclosure, and in providing purified air to the inside. The tighter the sealing, the more effective the gasproofing, especially when relief valves were provided for the outward flow of air from the enclosure to the outside. Relief valves were considered an integral part of seacoast defense gasproof installations. Air drawn through the filter of the collective protector unit was blown into the room in sufficient volume to maintain a low positive pressure of about one-eighth of an inch of water. This pressure prevented the entrance of gas-laden air and forced air from the enclosure through the relief valve. An airlock was provided. It served as an entrance chamber where persons who had been exposed to gas might have it removed from their clothing before entering the protected room. Collective protection, in general, was to be installed only in buildings of permanent bombproof or splinterproof construction. The number of persons to be accommodated in any one installation was to be as small as consistent with proper performance of duty.

1. Pamphlet, "Notes on Type Harbor Defense Installations," prepared in Office of Chief of Coast Artillery (AG 660.2[2-3-41] M-WPD) (OCCA 662/FD-1, incl. 1), pp. 1-3, NA, RG 165.

2. Ibid., p. 11.

A supply of one-half cubic foot of fresh air per minute would supply sufficient oxygen for one person, but it was necessary to supply additional quantities of air to a room to dissipate the heat and moisture given off by the occupants. It was considered necessary to supply 200 cubic feet of air per minute for each 10,000 cubic feet of space to maintain the required positive pressure, and also necessary to allow each individual 150 cubic feet of space. When these conditions were met, a 200-cubic foot collective protector would provide three cubic feet of air per minute per individual, which amount had been found sufficient to provide at least eight hours of protection in a temperate climate without excessive discomfort. Because the character of the duties performed in plotting rooms and the requirement that the mental and physical efficiency of personnel must not be impaired during a gas attack, *ten cubic feet of air per man per minute would be provided in such installations.*

Cost of the collective protector unit could be estimated at \$800 for the complete unit and \$270 for each extra canister, when supplied in large quantities. Four canisters were to be furnished as a reserve for each unit within the continental United States.³

2. A Number of Offices Make Their Contribution

During the next several months, the Coast Artillery Board, in view of the changed situation, took a hard look at the need to incorporate measures to provide for splinterproofing and gasproofing of Harbor Defense Command Posts. In their report made May 5, 1941, the Board pointed out that there was an urgent need in each Harbor Defense for early construction of such structures. The Board reported that such a building was currently under contract for the Harbor Defenses of Chesapeake Bay. This structure, which incorporated the recommendations found in "Notes on Type Harbor Defense Installations," would contain 12 rooms to house the following activities:

- (a) **Harbor Defense Command Post**, including space for the harbor defense commander, his executive, operations, intelligence, and communications officers, and records section — five rooms.
- (b) **Inshore Patrol Command Post**, including space for radio, teletype, and telephone communications and records — three rooms.
- (c) **Groupment Command Post** — one room.
- (d) **Antiaircraft Groupment Command Post**, including antiaircraft intelligence center — three rooms.

The subject structure's inside dimensions were 30 x 90 feet, divided by removable partitions into six rooms on each side of a five-foot center hallway, with a short tunnel approach, excavated into a sand dune. On completion, the structure was to be covered with sand.

3. Ibid., pp. 12-14.

Protection against splinters at 50 feet would be provided by 30 inches of earth, 12 inches of reinforced concrete, or one and one-half inches of "mild steel."

To provide observation over "critical portions of the harbor entrance," an observation post for the commander was to be provided. The height of the site was to govern the type of construction of the observation post. Where ground elevation was less than 50 feet, a tower might be necessary, but where elevation was in excess of this height, a "cottage" type of construction could suffice. The "cottage" would resemble nearby buildings.

A telephone cable to the fire control switchboard room was required. The power cable for lighting was to be provided from the nearest source of power or a generating set in the structure. Provisions were to be made for gasproofing the building.⁴

On reviewing the Board's letter, the Chief, Coast Artillery, agreed that the design used for the subject Harbor Defense Command Post was satisfactory. He believed, however, that "a smaller layout should be provided for smaller Harbor Defenses, when the seacoast artillery groupment or the anti-aircraft groupment, or both may not be required, or may be established separately from the Harbor Defense Command Post."

In view of reports received from Joint Army and Navy Planning Committees, it was apparent that a visual signal station would be an essential adjunct of Harbor Defense Command Posts, though not necessarily at the same location. It was, therefore, deemed essential that a layout for a visual signal station be included in the subject plans. The Chief of Coast Artillery, however, did not believe it mandatory that the signal station be bombproof or splinterproof. It should be given the same protection by steel plates as the observation tower.⁵

The Chief of Engineers, whose department was entrusted with preparing a general plan for Harbor Defense Command Posts, studied the requirements as outlined in "Notes on Type Harbor Defense Installations" and in the Board's letter of May 5. One imperfection was observed that would have to be cleared up before a general layout was prepared. According to the "Notes," the floor space was to "be no more than is required as working space for those on duty." As nothing was said on this subject in the letter of May 5, it was assumed that the Coast Artillery Board had concurred. It was known, however, that at Sandy Hook, the commanding general had directed the District Engineer to include such facilities as quarters, latrines, showers, etc., in plans for the Harbor Defense Command Post to be constructed in McCook-Reynolds, an obsolete mortar battery.

4. Bowen to Chief, Coast Artillery, May 5, 1941, (CAB 665) (C of E 665-504) (CWS 600.21 114) (5-5-41) (OCCA 665.2/J), NA, RG 165.

5. 1st Ind., May 28, 1941, see footnote 4 on page above.

In reference to the visual signal tower, the Chief Engineer asked to be provided with a sketch showing the desired size and room arrangement. Finally, in regard to the statement in the letter of May 5 referring to "nearest source of power," he presumed this meant the nearest source of power other than commercial. If not, no reason could be found for providing a generator in the Fort Story Harbor Defense Command Post.⁶

By the time the correspondence was returned to Chief of Coast Artillery Joseph A. Green, the confidential memorandum titled, "Mission, General Operation and Desirable Location of a Harbor Entrance Control Station," had been circulated. General Green and his staff were delighted to see that all facilities required by the Army and Navy in a Harbor Entrance Control Post, except a visual signal station, were included in the requirements for a Harbor Defense Command Post cited in the Coast Artillery Board's letter of May 5.

Replying to the Chief of Engineers endorsement, he pointed out that the "Notes" omitted any "prescription" of the number of square feet of floor space required for a Harbor Defense Command Post. The floor space would, accordingly, vary in different installations, depending whether or not space was required for the Inshore Patrol Commander, Antiaircraft Group Commander, and Seacoast Artillery Groupment Commander. As the command post for the Harbor Defenses of Chesapeake Bay included all these activities, it would require greater floor space than most of the others.

On further thought, it had been decided to include in the subject structures two latrines — an officers' and an enlisted men's. The former would have one water closet and a like number of washstands.

As to be expected, the nearest source of power was not intended to be commercial.⁷

The Chief of Engineers, upon return of the correspondence, put his draftsmen to work. By the first week of August, a layout plan had been prepared showing "a proposed arrangement of a Harbor Defense Command Post with space provided" for:

Type A — Harbor Defense Commander
Inshore Patrol
Antiaircraft Groupment
Seacoast Artillery Groupment

6. 2d Ind., June 13, 1941, see footnote 4 on page 18.

7. 3d Ind., July 9, 1941, see footnote 4 on page 18.

- Type B — Harbor Defense Commander
Inshore Patrol
Antiaircraft Groupment
- Type C — Harbor Defense Commander
Inshore Patrol
Seacoast Artillery Groupment
- Type D — Harbor Defense Commander
Inshore Patrol

When he forwarded the layout to Chief of Coast Artillery Green on August 6, Chief Engineer Julian L. Schley observed that no provision had been made for a switchboard room or a visual signal station. As soon as necessary information on the latter was received from the Coast Artillery, the desired layout would be prepared.⁸

On reviewing the drawings, Chief of Coast Artillery Green became concerned at the probable high cost of the Harbor Defense Command Posts. The estimated cost of a Type A station would be about \$80,000. On August 11 he referred the correspondence and layouts to the Coast Artillery Board, with a recommendation that steps be taken to reduce the "size and cost" of these facilities. Elements not "strictly essential to the tactical operation and authorized" in the "Notes" were to be eliminated. He believed that in some instances the rooms were larger than necessary and the number of partitions excessive.⁹

The Coast Artillery Board, on restudying the situation, concluded that the size of the rooms shown on the plan could not be reduced, and still provide adequate working space for personnel on duty therein. In addition, large charts must be used in the "ordinary operation" of the Harbor Defense Command Post. The "actual allotment" of the rooms to be occupied by one section or group was a decision of the Harbor Defense Commander, dictated by local conditions, and should not be circumscribed," the Board reported.¹⁰

Confronted by the position taken by the Board, Chief of Coast Artillery Green turned to his staff to secure plans for less expensive structures for housing Harbor Defense Command Posts. A review was made of the current status of projects for the subject structures, and an estimate made as to the type plan most nearly suitable to the probable requirements of defenses for command posts which were not already approved or under consideration. The results of the review were tabulated:

8. 4th Ind., Aug. 6, 1941, see footnote 4 on page 18.

9. 5th Ind., Aug. 11, 1941, see footnote 4 on page 18.

10. 6th Ind., Aug. 22, 1941, see footnote 4 on page 18.

Harbor Defense	Probable Type Required	Remarks
New Bedford	"D"	(a)
Narragansett Bay	"A"	(c)
Charleston	"D"	(a)
Key West	"D"	(a)
Galveston	"D"	(a)
Los Angeles	"D"	
Alaska:		
Sitka	"D"	(a)
Seward	"D"	(a)
Kodiak	"D"	(a)
Dutch Harbor	"D"	(a)
Kaneohe Bay	"D"	(a)
Bermuda	"D"	(a)
Jamaica		(b)
Trinidad	"B"	
Roosevelt Roads	"A"	
Newfoundland	"D"	(a)

Notes: (a) Type plan affords much more space than necessary. Office space equivalent to six rooms 13' x 15' should be adequate.

(b) Only one fixed battery. A group command post should suffice.

(c) Needs uncertain. May require special type omitting Inshore Patrol facilities.

It was observed that the majority of the Harbor Defense Command Posts yet to be provided were for less important Harbor Defenses, having only one or two groups of seacoast artillery.

Referring to the general plan, the Chief of Coast Artillery suggested that, as the partitions were movable, the legends indicating the purpose and size of individual offices be omitted. Such action would facilitate adaptation of the designs to local requirements. Legends locating the latrines, air locks, power plant, fan recesses, and heating and dehumidifying facilities should be retained.

The plan was satisfactory for use as a guide in designing command posts for larger harbor defenses. It was vital, however, that costs of these stations be kept at the "minimum consistent" with providing necessary facilities. General Green, therefore, recommended that a fifth type of Harbor Defense Command Post be designed for the smaller harbor defenses — those identified by the letter (a) in the remarks column of

the aforementioned table. The design was to be based on the following requirements:

- a. A reduced harbor defense staff which can operate in three rooms:
 - (1) One room for harbor defense commander and executive.
 - (2) One room for S-2 and S-3.
 - (3) One room for radio and communications.
- b. A reduced strength inshore patrol which can operate in two rooms:
 - (1) One room for the inshore patrol commander and assistants.
 - (2) One room for radio and communications.
- c. A combined Army and Navy message center [HECP] and clerical office in one room.
- d. The rooms listed in a, b, and c, above, to have a combined area of 1000 to 1200 square feet.
- e. The size of rooms for power and other utilities should be on a scale appropriate to the office space contemplated.

When forwarding this communication to the War Department, General Green wrote, that recommended "characteristics for a visual signal station" will be transmitted separately.¹¹

The interoffice memorandum in which General Green made recommendations for a new set of plans, took the position that the HECP, where located in the HDCP, should accommodate: (a) the Harbor Defense Commander and his tactical staff (executive, S-3, S-2, communication and searchlight officer). No reason could be found for providing a separate room for each, and three rooms were deemed adequate. The records section was relegated to the rear echelon; (b) three rooms would be ample for the inshore patrol commander; (c) "the antiaircraft officer, or AA groupment or group CP," would find one or two rooms sufficient, depending on the amount of antiaircraft available; and (d) where the HECP was located in the HDCP, a joint plotting room (intelligence center) was desirable.¹²

The Chief of Engineers by October 28, 1941, had made the requested changes to the plans for the Type A, B, C, and D facilities, and had prepared another set incorporating the suggestions made in General Green's letter of September 15, for a smaller type of Harbor Defense Command Post "better adapted for smaller harbor defenses." This type had one entrance, "with only one room for the ventilating, heating, and power equipment."¹³

11. 7th Ind., Sept. 15, 1941, see footnote 4 on page 18.

12. Ibid., interoffice memo, undated.

13. 8th Ind., Oct. 28, 1941, see footnote 4 on page 18.

Chief of Coast Artillery Green on October 31, 1941, approved the drawings, and called on the Chief of Engineers for estimates of the cost of construction and the Chief of Chemical Warfare Services for the cost of gasproofing the structures.¹⁴

On November 19, 1941, the Chief of Engineers estimated the cost of constructing the various types of Harbor Entrance Command Posts at: Types A and B, \$80,000; Type C, \$70,000; Type D, \$62,000; and Type E, \$46,000.¹⁵ The Chief of Chemical Warfare Services, five days later, placed the cost of gasproofing Types A-D at \$4,000 and Type E at \$3,000.¹⁶

B. Steps are Taken to Locate the HECP and HDCP in the Same Structure

Chief of Coast Artillery Green and his staff meanwhile had been studying Secretary of War Stinson's letter of October 2, reminding the commanders of the various Defense Commands that within each of the Harbor Defenses for which they were responsible a Harbor Entrance Control Post would be organized and "operated on a training basis and be prepared for operation on a war basis."¹⁷ After thorough discussions and before he had received the requested estimates from the Chief Engineer and Chief of Chemical Warfare Services for construction of the various types of Harbor Defense Command Posts, General Green on October 25, 1941, informed the Assistant Chief of Staff, War Plans Division, that he had been authorized to establish Harbor Entrance Control Posts in the Harbor Defenses in the continental United States and Alaska. In general, he observed, "suitable and adequate facilities" for establishment of these installations did not exist and "no funds... are available or included in estimates." The necessary facilities were to include: a signal station; joint Army-Navy Intelligence Room; Harbor Defense Command Post; Inshore Command Post; message center; radio room; receiving station for underwater listening post, magnetic indicator loop, and sonobuoys; power for signal purposes; latrine and other utilities; sleeping accommodations for crews where stations were remote from existing housing; and communications (telephones, cables, including lease of commercial facilities pending installation of government-owned equipment).

14. 9th Ind., Oct. 31, 1941, see footnote 4 on page 18.

15. 10th Ind., Nov. 19, 1941, see footnote 4 on page 18.

16. 11th Ind., Nov. 24, 1941, see footnote 4 on page 18.

17. Gerow to Adjutant General, Oct. 2, 1941; Van Sickler to Commanding General, Western Defense Command, Oct. 6, 1941, Records of the Adjutant General's Office, Classified Correspondence, 1940-42, AG 660.2 (5-29-41 Sec. 7), NA, RG 407.

To establish Harbor Entrance Control Posts in each of the Harbor Defenses, where existing facilities were inadequate, required \$500,000.¹⁸

Chief of Coast Artillery Green on December 5, two days before the Japanese attacked Pearl Harbor, completed his review of plans forwarded by his subordinates for Harbor Entrance Control Posts in accordance with the Secretary's order of October 2. He found a "wide variation . . . in the sizes and facilities proposed." Writing the Adjutant General, he observed that a "type plan for harbor defense command posts which include provision for Navy elements concerned in joint operation of the harbor entrance control post should be adopted and furnished to all harbor defense commanders to serve as a guide in the preparation of plans and estimates for new permanent installations of that character where necessary."

Plans prepared by the Chief Engineer (Drawing S1-63-4) were believed adaptable to meet the requirements of any harbor defense situation. The estimated average costs of construction as given by the Chief Engineer and Chief of Chemical Warfare Services were believed reasonable.

General Green recommended that facilities for the HECPs be incorporated in the plans for the five types of Harbor Defense Command Posts previously approved, and that sufficient copies of the drawings be reproduced to provide at least one set to each Harbor Defense commander.¹⁹

The War Department approved the proposal. With the nation at war, Secretary of War Stinson on December 20, 1941, issued orders placing all Harbor Entrance Control Posts on a "war basis." Project and cost estimates covering new or supplementary facilities necessary to operations on a "war basis", not previously submitted to the

18. Memo to Assistant Chief of Staff, War Plans Division, from Chief Coast Artillery, Oct. 25, 1941, War Department, General and Special Staffs, Service, Supply, and Procurement Division, Installations Branch, Harbor Coastal Defense Decimal File 1914-46, 660.3/ 36-B-3, NA, RG 165. Estimates for the various harbors for the HECPs were: Portland, Me., \$14,000; Portsmouth, N. H., \$14,000; Boston, Mass., \$14,000; Narragansett Bay, R. I., \$14,000; Long Island Sound, \$14,000; Southern New York (including Wadsworth-Hancock Cable), \$85,000; Sandy Hook, N. J., \$10,000; Delaware Bay, \$10,000; Charleston, S. C., \$10,000; Key West, Fla., \$10,000; Pensacola, Fla., \$10,000; Galveston, Tex., \$20,000; San Diego, Calif., \$50,000; Los Angeles, Calif., \$50,000; San Francisco, Calif., \$50,000; Columbia River, \$30,000; Puget Sound, \$20,000; San Juan, Puerto Rico, \$35,000; Sitka, Alaska, \$10,000; Seward, Alaska, \$10,000; Kodiak, Alaska, \$10,000; and Dutch Harbor, Alaska, \$10,000.
19. Herrick to Adjutant General, Dec. 5, 1941, Records of the Adjutant General's Office, Classified Correspondence, 1940-42, AGO 660.2 (5-29-41 Sec. 1), NA, RG 407. H. N. Herrick was a lieutenant colonel in the Office of the Chief of Coast Artillery.

Department in response to its request of October 6 and not available locally, would be forwarded as soon as practicable. Where improvised or temporary Harbor Entrance Control Posts were in operation on a training basis or in process of construction, such facilities would be "utilized in projects for War Basis Harbor Entrance Control Posts to the extent tactically and economically suitable."

Special attention would be given to: (a) providing in cooperation with the Navy, radio communications, a submarine cable, and a land line; (b) the installation and maintenance of adequate communication facilities with Navy underwater detector stations, where such were not now available, or where the underwater detector station is not located in the Harbor Entrance Control Post; (c) full use of an Examination Battery; (d) maintenance of "constant personal liaison" by the Army Officers on duty in the Harbor Entrance Control Post with the Navy Officers on duty therein; and (e) lease of commercial circuits as a substitute for cable installations that could not be completed in a reasonable time.²⁰

Nine days later, the Adjutant General forwarded to the commanders of the various Defense command several documents: (a) copies of the pamphlet "Notes on Type Harbor Defense Installations"; (b) the paper, "Mission, General Operation and Desirable Location of a Harbor Entrance Control Post"; and (c) plans for "harbor defense command posts, which are adapted to the needs of harbor defenses of various sizes and compositions and include space for Navy elements concerned in joint operation of harbor entrance control posts." The subject plans were to constitute a guide in preparing projects and estimates whenever new permanent installations were needed.

Construction costs in continental United States were calculated as:

Cost Estimates

Type Structure	Engineer	C.W.S.	Total
A & B	\$80,000	\$4,000	\$84,000
C	70,000	4,000	74,000
D	62,000	4,000	66,000
E	45,000	3,000	48,000

The commanders were cautioned that the fact they had been provided standardized plans for combined HECF-HDCPs did not obviate the need for continuing

20. Assistant Adjutant General to Commanding General, Southern Defense Command, Dec. 20, 1941, NA, RG 165.

to use existing facilities, if adequate, or for improvising facilities in existing bombproof or splinterproof structures where available.²¹

C. Funding the Project

There was to be one further refinement before construction of any permanent facilities to replace the temporary HECP-HDCPs took place. By March 1, 1942, German U-boats were prowling the Atlantic coastal shipping lanes and several weeks before the antiaircraft defenses had roared into action against phantom Japanese planes and one of the Emperor's submarines had pumped a few rounds into an oilfield near Ventura, California. On that date Chief of Coast Artillery Green notified Chief of Staff Marshall that the orders dated October 2 and 6, 1941, directing that Harbor Entrance Control Posts be organized, had been drafted before the United States had gone to war. Because of the increasingly dangerous international situation at that time, and the necessity of providing usable Harbor Entrance Control Posts without the delays incident to construction of permanent facilities, many of the posts established were of a temporary nature. These had not been provided with protection against enemy action, now considered essential for installations of this character. Many were incapable of being concealed effectively. Confronted with the possibility of a long, bloody war, during which the nation's harbor defenses might be attacked by surface units of the Japanese fleet and German submarines, it was deemed desirable that "durable facilities for harbor defense command posts and harbor entrance control posts be provided in the harbor defenses where such installations were now lacking."

Estimates had been prepared for providing proper permanent facilities for the subject posts in the Harbor Defenses not provided with splinterproof installations of adequate size. The Engineer and Chemical Warfare cost estimates were based on the formula approved in the letter sent out from the Adjutant General's Office on December 29, 1941, to the commanding officers of the various defense commands. Those for the Signal cost data had been taken from local board proceedings covering the modernization program. Estimated costs were:

21. Van Sickler to Commanding General, Northeast Defense Command, Dec. 29, 1941, Records of the Adjutant General's Office, Classified Correspondence, 1940-42, AG 660.2 (5-29-41 Sec. 1), NA, RG 407.

Harbor Defense	Engr.	C.W.S.	Signal	Total
Portland	\$ 96,000	\$ 4,000	\$ 2,522	\$ 102,522
Portsmouth	75,000	4,000	2,179	81,179
New Bedford	54,000	3,000	596	57,596
Narragansett Bay	96,000	4,000	7,720	107,720
Long Island Sound	96,000	4,000	1,591	101,591
Charleston	54,000	3,000	7,305	64,305
Key West	54,000	3,000	909	57,909
Pensacola	75,000	4,000	619	79,619
Galveston	75,000	4,000	2,166	81,166
San Francisco	96,000	4,000	3,534	103,534
Puget Sound	84,000	4,000	2,000	90,000
Totals	\$855,000	\$41,000	\$31,141	\$ 927,141
				<u>185,428</u>
			Total	\$1,112,569
				<u>185,000</u>
				\$ 927,569

To fund this program, it was recommended that authority be granted by the department for inclusion of \$927,569 in the next available estimates for Seacoast Defense funds. Because of the emergency, it was desirable that action be taken to include these funds in Seacoast Defense estimates currently in course of revision for Fiscal Year 1943.²²

The War Department acted promptly. Assistant Chief of Staff Brehan Somervell on March 4, 1942, authorized inclusion of \$927,569 in regular estimates, Seacoast Defense funds, Fiscal Year 1943, for construction of harbor entrance control and harbor defense command posts in harbors not provided with "splinterproof installations of adequate size."²³

D. The Construction and Occupation of the Fort Moultrie Combined HECP-HDCP

More than a year passed before construction commenced on a permanent Harbor Entrance Control Post – Harbor Defense Command Post at Fort Moultrie. The site selected for the new structure, a Type E installation, was outside the scarp and in a re-entrant of the old masonry fort's east land front. Drawings for the structure,

22. Ltr., Cotter to Assistant Chief of Staff, War Plans Division, Mar. 1, 1942, Records of the Adjutant General's Office, Classified Correspondence, 1940-42, AG 660.2 (5-29-41 Sec. 1), NA, RG 407.

23. Ltr., Somervell to Adjutant General, Mar. 4, 1942, Records of the Adjutant General's Office, Classified Correspondence, 1940-42, AG 660.2 (5-29-41 Sec. 1), NA, RG 407.

consisting of 24 sheets, were adapted by the U.S. Engineer's Office in Charleston in March 1943 from the drawings for a Type E combined HECF-HDCF prepared by the Chief Engineer's Office in the autumn of 1941. Copies of sheets Nos. 1 and 2 ("General Plan" and "Architectural Details") are found in the files of Fort Sumter National Memorial. Copies of the other 22 sheets have not been found.

The combined HECF-HDCF was splinterproof and gasproof, with the walls of the main structure being two-foot thick concrete and the roof three-foot thick concrete. A sand fill was banked up around the sides of the main building and covered its roof to a depth of a minimum of three feet.

The Observation Post and Signal Tower were of eight-inch concrete.²⁴

Like Fort Moultrie and the batteries, the exterior of the Observation Post and Signal Tower were camouflaged by a "tone-down" painting in accordance with a report entitled "Camouflage of Seacoast Defenses, Recommendations and Cost Estimates, Fourth Corps Area," prepared by Chief of Engineers pursuant to directive dated March 17, 1941, subject, "Camouflage and Concealment," (AG 007.5) (2-19-41) MD and subsequent directives issued by the Chief of Engineers for passive protective measures.²⁵

The "combined HECF & HDCF" was completed and accepted by the Corps of Engineers on March 7, 1944. Immediately thereafter the equipment and men were moved from the temporary HECF-HDCF in the frame building on the northwest bastion of Fort Moultrie into the new facility.²⁶

On moving in to the new facility, the Army and Navy personnel found that the splinterproof and gasproof concrete and steel structure consisted of three floors. On the ground floor a Center Corridor divided the office spaces. West of the corridor were rooms housing the Duty Officers and Operations Room and the Message Center, while on the opposite side were the HECF and Radio Rooms, Air Conditioning and CWS Room, and Heater Room. At the north end of the floor were the Officers' and Enlisted Men's Latrines, the Front Corridor, Coal Bin, and Entrance. At the south end of the Center Corridor was an Escape Passage.

24. "Harbor Defenses of Charleston, HDCF-HECF, General Plan" and "Architectural Details," Fort Moultrie, S.C., files FSNM.
25. Annex "A," Mission of Harbor Defenses, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General's Office, AG Registered Doc. No. 408 (a), NA, RG 407.
26. Corey to Commanding General, Eastern Defenses, May 22, 1944, File 600.6, Suitland RC, RG 77, Fort Moultrie.

On the second floor was the Observation Post and on the third the Signal Tower. For protection the Observation Post had sand fill positioned against its sides to a level just below the windows.²⁷

The structure, they found, had been gasproofed by means of collective protector installations. To provide for the safety of a maximum of 40 persons in the 16,100 cubic feet of gasproof space, three collective protectors were required with an equal number of canisters. Three reserve canisters were stored in the structure.²⁸

27. "Harbor Defenses of Charleston HDCP and HECF -- Architectural Details and General Plan, March 1943," files FSNM.

28. Annex "F," Gas Defense, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General's Office, AG Registered Doc. 408 (a), NA, RG 407.

IV. EQUIPMENT AND GEAR (ARMY) FOUND IN THE HECP-HDCP

A. Army Materiel and Personnel

1. Army Equipment Found in the HECP-HDCP

While the Navy provided visual signal gear and radio equipment for the Harbor Entrance Control Post (see page 11) and personnel to operate this materiel, stand watch in the Signal Tower, and share responsibilities with the Army as Duty Officers in the HECP Room, the Army provided the rest of the equipment used in the combined HECP-HDCP. Army personnel manned the Harbor Defense Command Post and shared certain duties with the Navy in the HECP.

In accordance with Army T/O&E 4-201-1, Change 3, September 28, 1944, the Fort Moultrie HECP-HDCP was equipped with the following equipment and accessories:

ORDNANCE

Item	Number	Stock or Catalog No.
Arms, scale, M1906		
Scale 1:80,000	2	SNL F-251
Scale 1:62,500	2	SNL F-251
Clinometer, M1912 A1 (mils)	1	SNL F-103
Instrument		
Azimuth, M1910 A1	1	SNL F-84
Trailer, M 18	1	SNL G-221

QUARTERMASTER

Jane's All the World's:		
Aircraft	1	
Fighting Ships	1	
Lloyd's Register of Ships	1	
Fort Record	1	

SIGNAL

Bell		
MC-153	3	4H113
Chest Set TD3	12	4B417-3
Coil C-114 A	25	3C114
Converter M-209	3	6E 1009
Frequency Meter Set SCR-211	1	2C1411
Headset TS-12	8	4B1112

Item	Number	Stock or Catalog No.
Headset HS 30	12	2B820
Microphone T-30	12	2B1630
Panel		
Ticontrol (modified BD-74)	2	4C9974J
BD-75	2	4E3675
Radio Set		
SCR-808	1	25808
SCR-828	4	25828
Reel Unit RL 31	3	6H6231
Telephone Box EE-91	20	4B8191
Test Set		
I-49	1	3F4049
Time Interval Apparatus EE-86	1	4H3086
Tool Set TE-56	2	6R38056
Trailer K-30	2	6J938
Typewriter MC-88	2	6M1688
Voltammeter I-50	3	3F6050 ¹

- Annex "G," Equipment, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General, AG Registered Doc. No. 408 (a), NA, RG 407; "Headquarters and Headquarters Battery, Harbor Defenses, T/O & E4 - 260-1, 63, September 28, 1944," Records of the Adjutant General, General Correspondence, 1940-45, AG 320.3 (23 Feb. 44), NA, RG 407. Information on these items of equipment, components of sets and kits, spare parts, accessories, special equipment, special tools, and allowances of expendable items, are contained in the following publications:

Corps of Engineers:

Army Service Forces Catalogs, Engr. 1-1, 2, 3-1, 6, 7, 8 and 10.

Allowances of Expendable Supplies, Series A.

Ordnance Department:

Standard Nomenclature Lists SNL, and Army Service Forces Catalog,

Ordnance Supply Catalog, Index to which is the Army Service Forces Catalog Ord 2 OPSI.

Circular No. 78, WD, 1944, Allowances of Cleaning and Preserving Materials.

T/A 23, Targets and Target Equipment.

Signal Corps:

Army Service Forces Catalogs, Sig 3, 7, and 8.

Allowances of Expendable Supplies, Army Service Forces Catalog Sig 4-1.

Authorized Signal Corps Parts Lists.

AR 310-200, Military Publications, Allowance and Distribution.

AR 775-10, Qualification in Arms and Ammunition Training Allowances.

Copies of these publications are found in the Modern Military Records Division of the National Archives.

2. Army Personnel Assigned to the HECP-HDCP and Related Facilities

According to the Tables of Organization in effect in 1944 and 1945 the Fort Moultrie HECP-HDCP and related installations were assigned the following Army personnel, with the men to be equipped as indicated:

SECTION II EQUIPMENT - CHEMICAL

1	2								3
Item	Allowances								Basis of distribution and remarks
	BA	BG	BH	BJ	BK	BL	BM	BN	
Mask, gas: Optical, M2-10-5 Mask, Gas, combat, M5-11-7	1 10	2 18	1	8	2 4	2	3	2	1 per indiv (mask, gas sv will be issued as directed by the WD until exhausted. Not to exceed 15 percent of masks issued may be diaphragm until sup is exhausted). 1 per lmn (respirator, dust, M1 will be issued in lieu thereof until sup is exhausted).
E N G I N E E R									
Respirator, dust, M2									
Arrow, steel, 10-in, set	1								
Board, drawing, 42-in x 60-in w/2 adjustable trestles		1							
Drafting equipment, Set No. 1, CAC harbor defense	1								
Instrument, drawing, field set		1							
Pole, ranging, metal, 6-ft, complete	2								
Rod:									
Level, Philadelphia	1								
Stadia, folding, 12-ft	1								
Tape, measuring, steel, Metric and US, 100-ft	2								
Transit, engineer's, 1-minute, complete	1								
NOTE -- See appendix for additional engineer items.									
MEDICAL									
Kit, first aid, gas casualty		1							1 per 25 indiv or maj fraction thereof in T of Opns.
ORDNANCE									
<i>Weapons and miscellaneous</i>									
Carbine, cal. .30, M1	4	4	1						1 per indiv armed w/carbine as shown in sec. I (See SNL B-28). See SNL B-39.
Launcher, grenade, M7		2							
Pistol, automatic, cal. .45, M1911A1		1							1 per indiv armed w/pistol as shown in sec. I. (See SNL B-39).
Rifle:									
Automatic, Browning, cal. .30, M1918A2	1	3							1 per indiv armed w/rifle, auto as shown in sec. I. (See SNL A-4).
U.S., cal. .30, M1	5	10		8	4	2	3	2	1 per indiv armed w/rifle US, cal. .30, M1 as shown in sec. I. (See SNL B-2).
Watch:									
Stop, type B, class 15		1			1				See SNL F-1.
Wrist, 7-jewel		1			1	1			See SNL F-36.
QUARTERMASTER									
<i>Individual equipment</i>									
Bag, canvas field, od, M1936		4							1 per off; WO.
Belt:									
Cartridge, cal. .30, M1923, dismantled	5	10		8	4	2	3	2	1 per indiv armed w/rifle, cal. .30, M1.
Magazine, BAR, M1937	1	3							1 per indiv armed w/rifle, auto.
Pistol or revolver, M1936	4	5	1						1 per indiv not otherwise furnished belt, cartridge or magazine.
Carrier, pack, M1928	11	15	1	9	4	2	3	2	1 per EM.
Cover:									
Canteen, dismantled, M1910	14	19	1	9	4	2	2	2	1 per indiv.
Canvas, muzzle, rifle or carbine	10	15	1	9	4	2	3	2	1 per carbine; rifle, cal. .30, M1.
Haversack, M1928	11	15	1	9	4	2	3	2	1 per EM.
Pocket, magazine:									
Double, web, EM		1							1 per indiv armed w/pistol
For carbine, cal. .30, M1	8	8	2						2 per indiv armed w/carbine.
Strap, carrying, general-purpose		4							1 per bag, canvas, fld (strap, carrying, od, bag, canvas, fld may be issued in lieu thereof until exhausted).
Suspenders, bolt, M1936		4							1 per off; WO.
<i>Organizational equipment</i>									
Axe, intrenching, M1910, with-handle	1	2		1					1 per 10 EM.
Bag, carrying, ammunition		2							1 per launcher, grenade, M7.
Can:									
Corrugated, nesting, galvanized, with-cover					1				1 per met set SCM-12.
Water, 5-gallon	2	4		2	5			1	1 per 5 indiv or fraction thereof; 4 per met set SCM-12.
Carrier:									
Axe, intrenching, M1910	1	2		1					1 per axe, intrenching.
Pick-mattock, intrenching, M1910	2	3		2	1		1		1 per pickmattock, intrenching.
Shovel, intrenching, M1943	8	10	1	6	3	2	2	2	1 per shovel, intrenching, M1943 (carr, shovel, intrenching, M1910 to be issued when shovel, intrenching, M1910 is issued).
Case, Canvas, dispatch		4							1 per off; WO.
Goggles, M1943, with:									
Clear lens									1 per lmn (goggles, M1938 or M1942 will be issued in lieu thereof until exhausted).
Green lens	11	19	1	9	4	2	3	2	1 per indiv not otherwise issued goggles, M1943 w/clear lens when atzd by army or T of Opns comdr.
Kit, sewing	1	1		1					1 per 12 EM.
Lantern, kerosene, Army						1			
Machete, 18-in.-blade, 1942	1	1		1					When atzd by HD comdr.
Outfit, cooking, 20-man		1							2 per 10 EM.
Pick-mattock, intrenching, M1910, with-handle	2	3		2	1		1		
Safe, field keylock		1							
Sheath, machete, 18-in.-blade, M1942	1	1		1					1 per machete.
Shovel, intrenching, M1943	8	10	1	6	3	2	2	2	7 per 10 EM.
Stone, sharpening, pocket	1	1		1					1 per machete.
Tool-set (complete-with-tools), electricians'									1 per electn.
Typewriter, portable, with-carrying-case		1							
Whistle, thunderer		4							1 per off; WO.
SIGNAL									
Belt LC-23-()									1 per lmn.
Climbers LC-5									Do.
Flashlight TL-122-()		2		1	1	1	1	2	
Test Set I-56-()									
Tool Equipment:									
TE-33									1 per lmn; com NCO.
TE-41									1 per rad repairman. ²

2. "Tables of Organization and Equipment, No. 4-200-1, War Department, Washington, D.C., April 14, 1944, Headquarters and Headquarters Battery, Harbor Defense," pp. 14-20. Items of clothing and individual equipment, components of sets and kits, spare parts, accessories, special equipment, special tools, and allowances of expendable items, are contained in the following publications:

Chemical Warfare Service.

Army Service Forces Catalogs, CW 1, 5, 7, and 9.

Allowances of Expendable Supplies, Army Service Forces Catalog CW 4-1.

Corps of Engineers.

Army Service Forces Catalogs, Engr 1-1, 2, 3-1, 6, 7, 8, and 10.

Allowances of Expendable Supplies, Series A.

Medical Department.

Medical Department Supply Catalog.

Army Service Forces Catalog Med 4.

Ordnance Department.

Standard Nomenclature Lists SNL, and Army Service Forces Catalog, Ordnance

Supply Catalog, index to which is the Army Service Forces Catalog Ord 2 OPSI.

Circular No. 78, WD, 1944, Allowances of Cleaning and Preserving Materials.

T/A 23, Targets and Target Equipment.

Quartermaster Corps.

T/E 21, Table of Clothing and Individual Equipment.

Allowances of Expendable Supplies, Army Service Forces Catalog QM 4.

Components, Spare Parts, Accessories and Contents of Chests, Kits and Sets, and Other Items of Quartermaster Property, Circular No. 4, OQMG.

Army Service Forces Catalogs, QM 3-1 and 3-2.

AR 30-3010, Items and Price List of Regular Supplies Controlled by Budget

Credits and Price List of Other Miscellaneous Supplies.

Signal Corps.

Army Service Forces Catalogs, Sig 3, 7, and 8.

Allowances of Expendable Supplies, Army Service Forces Catalog Sig 4-1.

Authorized Signal Corps Parts Lists.

Transportation Corps.

Supply Catalog.

AR 310-200, Military Publications, Allowance and Distribution.

AR 775-10, Qualification in Arms and Ammunition Training Allowances.

Copies of these publications are found in the Modern Military Records Division of National Archives.

B. Other Equipment Found in the HECF-HDCP for which the Armed Services were Responsible

1. Teletype Installations

The following teletype installations were installed and are in operation at Fort Moultrie in 1944-45:

- a. Private line Teletype installed and operated by The U.S. Navy at the HECF, Fort Moultrie. This Teletype was on the Loop Circuit with the following installations:

U.S. Navy Section Base
Charleston, S. C.

Captain of the Port,
Charleston, S. C.

Port Director,
Charleston, S. C.

U.S. Navy Operational,
Charleston, S. C.

Intelligence (Receiving Only),
Charleston, S. C.

- b. Commercial T.W.X. installed at Post Headquarters, Fort Moultrie, S. C., as part of the administration function of the Post and serving the following installations:

Post of Fort Moultrie
Harbor Defenses of Charleston
Staging Area No. 3

- c. Private line Western Union teletype machine installed at Post Headquarters, Fort Moultrie, which served the following installations:

Post of Fort Moultrie
Headquarters, Harbor Defenses of Charleston
Staging Area No. 3³

3. Annex "B," Mission of Harbor Defenses, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General's Office, AG Registered Doc. No. 408 (a), NA, RG 407.

2. Radar Equipment

There was one radar set, model SCR-582, connected with the HECP-HDCP. It had been installed by authority of War Department letter, "Services of Supply, SPSMA 665.1-2, HD, (Fourth Service Command)," subject: "Installation of Radio Set, Defenses of Charleston, dated 7 September 1942." The SCR-582, operated by personnel assigned to the HECP-HDCP, had a ground elevation of 12 feet and an effective antenna height of 87 feet.⁴

C. Responsibilities of HDCP Personnel

1. Their Mission

The mission of the Charleston Harbor Defense project was threefold: (a) to protect the harbor facilities and shipping from naval gunfire in event of attack by enemy surface force; (b) to deny to enemy shipping access to the harbor; and (c) to support the defense against an amphibious assault.

To discharge this mission tactical control of individual batteries and searchlights rested with the Harbor Defense Commander.

Cooperation with the Navy was accomplished through a constant exchange of information between Army and Navy watch officers at the Harbor Entrance Control Post, and with higher echelons of command. Cooperation between the Harbor Defense and the Air Force was accomplished through higher echelons of command.

2. The Armament

By the time the new Harbor Entrance Control Post and Harbor Defense Command Post was operational in March 1944, the only batteries required for the defense of Charleston Harbor were:

4. Ibid.

Battery Name or Construction Number	No. Guns	Caliber and Model of Gun	Model of Mount	Maximum Range	Location by Forts	Existing or Projected	Emplaced or Not Emplaced	Status Upon Completion of Mod. Program
Lord	2	3" RF M 1902M1	PM1902	10700	Moultrie	Existing	Emplaced	Retained
230	2 *	6" M1	BCM4	27150	Moultrie	Existing	Not Emplaced	Retained
520	2	12" BC M 1895M1	BC M 1917	29300	Moultrie	Existing	Emplaced	Retained
AMTB 1-A	2 2	90mm. M1 90mm. M1	M3 M1A1	7500 7500 **	Fort Sumter	Existing Existing	Emplaced Not Emplaced**	Retained Retained
AMTB 2-A	2 2	90mm. M1 90mm. M1	M3 M1A1	7500 7500 **	Moultrie	Existing Existing	Emplaced Not Emplaced**	Retained Retained

*Delivery of gun tubes for Battery Construction No. 230 had been deferred pending the availability of manufacturing facilities.

**Mobile Guns for Batteries 1-A and 2-A were in Storage at Fort Moultrie.⁵

**** Firing Table Maximum Range (19,560 yards).

The two 3-inch rifles of Battery Lord constituted the examination battery for Charleston Harbor.

Since Pearl Harbor, 28 months before, eight of the batteries protecting Charleston Harbor, armed with obsolete weapons, had been disarmed. They were:

- Annex "A," Mission of Harbor Defenses, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General's Office, AG Registered Doc. No. 408 (a), NA, RG 407.

Battery Name or Construction Number	Location by Forts	No. Guns	Caliber and Model of Guns	Model of Mount	Status of Armament	Current Status of Magazines
Battery Huger	Fort Sumter	1	12" BC 1888	BC 1892	Removed	Usable
Battery Huger	Fort Sumter	1	12" DC 1888	DC 1896	Removed	Usable
Battery McCorkle	Ft. Moultrie	1	3" R 1898	B 1903	Removed	Usable
Battery Jasper I	Ft. Moultrie	2	10" DC 1888	DC 1896	Removed	Usable
Battery Jasper II	Ft. Moultrie	2	10" DC 1888 MII	DC 1896	Removed	Usable
Mobile*	Ft. Moultrie	2	155mm 1918	Mobile	*	None
Battery Logan	Ft. Moultrie	1	6" DC 1898	DC 1897 M1	Removed	Usable
Battery Capron	Ft. Moultrie	4	12" Mortars 1890M1	SR 1896	Removed	Usable
Battery Butler	Ft. Moultrie	4	12" Mortars 1890M1	SR 1896	Removed	Usable
Battery Thomson	Ft. Moultrie	2	10" DC 1900	DC 1901	Removed	Usable

* Armament to be removed when Battery Construction No. 230 has been completed.⁶

6. Ibid. Authority for removal of the subject weapons and disarmament of these batteries was provided by:

(1) Authority for Batteries Logan, McCorkle, Jasper I and II being classified as "No Longer Required" was obtained from paragraph IV, Appendix IV, Harbor Defense Projects for Harbor Defenses Included in the Southern Coastal Frontier, Short Title CCA-P-SCR, approved by The Secretary of War in 1st Indorsement, AG 660.2 (3-30-33) (Misc.) E, dated June 16, 1933.

(2) Authority for the abandonment of outmoded Batteries Capron, Butler, Huger, Thomson and Mobile 155mm. upon completion of new batteries was contained in Inclosure No. 1 to Confidential Letter, Secretary of War AG Office, Washington, D.C., AG 660.2 (9-14-40) M-WPD, dated Sept. 27, 1940, subject: "Modernization of Harbor Defense Projects (Continental United States)."

(3) Authority for the immediate abandonment of Batteries Jasper I and II, Butler and Capron was directed by 4th Indorsement, Eastern Defense Command and First Army to Commanding General, Southern Sector, file CA 381, dated Nov. 25, 1942, subject: "Category of Defense," in conformity with basic letter, 1st, 2d and 3d Indorsements.

(4) Authority for transfer of Battery McCorkle to Ordnance Officer, Fourth Service Command, for salvage was contained in letter Headquarters Eastern Defense Command and First Army, CA 662, dated Nov. 12, 1942, to Commanding General, Southern Sector, subject: "Salvage Fixed Batteries, United States Harbor Defense" and 1st Indorsement thereto.

(5) Authority for the salvage of Battery Logan was contained in 3d Indorsement War Department, Adjutant General's Office, Washington, D.C., file AG 660.2 (Jan. 21, 1944) OB-S-E, dated 17 February 1944, to Commanding General, Eastern Defense Command, subject: "Salvage of Fixed Batteries, Harbor Defenses, Eastern Defense Command," to basic letter Harbor Defenses of Charleston to Commanding General, Southern Sector, dated Jan. 21, 1944, subject as above.

(6) Authority for the dismantling and salvage of Battery Huger was contained in 4th Indorsement, Headquarters, Eastern Defense Command and First Army, CA 381, dated Nov. 25, 1942, to Commanding General, Southern Sector, subject: "Category of Defense."

(7) Authority for the abandonment of Battery Thomson and Mobile 155mm. batteries in the Harbor Defenses of Charleston was contained in letter Eastern Defense Command 381-G3 dated Nov. 1, 1943. Copy No. 12, to Commanding General, Southern Sector, subject: "Category of Defense," with 1st, 2d and 3d Indorsements thereto.

(8) Authority for the construction of a new 16" casemated battery in the Harbor Defenses of Charleston was contained in confidential letter, Secretary of War, Adjutant General's Office, Washington, D.C., AG 660.2 (9-14-40) M-WPD, dated Sept. 27, 1940, subject: "Modernization of Harbor Defense Projects (Continental United States)." Subsequently construction of the battery was eliminated from the Harbor Defenses of Charleston in conformity with secret letter War Department, Adjutant General's Office, file 660.2 (11-12-42), subject: "Seacoast Modernization Program," dated Nov. 13, 1942, with 1st and 2d Indorsements thereto.

(9) Authority which approved the elimination of Battery Thomson from the Harbor Defense Project and initiated action to dispose of the armament and accessory equipment was contained in 3d Indorsement, War Department, Adjutant General's Office, Washington, D.C., Apr. 12, 1945, file AG 660.2 (Mar. 26, 1945) OB-SPOPS to letter Headquarters Harbor Defenses of Charleston, file 381, subject: "Category of Defense," dated Mar. 26, 1945.

Four months after Japan surrendered ending World War II, the Assistant Chief of Staff on January 2, 1946, approved a proposal to eliminate Battery Lord from the Harbor Defenses of Charleston. Four days before, the Army Service Command had observed that as the 90mm. AMTB Batteries afforded adequate coverage of the water area at the entrance to the harbor, Battery Lord was supernumerary. Within the next several weeks the two 3-inch rifles, which during the World War II years had served as the examination battery for Charleston Harbor, were dismantled.⁷ With removal of these guns, the historic old masonry fort had lost the last of its teeth. For the first time in 136 years, except during the 1872-76 reconstruction, the old fort was without any weaponry.

3. Fire Control Responsibilities

Personnel posted in the Harbor Defense Command Post had fire control responsibilities. The chart prepared for the Charleston Harbor Defense Project listed these facilities, in addition to the Battery Command Posts, as having "command and fire control elements":

Station	Gas & Bomb Prtn	Elev.	H.I.	Type of Inst	Arc of View		Men	Type of Structure
					LL	RL		
HDCP	SP	15'	40'	A-1	289°57'	94°	28	Mound
SLCP	SP	15'	40'	---	289°57'	94°		Mound
HECP	SP	15'	48'	A-1	289°57'	94°		Mound
Sig. Sta.	SP	43'	58'.5	A-1	All Around		2	Mound
Met. Sta.	None	29'+	34'	---	---		4	Cottage
S.Bd.Rm. 6" Btry.	BP	12' app	---	---	---		3	Emplacement
S.Bd.Rm. 12" Btry.	BP	12' app	---	---	---		3	Emplacement
Tide Sta.	None	9.86	12.81	---	---		0	Wood

7. Bogart to Assistant Chief of Staff, Operations Div., War Dept., Dec. 29, 1945, NA. RG 165.

8. Annex "B," Mission of Harbor Defenses, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General's Office, AG Registered Doc. No. 408 (a), NA, RG 407.

4. Functions in Antiaircraft Defense

Information from Antiaircraft Intelligence Service Observation Posts was transmitted through the fire control system and reported direct to the Harbor Defense Command Post, which served as a consolidating agency for this type of information.

Fire control of the automatic weapons defense was exercised by the battery commanders.⁹

5. Role in Underwater Defenses

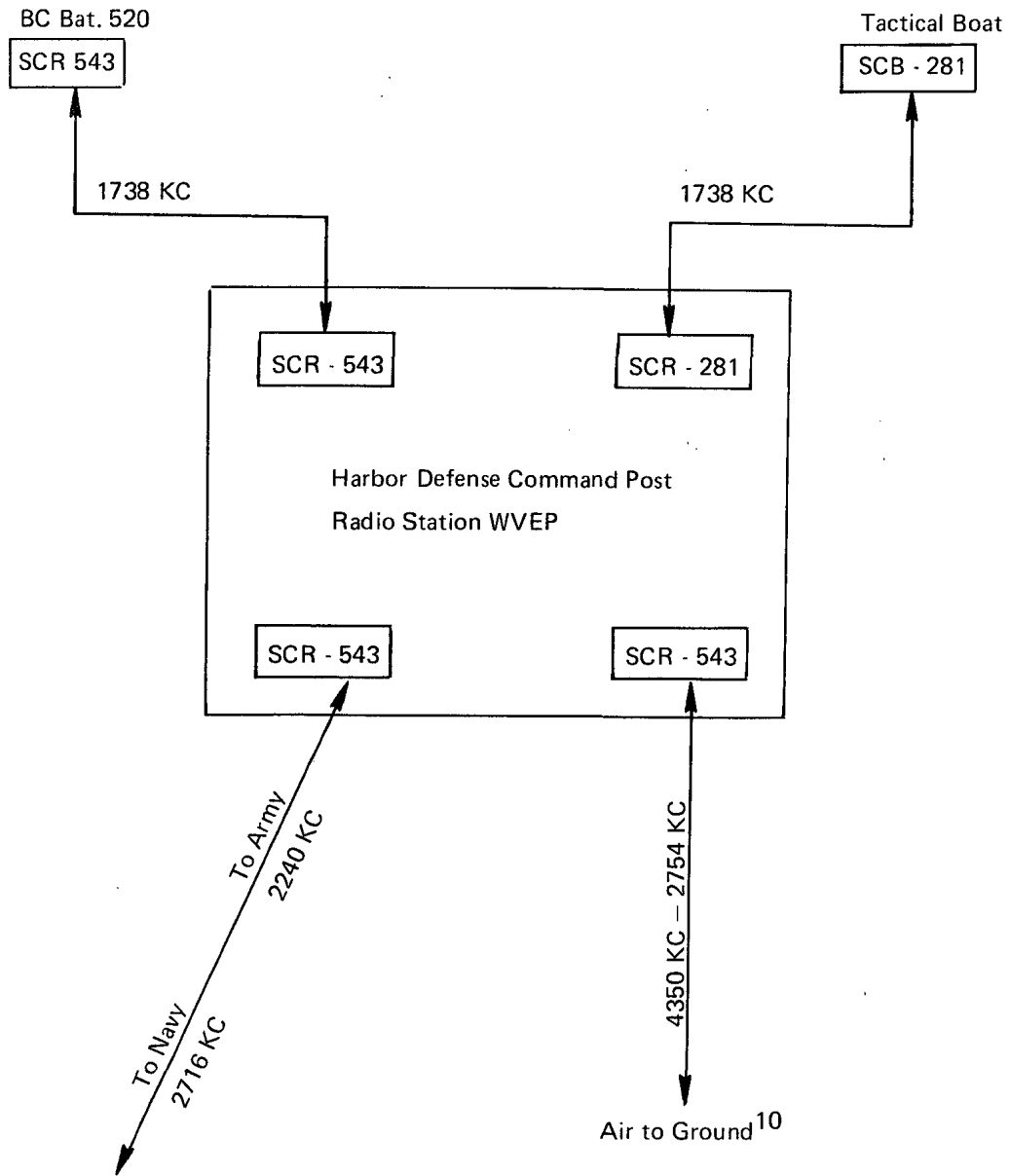
The Navy provided the only underwater defenses approved for Charleston Harbor, consisting of an anti-motor boat boom across the channel between North and South Jetties, approximately 100 yards to seaward of Buoy No. 16. This defense contained one main and one side gate and fixed obstructions to close the submerged jetty, openings to be located a short distance inshore from these jetties.

In compliance with paragraph 4, letter War Department, A.G.O., file AG 660.3 (9-29-42) OB-S-E, to Commanding General, Eastern Defense Command and First Army, dated October 20, 1942, subject: "Revision of Underwater Defense Projects," it had been recommended by headquarters, Eastern Defense Command and Sixth Naval District, that a mine project employing M-4 Type Ground Mines for the Harbor Defenses of Charleston be initiated. This project, however, was disapproved by action of the Joint Army and Navy Planning Committee, Eastern Defense Command and Eastern Sea Frontier, January 29, 1943.¹⁰

6. The Radio Communication Net

The radio communication net for the Charleston Harbor Defenses operated as follows:

9. Annex "E," Antiaircraft Artillery, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General's Office, AG Registered Doc. No. 408 (a), NA, RG 407.
10. Annex "C," Mission of Harbor Defenses, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General's Office, AG Registered Doc. No. 408 (a), NA, RG 407.



11. Annex "B," Mission of Harbor Defenses, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General's Office, AG Registered Doc. No. 408 (a), NA, RG 407.

V. STRUCTURAL HISTORY OF THE BUILDING 1948-1973

A. The Navy Establishes a Test and Calibration Facility

1. The Navy Renovates the Structure

The United States Army in 1948 abandoned the Fort Moultrie Military Reservation, turning it, including the historic old masonry fort, over to the State of South Carolina. Before doing so, however, the military removed the equipment belonging to the Navy and the Army Quartermaster, Signal and Engineer Corps, Ordnance Department, and Chemical Warfare Service from the combined HECF-HDCP. The building stood vacant from 1947 to 1953.

In 1953 the Navy leased from the State of South Carolina the combined HECF-HDCP and rehabilitated it for use as a Test and Calibration Facility. Employing plans and specifications prepared by personnel of the Sixth Naval District Public Works Office, a contractor made a number of improvements to the structure.

General work attended to by the contractor included: (a) thorough cleaning of "all existing asphalt tile through out" the structure, and regluing where needed. Where necessary, tile would be replaced. At this time the contractor learned that all rooms had asphalt tile floors, except the Front Corridor, Heater Room, Power Room, Air Lock, Air Conditioning Room, and Latrines (heads); (b) installation of new windows as indicated on the drawings and hardware for the same. Glass was to be one-quarter inch plate. He would also adjust all existing windows to good working condition, replace screens where missing, and repair existing screens; (c) verification that all interior wood doors on the ground floor had new lock sets and were "adjusted to good working condition." Door louvers would be replaced as indicated on the plans; (d) removal of all existing flush valves and faucets, replacing them with new fixtures. He would replace bubblers as shown on the drawing; (e) repainting the interior walls, ceilings, doors, and trim throughout the structure. The walls were to be patched as indicated on the drawings, and the nail holes filled. All new and existing windows were to be painted, the frames caulked, and the new wooden ladder giving access from the second floor to the roof of the signal tower to be dip treated and painted. Pipe railings on the roof and observation deck were to be painted.¹

Detailed work called for included:

Duty Officers' and Operations Room – removal of wood bulletin boards from south and west walls; removal of existing sheet metal from 7' x 12' map board and re-covering it with 76-gauge galvanized iron; renewal of existing wood door jamb on south door giving access to Center Corridor; and repair of four square feet of one-inch fiberboard wall finish in north west corner.

1. "Rehabilitation of HECF, Fort Moultrie, Sullivan's Island, S.C., Plans, Elevations and Details," files FSNM.

Message Center Room – replace 76 pieces of asphalt tile in northeast corner; and cover existing stud partition in southeast corner with one-inch fiberboard on both sides.

Center Corridor – adjust metal doors leading to Air Lock, Front Corridor, and outside.

HECP Room – re-nail four pieces of fiberboard ceiling; replace 24" x 22" wood louvers in doors giving access to Center Corridor and Radio Room; and cover existing stud partition with one-inch fiberboard on both sides.

Radio Room – repair existing 24" x 22" wood louver in door leading to Center Corridor; repair four square feet of one-inch fiberboard wall finish; remove wood radio cabinet, and stud and plywood partition; and repair asphalt tile.

North Entrance – adjust metal doors, and replace existing pair of screen doors.

Passage to Observation Post – replace existing screen door at head of stairs with 2'8" x 6'8" x 1 1/16" screen door.

Observation Post – replace existing asphalt tile on roof slab; hang new 2'8" x 6'8" x 1 1/16" screen door; and add new wood threshold.

Signal Tower – replace 50 percent of existing asphalt floor tile.²

2. The 1960 Improvements

In the summer of 1960 personnel from the Sixth Naval District's Public Works Office undertook a number of maintenance projects at the Test and Calibration Facility. Work accomplished included: (a) filling in two erosions; (b) constructing a new concrete foundation at base of existing antenna; (c) cleaning and painting three metal antennas; (d) cleaning and painting Observation Post handrails and stanchons; (e) cleaning and painting doors providing access to Signal Tower (Transmitter Room) and Observation Post (Main Communications Room); (f) removing old putty and re-puttying glass in five 3' x 1' 1/2" sash; (g) cleaning and painting exterior side of twenty-nine 3' x 1' 1/2" high wood sash (expanded metal existing on all sashes to be removed and not replaced and holes resulting in wood sashes to be wood plugged before painting. Existing plywood on five sash to be painted the same as other sashes.); (h) cleaning and painting exterior surfaces on three existing window air conditioners; (i) cleaning and painting wood steps leading to roof of Tower; (j) replacing existing handrail and stanchons on roof of Tower with 1 1/4" galvanized pipe and paint; (k) cleaning and painting metal handrail leading from Center Corridor to Observation Post; (l) cleaning and painting six 3'6" x 7'4" metal doors and frames; (m) cleaning and painting walls and ceiling of Center Corridor; (n) cleaning and painting metal duct near ceiling of Center Corridor; (o) cleaning and painting eight wood doors and trim on corridor side and installation of 1/4" plywood over 2'6" x 2'6" louvers on corridor side of three doors; (p) cleaning and painting walls and ceiling of Radio (Work) Room; (q) cleaning and painting two wood doors and trim on Radio (Work) Room side; (r) removing existing door lock from door giving access to Center Corridor from Radio

2. Ibid.

Room, plugging opening, and installing new lock set; (s) removing several remaining pieces of asphalt floor tile from Radio Room and installing new 9" x 9" asphalt tile over entire floor of room; (t) replacing eight pieces of broken asphalt floor tile in Center Corridor; (u) cleaning and polishing existing asphalt tile floor finish in Center Corridor and Latrines; (v) removing existing screen door and wood door frame from north entrance; and (w) installing 1" x 1" x 1/2" copper tee in existing water supply line at water closet in Latrine and connecting it to new 1/2" copper supply line which would run through existing hole in wall into Power Room and up with the riser through existing air intake to top, where hose bibb will be provided.³

3. The 1962 Improvements

In the winter of 1962, after the National Park Service had received title to old Fort Moultrie, personnel from the Sixth Naval District erected a six-foot chain link fence to the west of the Test and Calibration Facility. This fence, with its north post positioned at an angle on the Northeast Bastion of the old fort and its south on the edge of the Battery McCorkle blast apron, was to prevent visitors to the fort from wandering into the test facility. An existing fence guarded against unauthorized public access from outside the fort.⁴

The Navy made a change in the interior arrangements of two of the ground floor rooms in January 1962. The old Message Center Room (now the Pattern-Recording Room) was enlarged from 13 x 20 feet to 13 x 27 feet by relocating the partition at its south end. This move reduced the floor dimensions of the old Duty Officers' and Operations Room (now used for storage) from 13 x 36 feet to 13 x 29 feet. After completion of this project, two doors, not one, provided access to the Pattern-Recording Room from the Center Corridor.

At this time the Navy, on its plans of the structure, redesignated a number of other rooms: the HECF Room became the Dehumidified Storage (Spare Parts), the Radio Room became the Workshop, the Air Conditioning and CWS Room became the Mechanical Equipment Room, the Power Room became the Emergency Generator Room, the Officers' Latrine became Toilet No. 1, the Enlisted Men's Latrine became Toilet No. 2, the Observation Post became the Main Communications Room, and the Signal Tower became the Transmitter Room. Five rooms (Air Lock, Heater Room, Coal Bin, Front Corridor, and Center Corridor) retained their designations.⁵

3. "Repairs to Test and Calibration Facility, Sullivan's Island, S.C., June 17, 1960," files FSNM.
4. "New 6' Chain Link Fence at Electronics Facility - Fort Moultrie Reservation, Sullivan's Island, S.C.," Jan. 11, 1962, files FSNM.
5. "Fort Moultrie Test and Calibration Facility (formerly Harbor Entrance Control Post), May 1964," files FSNM.

4. Changes Necessitated by a New Air Conditioning System

In 1963 a new air conditioning system was installed on the ground floor. The contractor in carrying out the project made a number of changes to the fabric of the structure. Among these were: (a) new 24" x 22" louvers for the doors to Mechanical Equipment and Pattern-Recording Rooms; (b) several new sections to ductwork; (c) a square sheet metal box was secured to concrete ceiling of Mechanical Equipment Room; (d) the five-inch pipe leading from the old air intake to Mechanical Equipment Room was cut out, the pipe in the walls was used as sleeves for suction and liquid lines; (e) the existing diffuser was relocated in the Pattern-Recording Room and equipped with a short radius elbow with turning vanes; (f) an air handler, vertical model 1700 CPM, 36,000 BTU was installed in the Mechanical Equipment Room; (g) a condensing unit, air cooler, 36,000 BTU, and 24-inch four-blade fan propeller were positioned in the area formerly occupied by the air intake scavenging fan; (h) a 1P-20A breaker box was added to existing load center; (i) new one-half inch conduit was run up the wall and over the south Pattern-Recording Room door to existing conduit; (j) new wires were extended through existing one-half inch conduit and led across Center Corridor; and (k) the existing one-half inch conduit running down east side of Center Corridor was cut and replaced with new conduit of the same dimension, which continued down wall about 20 inches and then through the subject wall.⁶

B. The National Park Service Takes Over

The Navy in 1970 relocated their Test and Calibration facility in a new brick structure atop Construction No. 230. The National Park Service took over the vacated combined HECP-HDCP as administrative offices for Fort Sumter National Monument, vacating their quarters in the Fort Moultrie bombproofs and principal magazine.

A few minor changes to the building and grounds were made by National Park Service personnel. These included:

1. To the ground floor: (a) painted entire interior; (b) changed door locks to National Park Service system; (c) removed generator from Power Room to Fort Sumter for use in emergencies; (d) replaced broken tile in library (formerly the Duty Officers' and Operations Room); (e) carpeted library and office area (formerly the Message Center Room); (f) installed storm door between Center Corridor and Escape Passage; (g) finished wall between library and office; (h) removed toilet stools from Enlisted Men's Latrine and stored them in Construction No. 230; (i) replaced light fixtures in maintenance room (Radio Room), library, and office; (j) installed fire catch; and (k) painted steps and walls of Escape Passage.

6. "Air Conditioning Installation at S.E.S.E.F., Sullivan's Island, S.C., April 1963," files FSNM.

2. Observation Post (Administrative Office): (a) painted entire interior; (b) removed concrete block for the Azimuth, M1910 A1, near southeast corner; (c) covered floor with indoor-outdoor carpet; (d) replaced gas heater with electric heater, but did not change support brackets; (e) installed additional electric wall outlets; (f) installed burglar alarm system; and (g) installed window curtains and rods.

3. Signal Tower (Superintendent's Office): (a) removed concrete block from southeast corner; (b) covered floor with indoor-outdoor carpet; (c) painted entire interior; (d) replaced "old window type air conditioner" with new unit; (e) positioned tile on ceiling; (f) installed storm door; (g) installed new light fixtures; and (h) positioned curtains and rods.

4. Exterior and Grounds: (a) removed chain link fence separating the HECP-HDCP grounds from Fort Moultrie; (b) relocated wooden walkway from east side of grounds to west slope to protect grade approaching entrance to the Observation Post; (c) removed and stored ladder providing access from Observation Deck to roof of Signal Tower; and (d) removed for storage the two C.W.S. Intakes and supporting guy wires.⁷

7. Memos from Superintendent William Harris, Chief of Interpretation and Resource Management J.M. Dennis, and Chief of Maintenance Mel Baker to Bearss, Oct. 18, 1973.

VI. THE U-BOAT OFFENSIVE IN AMERICAN WATERS

A. Admiral Doenitz Redeploys His U-boats

With the end of the "undeclared war" with the Third Reich, an early attack by U-boats on United States coastal shipping was anticipated by the U.S. Navy. German submarines had crossed the Atlantic in World War I to singe Uncle Sam's beard. The six U-boats which had crossed the Atlantic between April and November 1918, while causing an uproar, had failed to disrupt coastwise shipping or cause the retention in home waters of ships slated for duty in Europe. Their operations were little more than nuisance raids. Most ships attacked were small defenseless vessels, cables were cut, and mines were laid off our harbors which claimed several victims, including a cruiser. Twenty-four ships ranging from 2,000 to 10,000 tons and 26 smaller craft, mostly schooners or fishing boats, were sunk by gunfire or torpedoes off the United States coast.¹

Until Pearl Harbor, the German submarine command was operating under orders laid down by Chancellor Adolf Hitler in his September 17, 1941, meeting with Admiral Karl Doenitz. At this conference Hitler had reiterated previous instructions that "all incidents with the United States were to be avoided." Brief mention, however, was "made of the situation that would arise, from the point of view of U-boat operations, if the United States was drawn into the war." Admiral Doenitz stated that if the United States were to be "drawn in," he would appreciate timely notice to enable him to redeploy his submarines to have a number off the American coast before war was declared. In this way his U-boat commanders would be able to take the maximum advantage of surprise to hit hard, while anti-submarine defenses were weak.

This was not to be. The German High Command, like the United States, was surprised by the Japanese attack on Pearl Harbor. On December 7, 1941, "there was not a single . . . U-boat in American waters." Two days later, on the 9th, and 48 hours before the Third Reich declared war on the United States, the chief of the German Navy, Grand Admiral Erich Raeder informed Admiral Doenitz that "all restrictions placed on U-boat operations against American ships or operations in the Pan-American security zone had been removed by Hitler." Before the day was over, Doenitz had asked Naval High Command to release 12 submarines for operation "*Paukenschlag*" (Drumbeat) off the coast of the United States.²

1. Samuel Eliot Morison, *The Battle of the Atlantic, September 1939 - May 1943* (Boston, 1954), pp. 125-26.
2. Karl Doenitz, *Memoirs: Ten Years and Twenty Days*, translated by R. H. Stevens in collaboration with David Woodward (Cleveland, 1958), p. 195.

Admiral Doenitz and his staff expected much of these 12 boats. Pan-American waters had heretofore been forbidden to them. In them, merchantmen, including those bound for Halifax and Sydney, Nova Scotia, where the great North Atlantic convoys formed, sailed independently. Although the British and United States navies had been cooperating and exchanging information, Admiral Doenitz and his U-boat commanders anticipated that with no "practical experience," United States forces would "not be very efficient" in coping with a submarine offensive in their home waters. This advantage would, they knew, gradually disappear.

The appearance of U-boats in the Western Atlantic would cause the United States to strengthen their defenses, and these, with experience, would become increasingly more effective. Most shipping would cease to sail independently, and the convoy system would be introduced on coastwise routes. It was therefore mandatory to strike at once with all available force, before the United States could perfect its defenses.

The number of submarines available to Admiral Doenitz for his offensive was limited. In November and December battles with the Royal Navy and Air Force off Portugal and in the Denmark Straits had cost Germany a number of submarines. On January 1, 1942, the Third Reich accordingly had 91 U-boats operational. Of this figure, 23 were in the Mediterranean, with three more under orders to proceed there. Six were stationed west of Gibraltar, and four were operating off the Norwegian coast. Of the remaining 55, 60 percent were in dockyards undergoing repairs.

To begin operations off the American coast, Admiral Doenitz had asked for 12 boats. But this figure was vetoed by Naval High Command. To secure the 12 boats, Doenitz had requested the return of six large type IXC boats (740 tons) which Naval High Command had stationed west of Gibraltar. Naval High Command, however, did not feel justified in weakening its forces in the Mediterranean or withdrawing the vessels west of Gibraltar. Admiral Doenitz was left with only six submarines with which to strike his first blow off the coast of the United States. Of these only five were ready to put to sea from the Bay of Biscay U-boat pens. They set sail between December 16 and 25.³

These craft were the big type IX boats, with a sufficient fuel capacity to enable them to cross the Atlantic and remain on station for two to three weeks. Each boat carried 14 torpedoes, including several of the new electrical driven type that emitted no telltale air bubbles, and consequently could not be seen or avoided. They were also armed with guns of sufficient caliber to sink most merchantmen. As Doenitz and his staff were of the opinion that the shipping to be attacked would not be convoyed, the

3. Ibid., pp. 195-98; Morison, *The Battle of the Atlantic*, pp. 125-27.

U-boats would not operate as a wolf pack but independently. The area of operations, as identified by Admiral Doenitz,

must not be so small that, if enemy shipping in it were stopped or diverted, a number of U-boats would simultaneously be robbed of the chance of any action; on the other hand it must not be so big that the boats, being scattered, would not be able to threaten wide areas and would be unable to exploit to the full the opportunities if offered.

In addition, Doenitz was "anxious to confine my first blow to an area in such a way that when we first appeared in it the enemy would be unlikely to expect us to put in an appearance soon afterwards at some other focal point." After studying these factors, Admiral Doenitz selected as the theater of his first strike the area between the Gulf of St. Lawrence and Cape Hatteras.

To insure surprise, the five U-boat captains were to keep out of sight as they crossed the North Atlantic to the east coast of North America. While enroute, no ships under 10,000 tons were to be attacked. The captains would receive from Doenitz by radio the time and date at which they were to simultaneously go into action. This would be dependent on the "weather and time taken by the individual boats to reach the zone of operations."⁴

U-boat Command meanwhile had been working to get Admiral Raeder to release additional U-boats to send across the Atlantic. On December 24 Admiral Doenitz prevailed on Naval High Command to sanction the transfer of the six boats stationed west of Gibraltar to the Azores. One week later, on January 2, 1942, Admiral Raeder gave Doenitz a free hand to deploy his forces as he saw fit, subject to several limitations – the transfer of two or three more boats to the Mediterranean and retention of several boats between Gibraltar and the Azores.

By mid-January, a second wave of Type IX boats were ready to put to sea from Bay of Biscay bases. With the first five approaching the east coast of the United States, Doenitz determined to employ this second group for a surprise blow in the Caribbean against the Aruba-Curacao-Trinidad area.

A study having shown that the medium-size type VII c boats (517 tons) could reach the Nova Scotia shipping lanes, with sufficient fuel to remain there a reasonable period, Doenitz diverted seven of them, currently enroute to the Gibraltar-Azores area, to that sector.⁵

4. Doenitz, *Memoirs*, pp. 197-99.

5. *Ibid.*, pp. 199-202.

By January 10, 1942, U-boat Command knew that the first five boats would be off the North American coast by the 12th, and a coded radio message went out to begin attacks on that day.⁶

B. The Offensive Begins

1. The U.S. Navy Prepares for the U-boats

On the entry of the United States into World War II, headquarters of the Eastern and Southern Sea Frontiers initiated three "general measures" to protect coastal sea lanes. All available air and surface craft took up patrol of the areas assigned them in the war plans. An inshore patrol around "particular focal points" off important harbors was instituted, but the implementation of an offshore patrol by the Navy had to be deferred, because of lack of multiengine patrol airplanes capable of carrying out long overwater flights. The Army Air Corps undertook this responsibility for the Navy, with flights out over the Atlantic from Westover, Mitchell, and Langley fields. From each of these bases, planes roared out over the Atlantic twice a day.

The second measure consisted of mining the approaches to New York Harbor. Incoming vessels were notified to secure directions for "safe passage from patrol vessels stationed off Ambrose Channel Entrance." Throughout the remainder of December 1941, "the system of mines, booms and nets, designed to augment the controlled fields already laid by the Army were extended and strengthened." On December 19 special warning No. 140 was issued advising all ships and stations that "a mined area covering the approaches to Chesapeake Bay had been established." All vessels entering the Bay were to take aboard pilots. The next day, the 20th, Chief of Naval Operations H. R. Stark expressed a desire to increase the protection afforded by laying fields of contact mines at the entrance to Chesapeake Bay, and the approaches to Boston and Portland harbors. This was done on the 23d.⁷

Finally, to guard against attacks by German U-boats, Rear Admiral Adolphus Andrews, the 62-year-old Texan who commanded the Eastern Sea Frontier, issued orders concerning coastwise shipping in areas that might be dangerous. The purpose was twofold — it was hoped that along selected sea lanes it would be possible to direct merchant ships through waters "least accessible" to U-boats, while the narrow lanes themselves would greatly reduce the area to be patrolled and protected by the Navy with its limited resources. In July 1941 such routes had been established for vessels in the overseas trade, and later that month lanes had been established for ships sailing

6. Ibid., p. 202.

7. War Diary, Eastern Sea Frontier, Dec. 7-31, 1941, Chapter III, pp. 16-17, Operations Archives, Naval History Division, Washington, D.C.; Morison, *The Battle of the Atlantic*, pp. 126-27, 130.

between New York and Halifax. On December 16 a routing plan was put into operation by Chief of Naval Operations Stark for coastal shipping.⁸

2. The Establishment of Joint Operation Centers

Admiral Andrews also activated a Joint Control and Information Center for his Eastern Sea Frontier. This facility extended to an entire Frontier many of the concepts and features found in the combined HECF-HDCPs of the Harbor Defenses.

Five months before on July 9, 1941, the commander, North Atlantic, Coastal Frontier, had proposed to the commander of the Army's Northeast Defense Command, the organization of a Joint Control and Information Center to be located on the 14th floor of the Federal Building at 90 Church Street, New York City. In his letter, Admiral Andrews wrote, "the area suggested combines adequate space, centrally located, with close proximity to present Naval communication installations, as well as convenient accessibility to various types of land communication channels."

At the proposed center there would be present Army liaison officers, who with representatives of the Navy, would work closely on defense problems of mutual interest. Such liaison, it was believed, would be of value in expediting action connected with questions relating to sub-sector defense, as well as decisions in matters pertaining to the Army's Northeast Defense Command and Naval Coastal Frontiers.

The proposal was accepted by the Army, and plans for establishment of the Joint Control Center pushed. On the 14th floor of the Federal Building, next to headquarters of the North Atlantic Naval Coastal Frontier, space was reserved for the Army. Here there were offices for the Northeast Defense Command and the First Air Force, a message room, center room, coding room, and telephone room.

The Navy likewise had a telephone switchboard for command telephones, a teletype room, and a large operations room. Along the walls of the latter, charts of the Atlantic and North Atlantic Naval Coastal Frontier were positioned.

In general terms the mission of the center was to "maintain a running estimate of the military situation in the theater of operations by means of plotting information on operating charts and maps and maintaining a digest of unplotable material." On the charts the following data was plotted: (a) positions of merchant shipping travelling off the coast, corrected hourly; (b) positions of all surface patrol vessels, corrected hourly; (c) positions of all air patrols operating on the coast, positions to be corrected every 30 minutes; and (d) enemy operations and contacts, including air warnings received from the Army Air Corps Regional Filter Center.

8. War Diary, Dec. 7-31, 1941, Chapter III, p. 17, Operations Archives, Naval History Division, Washington, D.C.

The purpose of the plotting was to assist "in determining what forces are available" to engage the foe in any eventuality, and to provide duty officers with sufficient information to enable them to take "swift and decisive action." All intelligence from every source (patrols, observation stations, the forces afloat, and Harbor Entrance Control Posts) was channeled into the Joint Operations Office and there digested to such form that the men on duty could act upon it. The importance of such centers for joint control and information was recognized in Washington. On December 31, 1941, Chief of Naval Operations Stark and Chief of Staff Marshall sent a letter to all commanders of Coastal Frontiers urging the rapid establishment of Joint Operation Centers. It was observed that "commendable progress in approaching this ideal has been made in the North Atlantic Naval Coastal Frontier, where a Joint Operation Office has been established and in the various Coastal Frontiers, where joint Harbor Entrance Control Posts have been placed in operation."⁹

3. The U-boats Strike

The first attack came on January 12, 1942, when the British passenger steamer *Cyclops* was torpedoed and sunk 300 miles east of Cape Cod by *U-123*, Lieutenant Commander Hardegen. Two days later, enemy submarines invaded the shipping bottleneck off Cape Hatteras. The Panamanian tanker *S.S. Norness* was sunk on January 14; the British tanker *Coimba* on the 15th; the American tanker *Allan Jackson* on the 18th. The next day one of the Canadian "Lady boats," the American cargo ship *City of Atlanta*, and a small Latvian freighter were sent to the bottom. Next three tankers in succession were sunk and three more before the end of the month, all in the coastal lanes between New York Harbor and Hatteras.¹⁰

The commanders of the five U-boats constituting the first wave of "Paukenschlag" reported conditions "almost exactly those of normal peace-time." There was no blackout, and the coastal cities and towns were a blaze of lights. "Lights, both in lighthouses and on buoys, shone forth." Shipping followed normal peacetime routes and carried the usual lights. Although the United States had been at war for five weeks, few anti-submarine measures had been introduced. There were anti-submarine patrols, but they were woefully inexperienced. Single destroyers cruised the coastal traffic lanes with "such regularity that the U-boats were quickly able to work out the time-table being followed. They knew exactly when the destroyer would return, and the knowledge only added to their sense of security during the intervening period." There were a few depth charge attacks, "but the attackers did not display the requisite perseverance, and the attacks were abandoned too quickly, although thanks to the

9. War Diary, Eastern Sea Frontier, Mar. 10 to Dec. 7, 1941, Chapter II, pp. 6-15, Operations Archives, Naval History Division, Washington, D.C.

10. Morison, *The Battle of the Atlantic*, pp. 130-31.

shallow water, they had a good chance of succeeding." Crews of airplanes assigned to coastal patrols likewise were inexperienced.

Merchantmen employed their radios without any restrictions. They frequently reported their positions, which enabled Admiral Doenitz's captains to "form a very useful" overview of the shipping in the area. It was apparent to the Germans that the merchant marine had received no instructions regarding the methods of attack the U-boats would employ. No consideration had evidently been given to the possibility of night attacks.

Within a few days the U-boat captains had adopted a "very effective routine." By day they would rest on the bottom at depths from 150 to 450 feet and a few miles from the shipping lanes. At dusk they would approach the coast submerged and, when darkness closed in, would surface in the middle of the lane to deliver their attacks by night.

Successes reported by the first five U-boats of "*Paukenschlag*" were great. *U-123* (Lieutenant Commander Hardengen) listed eight ships (53,360 tons) sunk, including three tankers; *U-66* (Lieutenant Commander Zapp) sank five ships (50,000 tons) of which two were tankers and one a large ore-carrier; *U-130* (Lieutenant Commander Kals) bagged three tankers and one freighter; while the toll taken by the other two boats was equally impressive.

Before these five boats left the operational area off the coast of the United States, three more big class IX submarines arrived off Chesapeake Bay. These had departed the Bay of Biscay submarine pens in mid-January.¹¹

The smaller VII c submarines diverted from the Azores to the Nova Scotia-Newfoundland area did not fare so well. The weather was terrible. "Fog, driving snow, heavy seas and cold interfered gravely with operations and led to a number of misses and torpedo failures."

Under these conditions, only minor successes were scored. Nor was it possible to transfer these vessels to more favorable waters to the southwest off the coast of the United States, because they had been sent to the Western Hemisphere from the Azores area and had accordingly used up many hundreds of gallons of fuel to get on station.

The next group of Type VII c boats dispatched from the Bay of Biscay ports were therefore ordered to the area south of Halifax. From there, they worked their way southwest as far as New York City and Cape Hatteras.¹²

11. Doenitz, *Memoirs*, pp. 202-03.

12. *Ibid.*, p. 204.

C. The Offensive Continues into February

1. An Administrative Change

On February 4, 1942, in an effort to cope with the U-boat offensive, the North Atlantic Naval Coastal Frontier was enlarged by transfer of the Sixth Naval District from the Southern Naval Coastal Frontier. Charleston, South Carolina, and Fort Moultrie were in the Sixth Naval District. Henceforth the boundary between the North Atlantic Naval Coastal Frontier and the Southern Naval Coastal Frontier would pass from the seaward side of the line dividing St. Johns and Duval counties, Florida, southeastward to a point in Latitude 25 North and Longitude 72 West. Three days later Secretary of Navy Frank Knox ordered the North Atlantic Naval Coastal Frontier redesignated the Eastern Sea Frontier, and stated that the new command would embrace two forces: (a) the sea frontier force comprising ships and aircraft allotted by Commander in Chief United States Fleet Ernest J. King; and (b) local defense forces comprising ships and aircraft allotted to the component naval districts by Chief of Naval Operations Stark.¹³

By this administrative change, Secretary Knox had made Admiral Andrews, a White House favorite, responsible for much of the new war zone. This zone involved shipping lanes which began at the St. Lawrence, debouched into the Atlantic by Cabot Strait, skirted the coast of Nova Scotia, and passed outside Georges and Nantucket Shoals to New York Harbor, where it was joined by vessels from New England that had navigated the Cape Cod Canal and Long Island Sound. From New York, the greatest port in the world in 1941-42, the coastal shipping lane passed south to Cape Hatteras, with feeders leading up into Delaware and Chesapeake Bays, and onto Florida. There one branch went through the Straits of Florida to the Gulf of Mexico, and another through the Bahama Channel to the Windward Passage, where it met the shipping lane used by the New York to Panama Canal trade. Many ships also entered the Caribbean through Mona Passage. In addition, there was considerable traffic from New York to Cape San Roque, enroute to Brazil, South Africa, and the Rio de la Plate. The faster ships on the West Indies-Great Britain run had deserted the convoyed routes in the fall of 1941 to save time and escape foul weather. Few of these ships, except the British, Dutch, and Norwegian, were armed. Even then, few of the armed guards assigned to merchantmen were a match for Doenitz's well-drilled submarine gun crews.¹⁴

2. The U-boats Up Their Score

February commenced as January had ended, with the German submarines exacting a heavy toll. During the first five days of the month, six vessels were sent to

13. War Diary, Eastern Sea Frontier, Feb. 1942, Chapter II, pp. 1-3, Operations Archives, Naval History Division, Washington, D.C.

14. Morison, *The Battle of the Atlantic*, p. 127.

the bottom within the Eastern Sea Frontier. The rate of sinkings dropped during the next two weeks, as the first five U-boats left the new war zone and returned to their bases, but not sufficiently to give any grounds for "confidence that the situation was under control." Then in the final week of the month, the foe returned to the attack, sinking four ships in two days, including the destroyer *Jacob Jones* torpedoed by *U-578* off the Delaware Capes.

The tactics of the submarines changed little in the course of the month. Attacks continued chiefly at night, with the U-boats operating on the surface. Gunfire, remarkable for its accuracy, was frequently employed to supplement torpedoes. Toward the end of February, a slight, though discernible shift of activity to the southwest was observed, an indication that the next month might witness an increased intensity of submarine warfare off the coasts of South Carolina, Georgia, and Florida.

Reports had been received by Admiral Andrews that the submarines were being supplied from merchantmen, flying the Portugese flag, stationed off the Atlantic seaboard. Such reports were unconfirmed, "but there is no real reason," he reported, "to doubt that some such vessel does exist." Intercepted radio messages had also led to the belief that Germany was receiving sailing dates before the merchant ships sailed.¹⁵

Admiral Andrews was correct in part. The U-boats were undoubtedly assisted by enemy agents and clandestine shortwave broadcasts from the United States. Germany had also succeeded in "busting" the code used by the United States and the British until about mid-1942, when "we changed it so fast that German cryptographers could not keep pace."¹⁶

Total sinkings for February reached 14, which at first glance represented a satisfactory reduction from the 13 vessels sent to the bottom in the last 17 days of January. But when the figures were studied, they gave scant cause for comfort. Ten of the ships were lost in the first five and the last two days of the month. It was believed, correctly, at headquarters Eastern Sea Frontier that those vessels sunk by submarines at the beginning of February had fallen victim to U-boats enroute back to their Bay of Biscay bases, while the increased activity at the end of the month was caused by the arrival of newcomers in the Western Atlantic.

15. War Diary, Eastern Sea Frontier, Feb. 1942, Chapter II, pp. 1-3, Operations Archives, Naval History Division, Washington, D.C.

16. Morison, *The Battle of the Atlantic*, p. 128.

Admiral Andrews warned Washington that the situation could be worse in March. According to the best estimates, there were from four to seven submarines operating off the east coast from Newfoundland to the Caribbean.¹⁷

3. Groping for a Solution

a. The Proposal for Contact Minefields

In the years before Pearl Harbor, plans had been matured for "development of a system of passive defense for our coast line." Ways to coordinate activities of the Army and Navy had been devised. Submarine nets and booms had been manufactured, and sites for minefields identified. During the months before Pearl Harbor, minefields had been laid in the more important harbors. After the nation's entry into the war, the "entire system of passive defense was expanded." Nets and booms were emplaced, obstructions of all kinds placed across harbor entrances, and the area of existing minefields increased and new ones positioned farther out to sea. What form of direct action the foe would take was unknown, but if the lessons of World War I and II were a guide, it was feared that Axis submarines and possibly motor torpedo boats and four-engine bombers would soon make their appearance off the east coast.

By New Year's Day 1942, two weeks before the U-boats of "*Paukenschlag*" arrived, plans had been made and steps taken to provide more substantial means of defense than had heretofore existed. On January 15 an ambitious mining program was decided upon in Washington. Next day Chief of Naval Operations Stark proposed that "naval contact mines be placed between Cape Cod and Cape Ann." It was planned to begin this project on or about February 1, and complete it by the end of the first week of March.

A shortage of patrol vessels and minesweepers delayed the beginning of the operation until February 20. Because of foul weather, Admiral Andrews on the 16th was compelled to report that the "present estimate for commencing the beginning of the minefields is now March 1, 1942." High winds, freezing temperatures, and rough seas were not the only difficulty, as there was a problem in obtaining the prerequisite shipping.

The delay in sowing the Cape Cod-Cape Ann minefield added weight to the arguments of those in Washington opposed to laying extensive minefields. As a result of these deliberations, Admiral King on February 21 recommended to Chief of Naval Operations Stark that the subject of laying contact mines in the waters of the Eastern Sea Frontier be reconsidered because: (a) it had been established that the purpose of

17. War Diary, Eastern Sea Frontier, Feb. 1942, Chapter II, pp. 1-3, Operations Archives, Naval History Division, Washington, D.C.

the subject minefields was defensive; and (b) defense against submarines was a complex and many faceted subject, every aspect of which must be carefully weighed.

In the first place, Admiral King continued, all available data indicated that the "constant offensive action" maintained by British forces against the U-boat menace, both from the air and sea, had kept them several hundred miles off the coasts of the United Kingdom. If such a result could be obtained by "constant offensive action," he reasoned, "there was no immediate need for contact mine fields across the approaches to our harbors." Second, the minefields would require protection and patrol. Vessels needed for this purpose would have to be diverted from the essential task of protecting shipping lanes and searching out and destroying enemy submarines. It was accordingly determined to delay laying the contact minefields.¹⁸

b. The Struggle for More Patrol Aircraft

Throughout February the Navy struggled to find additional forces to commit to the battle. The lessons of World War I, when David Lloyd George in April forecast that unless the United States Navy could provide "ships, ships, and more ships," German submarines would bring "England to her knees in August," was on everyone's mind. But the fact remained that when the United States entered the war, it lacked the strength afloat to defend its merchant shipping.

Admiral Andrews, whose Eastern Sea Frontier now extended from the Canadian border to Jacksonville, Florida, had had no naval patrol aircraft at his disposal in December capable of searching far out to sea. Offshore air patrols were at first undertaken by the Army Air Corps. Late in January planes of the Fleet Air Arm at Norfolk were made available to the Eastern Sea Frontier. As these were the only ones within the Frontier capable of maintaining an effective patrol offshore, they were called on for arduous service, "particularly when it is realized that the flight personnel engaged were largely inexperienced and in training status."

This arrangement, however, proved unsatisfactory. Cinclant (Commander-in-Chief, Atlantic Fleet) held that such duty "seriously interfered with the fleet aircraft training program," at a time when there was a shortage of pilots as well as of planes. The assignment of planes from Norfolk to temporary duty under Eastern Sea Frontier also raised the problem of distribution of aircraft between the various commands. This was settled by Admiral King on January 31, when he informed Cinclant that a shortage of patrol planes had been recognized and would be solved by delivery of 42 PBys over the next three months. Until then Eastern Sea Frontier would continue to look for assistance to the Fleet Air Arm.

18. War Diary, Eastern Sea Frontier, Feb. 1942, Chapter IV, pp. 1-6, Operations Archives, Naval History Division, Washington, D.C.

On February 3, as a temporary expedient, Eastern Sea Frontier suggested that some of the 40 PBys at Elizabeth City, North Carolina, be assigned to it. These craft, it was understood, were grounded, because the British to whom they belonged lacked pilots to man them. Chief of Naval Operations Stark poured cold water on this scheme with the announcement that "RAF aircraft urgently required by the British are being fitted with long-range tanks and equipped for ferry to the British Isles as expeditiously as material can be made available."¹⁹

February began without much promise that the situation would improve. One possible source of assistance remained. On January 14 Eastern Sea Frontier recommended to Admiral King that "when armed naval aircraft for long-range patrol are available, a sufficient number be assigned to the Coast Guard, in lieu of the unarmed obsolete equipment currently being used by that service for offshore patrol." The subject Coast Guard units having had naval training were "exceptionally competent to carry out Frontier offshore patrol," it was observed.

Replying on January 31, the Commandant of the Coast Guard informed the Navy that personnel under his command were not being used to advantage. He recommended that 46 additional aircraft be assigned to Coast Guard bases throughout the country.

One week later, the Chief of the Bureau of Aeronautics approved his recommendation, and suggested that 40 OS2U-3s be assigned to Coast Guard stations as soon as possible. Chief of Naval Operations Stark on February 9 took further action by ordering that these planes be assigned to the east coast instead of being dispersed throughout the nation as initially planned. On the 13th orders were issued assigning the OS2U-3s on their arrival to five fields from Salem, Massachusetts, in the north to St. Petersburg, Florida, in the south.²⁰

c. Efforts to Increase the Number of Patrol Vessels

Afloat little could be done to augment the available forces, because the prerequisite ships did not exist. Temporary expedients were resorted to. On February 7 Admiral King informed Eastern Sea Frontier, "you are authorized by the Chief of Naval Operations to employ at sea anywhere within your Frontier . . . any or all of the 70- and 80-foot" Coast Guard cutters normally assigned to local defense forces.

19. War Diary, Eastern Sea Frontier, Feb. 1942, Chapter 3, pp. 1-2, Operations Archives, Naval History Division, Washington, D.C.

20. Ibid, pp. 2-4.

Four days later, Admiral Andrews ordered, "Arm, equip, and provide with depth charges" all the subject Coast Guard cutters. As many depth charges as practicable were to be carried. Guns were to consist of 1-pounders, 50 caliber machine guns, and whenever possible 3-inch rifles. Listening gear was to be installed as it became available. The armed cutters were to be assigned to patrol of the coastal sea lanes.

On February 17 Eastern Sea Frontier followed up this dispatch, with a request for a plan to operate the cutters in each Naval District.

Mid-February brought a promise of help from an unexpected source. Admiral King notified Eastern Sea Frontier that 24 armed trawlers were about to sail from Great Britain enroute to St. John, New Brunswick. These vessels and their combat-tested crews were under orders from the British Admiralty to assist the United States fleet in its anti-submarine campaign.

Admiral Andrews on January 23 had recommended to Chief of Naval Operations Stark that at least one destroyer, equipped with listening gear, be based at Hampton Roads to help cope with the foe at this point of greatest danger. This was approved. By the end of the month, *U.S.S. Roe* was assigned for temporary duty to the Fifth Naval District. During the first week of February, with U-boats operating off Cape Hatteras, a request was made for the immediate assignment of two destroyers to Com Five for "temporary duty in view of the critical situation in the vicinity of the Virginia Capes." Two days later, six additional destroyers (*H.P. Jones, Ludlow, Wainwright, Myrant, Rowan, and Tripps*) were made available to Eastern Sea Frontier. By mid-February three of these destroyers were operating on anti-submarine patrol off the Virginia Capes, while one had been ordered north into Fourth Naval District waters. Worldwide commitments had by the fourth week of the month resulted in orders sending the seven destroyers to Iceland, as escort to an important convoy.²¹

It was just as well. Both Admiral Doenitz and Naval Historian Samuel E. Morison scoffed at Admiral Andrews' attempt to use destroyers for anti-submarine patrol. This method had failed in World War I, when President Wilson called it "hunting the hornets over the farm." A typical anti-submarine patrol was that of *U.S.S. Hambleton* and *Emmons*. At 6 p.m., April 1, they sailed from New York, steaming southward several miles to the seaward of the coastal shipping lanes. Next afternoon, a Norwegian freighter, in sight a few miles ahead, signaled that she had spotted two U-boats. The destroyers speeded up and were fired on by a "square head" gun crew, who had mistaken them for the enemy submarines.

21. Ibid, pp. 4-7.

After dark the destroyers hailed and searched two suspicious-looking craft, which were found to be friendly. Next they received a submarine-sighting report from a United States tanker and searched the area, but made no contacts. They then patrolled the area between Wimble Shoals and Cape Lookout, receiving numerous reports of U-boats and logging many miles in fruitless searches. On April 5, at 2:28 a.m., they received a message that S.S. *Bidwell* had been torpedoed. They reached the position 40 minutes later, searched the area until daybreak, but made no contacts. At this stage of the conflict no scientific method of search to regain sound contact with a submarine existed. If visibility were good, an alert U-boat commander could sight a destroyer long before her sound gear registered, and easily evade her, especially off Cape Hatteras, where deep water lay close to shore. United States destroyers at this stage of the conflict were so ill-fitted for search, and the crews so imperfectly trained for attack, that to employ them as a roving patrol was worse than useless.²²

d. A Shortage of Escorts Prevents Convoying Coastal Shipping

Admiral King on February 12 directed the commander, Eastern Sea Frontier, "to submit a plan for a convoy system to protect coastal shipping." When he questioned the commandants of the Naval Districts for which he was responsible, Admiral Andrews received replies indicating in varying degrees their opposition to the immediate introduction of a convoy system. In most instances these opinions were based on the "limited capacity" of the defense forces assigned to their districts.

After reviewing the replies, Admiral Andrews composed his thoughts on the subject. These he forwarded to Washington on February 26. The course of action recommended involved five factors: (a) the number and speed of vessels requiring protection; (b) availability and capability of ships to be used for escorts; (c) availability and characteristics of airplanes to be employed for air coverage; (d) the safest routes to be used; and (e) the question of compelling certain merchantmen now routed to the seaward to use coastal lanes. Three of these problems were involved with the "arithmetical factor" which lay at the heart of the submarine problem.²³

In assessing the value of immediately instituting the convoy system for coastal shipping, it was necessary to weigh the number of ships to be protected against the number of ships and planes available for escort duty. At the moment, the average

22. Morison, *The Battle of the Atlantic*, pp. 134-35; Doenitz, *Memoirs*, p. 202.

23. War Diary, Eastern Sea Frontier, Feb. 1942, Chapter IV, pp. 1-2, Operations Archives, Naval History Division, Washington, D.C.

number of ships which daily moved southward through shipping lanes, for which the Frontier was responsible were:

(a) from Cape Cod to New York, via Long Island Sound	13
(b) from New York to the Delaware Capes	18
(c) from the Delaware Capes to Cape Henry	20
(d) from Cape Henry to south of Charleston	15
Total	68

The average number of northbound merchantmen was about the same. Thus the daily average of ships requiring protection within the Frontier was between 120 and 130.

To protect these vessels, Admiral Andrews had nine ships, exclusive of the *Eagles*, with a speed of 14 knots or better. He had another 19 ships with a speed of between 12 and 14 knots, and this group included ten 125-foot Coast Guard cutters, five *Eagle* boats, three PYs, and one 165-foot slow Coast Guard cutter. This gave the Frontier only 33 vessels that could be used for convoying, and if these craft were assigned exclusively to this duty, the entrances to harbors would be stripped of naval protection.

The number of airplanes was likewise limited. On February 7 Admiral Andrews had observed that, except for the patrol bombers of the Fleet Air Detachment at Norfolk, there were no long-range naval patrol planes in the Eastern Sea Frontier capable of maintaining a constant patrol offshore and able to give adequate protection to merchant shipping. The only naval planes attached to the Frontier were single-engine craft, with limited range.

In view of the large number of merchantmen that would have to be convoyed and the limited number of ships and planes available, Admiral Andrews urged that no attempt be made to protect coastwise shipping by convoying, until such time as a suitable number of escort craft were on hand.²⁴

As an interim measure, Admiral Andrews recommended:

- (a) Every possible use be made of the inland waterway.
- (b) Ships be routed as close inshore as safe navigation permitted, with schedules so arranged that special danger points were passed in daylight.
- (c) Coastwise shipping lanes be vigorously patrolled.
- (d) If the foe abandoned his present mode of offshore sinkings to penetrate the inshore lanes, daylight runs between such points as New York, the Delaware Capes, and Cape Hatteras be instituted, with patrol vessels concentrated off Hatteras.

24. Ibid, pp. 3-5.

- (e) All merchantmen including overseas shipping to and from the West Indies, South America, and Capetown, be routed along the coastal lanes, as escort vessels would not be available for ships routed offshore.
- (f) Convoys to be inaugurated on the Cape Cod to Halifax run.

Coastal convoys were to be introduced if these measures proved inadequate.²⁵

Orders were accordingly issued implementing these stopgap measures.

D. The Germans Increase the Pressure

1. The U-boats Invade the Caribbean

In mid-February five type IX U-boats, having previously arrived on station, commenced offensive operations in the Caribbean. These vessels encountered heavy tanker traffic and claimed numerous victims. After sinking two tankers, *U-156* surfaced and prepared to open fire on an Aruba Tank Farm. The first shell, however, exploded in the gun, and the submarine was compelled to break off the attack. Admiral Doenitz by radio ordered the attack resumed on the following night. But when *U-156* returned, she found that the coastal lights had been extinguished, and it was difficult to pinpoint targets. A second boat which sought to bombard the tank farms on another night was forced to retreat by patrol vessels.

Shipping reacted quickly to these attacks, much more so it seemed to the Germans than had been the case off the coast of the United States. It first ceased and was then rerouted. Air patrols were stepped up. Admiral Doenitz countered by radio, giving his five captains "complete freedom of action." Whereupon *U-129* headed for the Guiana coast; *U-161* boldly penetrated the harbors of Port of Spain and Castries; and *U-126* took position between the Windward Passage and the Bahama Channel. An impressive number of ships were sunk, and like the first, this second attack on shipping in American home waters was a resounding success.²⁶

Although several U-boats were sent by Doenitz in February to war on shipping plying the routes from South America and Capetown west of the African bulge, the "profitable areas off the American coast remained... the principal theatre of operations." From mid-March until the end of April 1942, Admiral Doenitz had only between six and eight submarines "to take advantage of this pre-eminently favorable situation," the failure of the United States Navy to begin convoying coastal shipping and the inexperience of the defense forces.

25. Ibid, pp. 5-6.

26. Doenitz, *Memoirs*, pp. 212-13.

U-boats which crossed the Atlantic during these six weeks found good hunting. They kept close inshore, starting from New York and running southward. The captains quickly worked out the sailing schedules followed by shipping at night. The Cape Hatteras area was particularly fruitful. In an effort to avoid the submarines, the shipping here kept in shoal waters close to the shore. But this did not deter the daring U-boat commanders, who delivered their attacks at night in waters not more than four or five fathoms in depth. At these depths, they could not have dived if sighted by enemy escort vessels or patrol aircraft. *U-123* on her second voyage to the Western Hemisphere, sank several tankers in shoal Sixth Naval District waters northeast of Savannah. Before returning to her base from her second foray in American water, *U-123* destroyed another seven ships. Other submarines reporting impressive kills were: *U-124*, nine, and *U-552*, *U-203*, and *U-160*, five to six each.

In addition to this decisive area close inshore, good hunting was chanced upon by *U-105* about 300 miles east of Cape Hatteras. *U-105* had encountered exceptionally foul weather in crossing the Atlantic, which had slowed her passage to the point where it was feared she would have insufficient fuel in her tanks to remain on station an appreciable time in the shoal waters off Hatteras. The captain, Lieutenant Commander Schewe, therefore took station 300 miles offshore and found that he had lucked upon the junction of three shipping lanes. This area proved very profitable to Schewe and his crew, and it was exploited subsequently by other U-boats, especially during the full moon, when inshore operations were too hazardous.²⁷

2. The March Attacks as Seen by Eastern Sea Frontier

Admiral Andrews and his staff at Eastern Sea Frontier reported that U-boat activity had ebbed off the Atlantic seaboard during the first week of March. Not a sinking was reported in the first seven days. But during the next two weeks of March, the submarines returned to the attack with a vengeance. Twenty-one ships were sent to the bottom. The worst 24 hours were on the 16th, when four vessels were lost, followed on the 18th when three were sunk. From then to the end of the month, sinkings diminished, but as March ended, sinkings averaged one a day.

The mode of attack and area of warfare remained unchanged. Cape Hatteras with its deep water close inshore remained a favorite haunt, with an estimated three submarines constantly lurking thereabouts, with perhaps four to six U-boats cruising the rest of the waters for which Eastern Sea Frontier was responsible. Eastern Sea Frontier, even in its confidential reports, was exaggerating the number of U-boats operating in the war zone for which it was responsible.

27. Ibid, pp. 213-15.

It was concluded, incorrectly, that the submarines now entering the Frontier, unlike their predecessors, instead of sweeping southwest down the coast from Newfoundland, were conning a course directly for Cape Hatteras. Perhaps, the staff at Eastern Sea Frontier reasoned, the greater security afforded shipping between Hatteras and New York by introduction of daylight runs, broken by a nighttime layover at either Delaware or Chesapeake Bays, was responsible.

Changes in sea lanes had been instituted and ship sailings were now cloaked in secrecy. On March 5 Chief of Naval Operations Stark had ordered merchantmen to discontinue the practice of hoisting flags as they were about to sail. The following week it was suggested that wherever possible ships should depart port after dark.

Fears were expressed at headquarters that the lights burning in coastal cities and towns were unwittingly assisting the U-boats by silhouetting the shipping against the skyline. On March 4 in a conference in Washington, it was agreed that it was the Navy's responsibility to correct this situation. Accordingly, on March 14 the Chief of Naval Operations issued a directive suggesting a "dimout" of coastal lights. A blackout was rejected, because, it was argued, a "suppression of lights showing to seaward" would reduce sufficiently the glare against which shipping was outlined.²⁸

The March onslaught disrupted shipping schedules, eroded the morale of merchant seamen, and caused insurance companies to cease writing policies on cargo vessels. With losses for March equalling the combined totals for January and February, hope that the Third Reich would be unable to sustain an offensive along the Atlantic coast faded. Since the sinking of *Cyclops* on January 12, 53 ships, totalling more than 300,000 tons, had been destroyed in the war zone protected by Eastern Sea Frontier.

To those in the plotting room, it was evident that since the first of the year, Admiral Doenitz had shifted the focus of his operations from the North Atlantic to the coastal waters of the United States and the Caribbean. Efforts to meet this threat by rerouting shippings, daylight sailings, and patrols and searches had not been successful. Persons familiar with submarine warfare realized that the danger could only be dealt with by superior force. But there were never enough destroyers, smaller escort craft, and patrol aircraft.²⁹

28. War Diary, Eastern Sea Frontier, Mar. 1942, Chapter I, pp. 1-3, Operations Archives, Naval History Division, Washington, D.C. Two months later, on May 18, the Army's Eastern Defense Command ordered a stringent dim-out along the Atlantic seaboard.

29. War Diary, Eastern Sea Frontier, Mar. 1942, Chapter II, pp. 1-3, Operations Archives, Naval History Division, Washington, D.C.

3. Eastern Sea Frontier Changes and Regulates Routes

In the weeks immediately after the United States went to war, shipping routes had been established, lying on either side of a reference line passing through lightships and other aids to navigation along the Atlantic coast. Until January 21 these lanes provided a "pattern for north- and southbound coastal shipping." On the 22d these routes, in face of U-boat attacks, were modified to carry the vessels 60 miles offshore and to avoid the critical areas of Diamond and Wimble Shoals.

When this change failed to reduce losses, the "whole system" of sea lanes was changed on January 31 to bring shipping in "as close to the shore as safe navigation" permitted. All vessels were directed to sail at night along these routes without navigation lights.³⁰

Lessons learned in February demonstrated that ships plying these tracks were assured of increased protection against submarines, but the slight distance now separating northbound and southbound shipping, coupled with the need to darken ship, increased the chance of collision. Although few collisions took place, fear of accidents was so great that captains frequently refused to follow the assigned routes. On a given day in the Sixth Naval District more than one-half of the 30 ships sailing the coastal routes were found to be off their prescribed course. It was accordingly determined to again use the sea lanes.³¹

On February 25 Admiral Andrews informed Chief of Naval Operations Stark of the problem, and suggested that it might be alleviated if the northbound and southbound shipping were separated by a two-mile-wide belt of water. Such action would reduce the danger of collisions, and encourage the independent-minded merchant masters to participate in the scheme. This proposal was approved on March 6 in Washington, and necessary orders issued; thus preserving the safety factor inherent in having the coastal sea lanes skirt the shore line as closely as safe navigation permitted.³²

Admiral Andrews on March 12 advised Washington of additional steps recently taken to increase the security of coastwise shipping. Experience had demonstrated that shipping hugging the coast, during daylight hours, on the Hatteras-New York run was reasonably safe from attack. Two reasons were given for this: (a) the shallow water

30. War Diary, Eastern Sea Frontier, Mar. 1942, Chapter IV, p. 1, Operations Archives, Naval History Division, Washington, D.C.

31. Ibid, pp. 1-2.

32. Ibid, pp. 2-3.

limited the efficiency of the submarines; and (b) daylight afforded a better opportunity than night for efficient operation of air and surface patrols. Orders had been given to route ships along this part of the coast only by daylight. At night, shipping was to lay over in protected anchorages at Chesapeake and Delaware Bays. Thus the principle of the broken voyage was introduced.³³

On March 12 Chief of Naval Operations Stark adopted another of Admiral Andrews' suggestions. Northbound ships on the South America-West Indies run were to regulate their passage so they would fall into the route from Hatteras to New York at an hour to enable them to navigate this dangerous coast by daylight.³⁴

4. A Shortage of Vessels and Aircraft Hamstrings Plans for Convoying

Throughout March preparations continued looking toward the day when sufficient escort craft would be available to institute a convoy system for coastal shipping. In discussions, the severity of losses was constantly emphasized.

The commander of Task Force 21 suggested that an alteration of the cycle for the Halifax and Sidney convoys from six to seven days would release sufficient escorts to make available two groups for service along the Atlantic Coast, provided "lack of escort vessels is holding up inauguration of North Atlantic Seaboard Coastal convoys." The intimate relationship of submarine warfare in Eastern Sea Frontier to world shipping was suggested by this proposal. It was dropped, when found that the opening of the Halifax and Sidney convoy cycle by one day would reduce imports to the British Isles by 30,000 tons a month.

Reviewing the problem on March 7, Admiral King found that the convoy system was the most effective method of protection that could be employed against U-boats. But, he recognized, that its introduction must await the "accumulation" of sufficient escort craft. In absence of such vessels, it was determined to continue the methods adopted by Eastern Sea Frontier on February 25, while investigating the type of organization that should be implemented when the time came to begin convoying.

By the end of March a plan had been developed. It, however, involved use of 31 destroyers and 47 corvettes or PCs. But at this time, there were assigned to the Frontier three destroyers on temporary duty, no corvettes, and only three PCs and five SCs.³⁵

33. Ibid, p. 3.

34. Ibid.

35. War Diary, Eastern Sea Frontier, Mar. 1942, Chapter V, pp. 1-7, Operations Archives, Naval History Division, Washington, D.C.

Even so, the number of vessels and aircraft available to Eastern Sea Frontier was being increased. On March 11 the Army Air Force made available to the Sixth Naval District for patrol duty: at Wilmington three B-25s; at Charleston four B-25s and nine observation planes; and at Jacksonville three B-25s. The B-25s would fly daily three patrols, at daybreak, midday, and dusk. While on patrol they were armed with depth charges and 50-caliber machine guns. The Charleston observation planes patrolled the coast from Wilmington, North Carolina, to Brunswick, Georgia, four times daily. They were armed with 30-caliber machine guns and 250-pound demolition bombs.³⁶

Throughout the entire Frontier the antisubmarines air patrol by April 1, 1942, had been increased to 84 Army and 86 Naval aircraft based on 19 fields between Bangor, Maine, and Jacksonville, Florida. While by this date the number of surface patrol craft responsible to Admiral Andrews included 23 large (90-foot and up) and 42 small (75- and 83-foot) Coast Guard cutters, three 173-foot PCs, 12 old *Eagle* boats and converted yachts, and 14 armed British trawlers. The latter rugged little coalburners, manned by aggressive ex-merchantmariners, were of great help.³⁷

5. The Sinkings Erode the Merchant Marine's Morale

Three months of submarine warfare off our Atlantic seaboard had tested the courage of the merchant seamen. The ability to take vessels through waters where shipmates had been killed and where "the masts of sunken ships stand as warning tombstones is apparent, but the other qualities required of crews and masters" had received less publicity. To keep station in convoy, to follow routing instructions, to sail as close inshore as safe navigation permitted, required a skill and knowledge not ordinarily needed in the merchant marine. In addition, hundreds of restrictions and regulations had to be followed by men used to freedom of the seas.

By late March it was proving difficult to recruit adequate and efficient personnel. One chief mate complained of the "usual troubles . . . they all got drunk in port and were hard to handle." As weeks passed, the crews were not only difficult to control, but they became hard to find. After a voyage, one captain complained, "it is impossible to keep a good crew on board; that in making his homeport, he lost 13 of a crew of 30." Another master expressed the opinion that unless the Navy forced personnel of tankers to sail, shipping would stop, and he would end up in a morgue. While this was too jaundiced a view, there was little doubt that the "constant shifting of crews and shortage of qualified merchant seamen were sources of great concern."

36. War Diary, Sixth Naval District, Mar. 1942, Operations Archives, Naval History Division, Washington, D.C.

37. Morison, *The Battle of the Atlantic*, p. 131.

A board appointed by the oil industry to investigate the situation, called attention to the problem. But, it admitted, its solution could only come with increased protection for the tankers and men. The shortage of manpower was felt particularly among licensed personnel, especially engineers, who could easily find good paying jobs ashore.³⁸

6. March Antisubmarine Activities in the Sixth Naval District

In the first week of March, the local defense force for the Sixth Naval District was divided into an offshore and inshore patrol. The former included *PY 21, Ruby*, and the Coast Guard cutters *Agassiz* and *Tallapoosa*, and the latter *PY1, Emerald*, and the YPs *21, 24, 32, 216, and 217*. For towing and salvage there was *Umpqua*.³⁹

On March 11 *U.S.S. Bellatrix*, upon arriving in Charleston Harbor, reported that about five miles southwest of the harbor entrance buoy, a torpedo wake had passed the ship on a parallel course.⁴⁰

On March 25 eight of the British trawlers reported for duty at Charleston, and were employed by Sixth Naval District to reinforce the offshore patrol. Included were: *Lady Rosemary, Welland, Cape Warwick, Le Tiger, Northern Chief, St. Cathan, Northern Isles, and Northern Duke*. These vessels were of sturdy construction, displaced about 500 tons, were 180 to 200 feet long, drew 18 feet, and made about 12 knots. Each was armed with one 4-inch gun, one 50-caliber machine gun, two depth charge racks, and two depth charge projectors. All were equipped with asdic antisubmarine echo ranging apparatus. This gear indicated visually on a recorder the range of the object contacted, and, on a magnetic compass, the bearing of the object.⁴¹

7. April Brings no Relief

a. Admiral Andrews Reaches Some Erroneous Conclusions

At sea, April was a repetition of March in the waters of the Eastern Sea Frontier. Twenty-four ships of 138,121 tons were sunk. Once again, the Eastern Sea Frontier was the most dangerous area in the world for merchant shipping. Of the 73

38. War Diary, Eastern Sea Frontier, Mar. 1942, Chapter VII, pp. 1-7, Operations Archives, Naval History Division, Washington, D.C.

39. War Diary, Sixth Naval District, Mar. 1942, Operations Archives, Naval History Division, Washington, D.C.

40. Ibid.

41. Ibid.

ships sent to the bottom by enemy submarines in April, 33 percent were lost in the Eastern Sea Frontier; 17 ships or 23 percent of the world total in the mid-Atlantic; and the remaining 32 sinkings scattered over the rest of the oceans.

The pattern of sinkings remained the same. Thirteen vessels went down in the first ten days of April, followed by two weeks of reduced activity. By the end of the month, the tempo of sinkings was again climbing. This led Admiral Andrews and his staff to conclude correctly that in mid-April, the submarines that had crossed the Atlantic and arrived off our coast in late March had been compelled by fuel shortages to return to their Bay of Biscay bases.⁴²

There was also little change in the method of attack, the submarines preferring to operate at night. Gunfire frequently was used in lieu of torpedoes. Cape Hatteras continued to be the favorite haunt, although toward the end of the month, there was a slow shift southward. Men plotting the attacks observed that this was a continuation of a trend. From the beginning of submarine warfare off the coast at Montauk in January, this gradual movement had continued.

Admiral Andrews and his people had difficulty gauging the number of U-boats operating in the waters of Eastern Sea Frontier at any one time. Their best estimates placed the number between five and eight.⁴³

Many at headquarters continued to believe that Axis agents and sympathizers were assisting the U-boats. Such aid, they argued, included refueling the submarines at isolated anchorages along the coast; radioing information about ship departures; and meeting the U-boats at sea in small craft filled with provisions and fuel. There were rumors of neutral and German supply ships off our coast. Efforts to verify these reports were unsuccessful.

But still there was the circumstantial evidence. In the third week of January five U-boats had passed Bermuda headed toward the Caribbean. During the next two weeks, submarines were reported off the Florida coast and in the Gulf of Mexico, but there were no attacks in these waters until mid-February, when several tankers were sunk off Aruba. The next several days saw U-boat attacks in the waters around Martinique and Trinidad. It was assumed correctly that these attacks had been made by the submarines that had passed Bermuda more than three weeks before, and accordingly that they had been refueled and their crews rested somewhere in the western Caribbean.

42. War Diary, Eastern Sea Frontier, Apr. 1942, Chapter I, p. 1, Operations Archives, Naval History Division, Washington, D.C.

43. *Ibid*, pp. 1-2.

This situation had been repeated recently. In the last week of March, six U-boats had entered the Caribbean from the northeast, but during the first week of April no attacks were reported from that area. Then in the second week of April, three submarines were sighted off the coasts of Georgia and Florida. Admiral Andrews and his staff mistakenly concluded that these vessels came from the Caribbean, after a period of "rest and reprovisioning."

This opinion was reinforced by the presumed capabilities of the 740-ton Type IX U-boats, which could cross from the Bay of Biscay to Hatteras in 17 days. They could then remain on station for only nine days, before returning to their bases. If the U-boat captain elected to make a sweep through the Caribbean and up the coasts of Florida and Georgia, the days he could operate off our coast would be reduced from nine to five days. To Admiral Andrews five days out of a cruise of 43 days would be a luxury Admiral Doenitz could not afford, and he would have to have some means for extending the days on patrol.

Admiral Andrews therefore concluded that the enemy submarines were "possibly" rendezvousing with tankers, flying neutral flags, and operating out of Columbian, Venezulean, and Mexican ports. It was "equally possible," they could be using some small island, such as Corn, for a base. It was recommended on April 24 that a search be made of the smaller islands off the coasts of Nicaragua and Honduras, and that all small tankers be stopped and checked.⁴⁴

b. Refueling the U-boats in the Western Atlantic

Admiral Andrews and his staff, however, had underestimated the dedication and resourcefulness of the officers and men of the U-boat service. In their eagerness to raid in American waters, crews sought every means to facilitate operations. They filled some of the drinking water and washing water tanks with fuel. They, on their own volition, "sacrificed many of the amenities of their living quarters . . . to make room for larger quantities of stores, spare parts and other expendable articles which an increase in the radius of action demanded." Even in normal circumstances German U-boats were much less comfortable to live in than the submarines of other nations, because they had been built on the principle that "every ton of their displacement must be used solely in fighting power." Now, however, the crews voluntarily gave up such "comforts" as they had, and jammed their boats "as full as it was possible to cram them." For weeks on end the bunks were stacked with cases of foodstuffs. Often there was barely space for a man to sit, either in the forward or the after compartments. It was only possible to get about the boats via the narrow gangways between stacked cases.⁴⁵

44. Ibid, pp. 2-4.

45. Doenitz, *Memoirs*, p. 205.

Instead of neutral tankers, the Germans in April began employing submarine tankers (milch cows) to support the offensive. The first one of these, *U-459*, was a great, clumsy boat of nearly 1,700 tons. She was not intended for combat, and accordingly carried no torpedo armament and mounted only antiaircraft guns for her own protection.

Of the 700 tons of fuel oil carried, she could make available from 400 to 600 tons, according to the length of her own voyage, for operational U-boats. This meant that if 12 medium-sized boats each received 50 tons from the milch cow, they would be able to extend their operations into the farthest reaches of the Caribbean.

On April 22 *U-459* rendezvoused with *U-108* 500 miles northeast of Bermuda and carried out her first refuelling mission. Within a fortnight 12 medium Type VII boats and two large Type IX boats had been refuelled by the milch cow. *U-459* was then "sold out" and returned to her home port. During these refuelling operations, interruptions and delays because of foul weather were unavoidable. This resulted in there sometimes being several boats at the rendezvous on the same occasion, all awaiting their turn. Such a concentration was hazardous, and caused Admiral Doenitz a certain amount of misgivings.⁴⁶

The milch cows, however, were vital to the operations of the 500-ton Type VII boats, which constituted the majority of those operating along the coast of the United States, as they carried only enough fuel for a cruise of 42 days. Allowing two weeks for the outbound passage from the Bay of Biscay and a similar period for the homeward voyage, without the milch cows they could spend only two weeks raiding the Atlantic coast shipping lanes.⁴⁷

c. Admiral Andrews Sees Some Hope

What especially disturbed our military leaders was that the Germans had been able to successfully maintain their campaign. This success was traced to several factors, but the most important was the failure of the United States to challenge it with sufficient force. The outlook for May, Admiral Andrews warned, was grim, though the pessimism should be tempered by recognition that ships and planes were slowly being accumulated along the Atlantic coast, and "a protective system of considerable strength had been devised for the merchant ships in our coastal waters."⁴⁸

46. Ibid, p. 219.

47. Morison, *The Battle of the Atlantic*, p. 129.

48. War Diary, Eastern Sea Frontier, Apr. 1942, Chapter I, pp. 3-4, Operations Archives, Naval History Division, Washington, D.C.

8. The "Bucket Brigade"

Throughout April preparations for instituting a convoy system continued in Eastern Sea Frontier. Escorts were designated, schedules drawn up, and administrative machinery perfected. But these preparations were only academic, because of the limited number of escorts available. If all went according to plan, it would be mid-May before shipping using coastal sea lanes would be convoyed.

The continued high rate of sinkings, however, called for emergency measures.

Cape Hatteras continued to be the critical area. Because of the narrowness of the continental shelf at this point, U-boats were able to operate close inshore. Steps to cope with this situation had been taken in March, with the directive requesting merchantmen to proceed from Cape Lookout to Chesapeake Bay in daylight. By night shipping would lay over in protected anchorages.⁴⁹

On April 14, 1942, Admiral Andrews wrote the Commandant of the Fifth Naval District, directing that all ships now "sailing independently" between Cape Lookout and Chesapeake Bay be organized into convoys. The system as implemented was labeled the "bucket brigade." Under it merchantmen put into Cape Lookout at night. Usually between 12 and 20 vessels could be expected to take refuge in the subject anchorage, which, pending the laying of a mine field, was guarded by patrol vessels equipped with listening gear, depth charges, and guns.

Next morning the ships were formed into a column. Vessels unable to maintain a speed of nine knots or capable of making more than 13 knots were permitted to sail independently. Escorts comprised one slow vessel, to lead the convoy, while three faster craft patrolled to the seaward and in rear of the convoy. Whenever a destroyer was available, it was added to the escort.

Forty vessels, including twenty 83-foot Coast Guard cutters, assigned to the Fifth Naval District constituted a pool from which the escorts were drawn.

Admiral Andrews, while admitting that this plan utilized "practically all available patrol vessels" in the District, felt that by a concentration of shipping and patrol vessels, "the best possible protection will be gained."

On April 22 the Fifth Naval District Commandant notified Admiral Andrews that the "bucket brigade" was "practically in effect," as all northbound ships were being escorted from Cape Lookout, and all southbound traffic was provided with air

49. War Diary, Eastern Sea Frontier, Apr. 1942, Chapter III, pp. 1-2, Operations Archives, Naval History Division, Washington, D.C.

coverage. It was, however, impossible to introduce the system as proposed by Admiral Andrews, because neither ships nor men were available in sufficient number to implement the plan.⁵⁰

9. The Loss of the Trawler "St. Cathan"

One of the Sixth Naval District escorts was lost in April. On the 11th the British trawler *St. Cathan* collided with the steamship *Hebe* at 33° 10' North Latitude and 78° 17' West Longitude. Struck on the starboard quarter by *Hebe*, *St. Cathan* foundered in less than five minutes. *Hebe* also went to the bottom but more slowly. Only nine of the 39-man crew of the armed trawler were rescued, while only three were lost from the merchantman.⁵¹

E. The Americans' Defense Improves

1. Admiral Doenitz Shifts the Theatre of Operations

By mid-April 1942, it was apparent to Admiral Doenitz and his staff that "the routing of shipping and the anti-submarine measures in the immediate vicinity of" the Atlantic coast of the United States "were becoming more efficient." Shipping was now passing Cape Hatteras only during daylight and at different distances from shore. The number of ships sailing independently had decreased. A tendency for "the ships to sail together in batches," was observed, with the result "that, when one batch passed, the sea remained empty for a long while until another group of ships passed through — but this time on a different course, invisible to the waiting U-boats." This made it more difficult for the submarines to locate shipping, and their problems were complicated by the end of April by a noticeable increase in the number of patrol vessels and aircraft engaged in antisubmarine activities designed to drive the U-boats from their coastal haunts.

These measures — the rerouting of shipping and strengthening of patrols — were not "effective enough to cause U-boat Command any grave concern." Admiral Doenitz therefore determined "to continue operations in American waters, meeting the changes in the situation as they occurred with appropriate tactical counterstrokes."

The United States having seemingly concentrated its antisubmarine forces off the Atlantic coast, Doenitz now decided to employ all U-boats becoming available for operations from the end of April "onwards in a simultaneous attack on a number of other, and widely separated, focal points for shipping off the American coast." By this means, he would compel the foe "to split up and scatter his defensive forces,

50. Ibid, pp. 2-7; Morison, *The Battle of the Atlantic*, pp. 134-35.

51. War Diary, Sixth Naval District, Apr. 1942, Operations Archives, Naval History Division, Washington, D.C.

withdrawing considerable portions from the concentrations, he had just established off the east coast . . . to protect other important areas which would now be equally threatened."

During May 16 to 18 medium-sized Type VII boats ranged between Cape Sable and Key West. Nine operated in the area between the Bahama Channel and the Windward Passage, in the Gulf of Mexico, to the south of Cuba as far as Yucatan, and in the Caribbean off Curacao, Aruba, and Trinidad.⁵²

At the end of April, U-boat sinkings off the Atlantic coast stopped. As there was a full moon, Doenitz hoped that the dark nights which would follow "would restore the situation and that the sinkings would regain their previous high level." Instead, there was a steady increase in signals from U-boats reporting no ships sighted. This indicated to Admiral Doenitz that U.S. Naval authorities had finally introduced a convoy system in their coastal waters. In view of the unfavorable conditions off the east coast and an increase in sinkings in the Caribbean, U-boat Command transferred six boats from the former to the latter, and diverted four submarines enroute from the Bay of Biscay pens to the Gulf of Mexico. Two more milch cows, *U-116* and *U-460*, joined *U-459* to fuel U-boats engaged in the Caribbean offensive.⁵³

2. The Tide Turns

No ships were lost in Eastern Sea Frontier during the first 17 days of May, and in the final two weeks only four were sent to the bottom. This "startling turn of events was not, however, reflected in other areas of the Atlantic," where 123 ships were lost to U-boats. Submarines had carried their campaign of destruction into the Caribbean and Gulf of Mexico with a vengeance. Whereas in April only 15 vessels had been sunk in those waters, 80 went down in May.⁵⁴

In May there was an increase in the forces available to Eastern Sea Frontier. One hundred additional destroyer days were added to the April total, while the numerical increase in larger patrol boats and aircraft was 20 percent. With these forces Admiral Andrews and his subordinates maintained a constantly mounting offensive against the U-boats.

52. Doenitz, *Memoirs*, pp. 115-16, 218-19.

53. *Ibid*, pp. 220-21.

54. War Diary, Eastern Sea Frontier, May 1942, Chapter I, pp. 1-2, Operations Archives, Naval History Division, Washington, D.C.

During the month there were in the Frontier 59 sightings, 19 contacts, and one submarine, *U-352*, sunk off Cape Lookout on May 9. This vessel was destroyed by *Icarus*, which rescued and landed 31 survivors in Charleston on the 10th.⁵⁵

Mid-May found the forces of Eastern Sea Frontier finally inaugurating a coastal convoy system. While this afforded greatly increased security to merchantmen, it in itself would not explain what had occurred in May. First, it was apparent that Admiral Doenitz's U-boats were now raiding the Caribbean and Gulf of Mexico sea lanes. This however, did not mean that they had entirely abandoned the waters of Eastern Sea Frontier. Reports reaching headquarters correctly indicated that more enemy submarines were prowling the waters of the Frontier than heretofore, with daily estimates placing the number at six to eight, and on some days as many as 11 off the Atlantic coast. In addition, the distribution of the enemy craft had seemingly changed. In April operations had been limited to the area from Cape Hatteras south into the Sixth Naval District, but now they were deployed up and down the coast and had penetrated the Gulf of Maine.

But there were some factors that were difficult to explain. Although there had been a great increase in patrol craft and airplanes, the number of sightings and contacts reported was not appreciably higher than in April. Moreover, the four sinkings had occurred after the inauguration of the convoy system on May 15. To what could the improved situation in Eastern Sea Frontier be attributed? Besides the increased resources to combat the submarines and to implement the convoy system, it was believed that luck had played its part. Until May luck had seemingly run against Admiral Andrews and his people, but now it appeared to favor them by "upsetting the calculations of an enemy who had sent more submarines to the Frontier in May" than heretofore.⁵⁶

3. The Coastal Convoy System Begins

On May 11 Admiral Andrews informed the Commandants of the Naval Districts constituting Eastern Sea Frontier that success of the proposed convoy system between Key West and Hampton Roads depended to a large degree on the efficiency of the convoy organization, i.e. "the protection given to shipping by the fighting forces could be no stronger than the system of administration controlling the activities of the vessels at sea." Numerous factors complicated the task: (a) the separate links of three convoy systems extending from Key West to Hampton Roads had to be integrated; (b) the

55. War Diary, Eastern Sea Frontier, May 1942, Chapter IV, pp. 1-10, Operations Archives, Naval History Division, Washington, D.C.

56. War Diary, Eastern Sea Frontier, May 1942, Chapter I, pp. 1-4, Operations Archives, Naval History Division, Washington, D.C.

operations of ships and planes allocated to the five Naval Districts had to be brought into "efficient harmony"; and (c) at either extremity of the chain of protection, it would be necessary to provide adequate cooperation with separate and independent activities. The southern terminal (Key West) was under jurisdiction of the Gulf Sea Frontier, while the northern waters were the responsibility of the British.

To these were added a host of minor problems. It was necessary to develop facilities for anchorages, inspection, and assembly at many ports along the Atlantic seaboard. Personnel had to be recruited and indoctrinated. Schedules had to be devised which would allow the limited forces available to operate in the most efficient fashion. In certain areas provision had to be made for cooperation between the Army, Air Force, Navy, and Coast Guard.⁵⁷

The most important problem during the first two weeks of May was preparation of the convoy system to protect vessels between Key West and Hampton Roads. On May 2 Admiral Andrews had drafted plans for air protection for the route. Daylight coverage would be provided at all hours, when weather and forces permitted; night coverage would be provided only after adequate day protection was assured. Particular attention would be given to a search of the convoy routes immediately after daybreak and just before sunset.

A schedule for search and patrol was established. Convoys departing Hampton Roads would be protected the first day by planes from Langley Field, Norfolk, and Elizabeth City, North Carolina; the second day by aircraft from Cherry Point at daylight, and from Wilmington and Charleston thereafter. On the third day planes from Charleston would cover the coast as far as Jacksonville, Florida, where they would land. On the fourth day the patrolling force would take off from Banana River, Florida, and on the fifth day from Miami. Aircraft from each of these bases would make two flights – one in the morning and one in the evening. Those from Banana River and Miami would be controlled by the Gulf Sea Frontier, while those from the other bases were to look to headquarters, Eastern Sea Frontier, for their orders.⁵⁸

Surface protection would be provided by six escort groups. Each was to consist of seven vessels – preferably including two destroyers, one corvette, two PCs, and two trawlers. One group from which replacements could be drawn for vessels undergoing extended repairs would be held in reserve.

57. War Diary, Eastern Sea Frontier, May 1942, Chapter IV, pp. 1-3, Operations Archives, Naval History Division, Washington, D.C.

58. *Ibid*, pp. 3-5.

From Hampton Roads, at three-day intervals, convoys consisting of a maximum of 45 vessels would head south. A convoy would steam north from Key West at similar intervals for Hampton Roads. To reduce confusion at the terminal points, schedules were staggered to permit incoming convoys to arrive a day before the departure of outgoing vessels.⁵⁹

Having arranged schedules on which the convoys were to sail and having provided for surface and air coverage within the capabilities of the limited forces available, Admiral Andrews' staff matured plans for the composition of each convoy. On May 5 Andrews informed all interested parties of the priorities for inclusion in the coastal convoys. The following preferences would be given: (a) Regarding United States owned and controlled tankers, those southbound would be evaluated on an equal basis with British tankers routed in that direction; (b) Northbound convoys were to accord a higher priority to British tankers enroute to Halifax; and (c) Vessels traveling at less than eight knots or more than 14 knots were not to be convoyed and were to sail independently. It was agreed that some provision must be made for protection of the slower vessels. Admiral Andrews recommended that every effort be made by routing officers to direct these ships via routes where there was less danger of submarine attack. Ships traveling alone from Cape Lookout south were to sail only in daylight, stopping at night in protected anchorages. At Jacksonville, they were to lay over until sufficient vessels had been assembled to form a slow convoy for passage through the dangerous Florida Straits. Efforts would be made to make every third convoy sailing from the terminal points a slow one.⁶⁰

As each convoy would be under control of commodores and vice commodores from the merchant marine, it was mandatory for Admiral Andrews to secure from the major shipping companies a list of their most experienced and reliable masters. From this list commodores and vice commodores would be selected.

While these arrangements were being made for the longest link in the chain of protection running from Key West to Hampton Roads, similar planning and arrangements were being made for inauguration of coastal convoys from the Delaware to New York and from Boston to Halifax.

On May 8 Admiral Andrews announced that vessels eligible for "the KS and KN convoys" were to be held at assembly points beginning May 10. The date of the first sailing from Hampton Roads would be the 14th, and this convoy would be numbered KS-500. Next day the first northbound convoy, KN-100, would depart Key West.⁶¹

59. Ibid, pp. 5-6.

60. Ibid, pp. 6-7.

61. Ibid, pp. 7-8.

The convoys sailed as planned. KS-500 passed through the Sixth Naval District on May 16. It was escorted by two destroyers, one corvette, two PCs, and two trawlers. KS-500 was provided with air coverage throughout the day by airplanes from the Charleston Naval Air Station. At 6:30 p.m. KS-500 left the District and responsibility for aerial coverage passed to the Seventh Naval District. KN-100 passed through Sixth Naval District waters on May 17, and like the southbound convoy, was provided an aerial escort throughout the day.⁶²

Reports from the escort commanders of these first two convoys revealed difficulties which could be expected in a new venture. It was observed that the merchant captains were unfamiliar with the signals, and it was frequently necessary to call their attention to "principal paragraphs in the merchant signal book by means of visual messages." Merchantmen, upon various occasions, either refused to abide by or failed to respond to signals given them by the commodore. At the Key West anchorage, the locating situation was "appalling." This was attributed to the 18-mile channel through which the vessels had to pass.

In KN-100 the vice commodore did not join the convoy until it was off Miami. When he did, he had with him four vessels, about which the convoy commander had no information. It was accordingly necessary to readjust the entire formation and to assign new positions to the merchantmen. All the way to Norfolk, ships caused delays in the convoy's movements by departing independently for ports of call along the route. But these difficulties, many of them the result of inexperience, some of them the result of lack of time for preparation and indoctrination, and all susceptible of improvement could not hide the fact that both convoys brought all their vessels through safely and on time. Thus after five and one-half months of negotiation, planning, and working, a convoy system for coastal shipping had been established.⁶³

4. The German Offensive Wanes

a. Losses Again Climb

In June officers at Admiral Andrews' headquarters estimated that there were more enemy submarines per day within Eastern Sea Frontier than in any previous month. Rarely, the men in the plotting room reported, were there less than ten, while toward the end of the month there were as many as 18. The daily average for June was 14, they concluded. They were in error, however, because Admiral Doenitz had cut his commitments in the area to reinforce his forces in the Caribbean and Gulf of Mexico.

62. War Diary, Sixth Naval District, May 1942, Operations Archives, Naval History Division, Washington, D.C.

63. War Diary, Eastern Sea Frontier, May 1942, Chapter IV, pp. 8-10, Operations Archives, Naval History Division, Washington, D.C.

As in May most of the U-boats were either enroute to or from their hunting grounds in the Caribbean and Gulf of Mexico. Although more ships were sunk in Eastern Sea Frontier in June than in May, the fact that only 13 were lost by submarine action indicated to Admiral Andrews that "our defense system built up during the past six months is at least sufficiently strong to sustain our losses within bearable limits."

The major reason for this was the convoy system which had been in operation throughout the month. Only four ships sailing in convoy were lost. U-boat captains hesitated to chance attacking the convoys, preferring to take their chances against slower ships sailing independently.⁶⁴

b. German Mine Fields Claim their First Victims

For the first time since World War I, submarines operating in our waters employed mines. Mine fields off Capes Henry and Henlopen accounted for four of the ships sunk and one damaged in the Frontier. Admiral Andrews believed it fortunate that Germany had begun this type of warfare on a limited scale, with results that could be coped with.⁶⁵

c. Admiral Andrews Makes a Bold Proposal

Admiral Andrews on June 1, 1942, suggested to Admiral King the wisdom of organizing killer groups of surface vessels and aircraft to seek out and destroy U-boats. These task forces would have a twofold mission: (a) to seek out the foe in dangerous waters; and (b) To converge on the target and constitute itself as a killer group after a U-boat was pinpointed by either ships or aircraft.

In May, Admiral Andrews had organized experimentally such a group composed of the destroyer *Roper* and patrol bombers of VP-83. The results had given promise of success, but the killer group was soon disbanded because of a shortage of ships and planes.

Explaining what had occurred, Andrews complained that all available forces were currently committed to antisubmarine work and no existing craft could be spared to continue the killer group, let alone form new ones.⁶⁶

This proposal of Admiral Andrews was subsequently adopted, and killer groups consisting of "jeep" aircraft carriers, destroyers, corvettes, and Coast Guard cutters roamed the Atlantic in a relentless war against Doenitz's wolf-packs.

64. War Diary, Eastern Sea Frontier, June 1942, Chapter I, pp. 1-2, Operations Archives, Naval History Division, Washington, D.C.

65. Ibid.

66. Ibid, pp. 3-6.

F. The U-boat Attacks Ebb

1. Doenitz Calls off His Offensive in American Waters

By the end of June 1942 U-boat successes in the Caribbean and Gulf of Mexico had slumped, as they had 60 days before off the east coast of the United States. The convoy system was being gradually introduced into those waters, and Admiral Doenitz knew that the time was at hand when the principal "effort in the U-boat war would have to be switched back to wolf-pack attacks on convoys."

As early as the first week of May, Doenitz had organized a group of eight boats in the Atlantic with the mission of attacking any convoy encountered. A second wolf-pack was organized in early June and sent to intercept a British convoy homeward bound from Gibraltar.

Thus in July, the Germans shifted the "main weight" of their offensive against Allied shipping to attacks on convoys enroute to and from the British Isles in the mid-Atlantic. Here the U-boats were beyond range of land-based air cover.⁶⁷

2. The Results – An Appreciation

A review of the results obtained by the six-month campaign in American waters showed results far exceeding "the high expectations held by U-boat Command in January." At the beginning the foe's "defensive measures had been less effective than had been anticipated, and he took longer than" Admiral Doenitz "had expected to strengthen his defenses and to organize a controlled routing of his shipping."⁶⁸

During this period, German submarines in American waters had sunk more than 360 merchant ships, totaling about 2,250,000 gross tons. A disastrous quantity for the Allies, and correspondingly encouraging for the Axis. On June 15 Admiral Doenitz reported to Reichsführer Adolf Hitler the huge number of ships sunk and compared it to the small number of submarines employed. He forecast "vast possibilities through the rapid increase in number of U-boats and the use of supply submarines." He pointed out the "poor quality of American defenses, the heavy destruction of tankers, and the failure of new construction to keep pace with losses." If American antisubmarine warfare improved, so that coastal attacks became too costly, he proposed to war on transatlantic convoys.

That summer, Doenitz boasted to a German war correspondent, "Our submarines are operating close inshore along the coast of the United States of America, so that

67. Doenitz, *Memoirs*, pp. 221-22, 237.

68. *Ibid*, p. 223.

bathers and sometimes entire coastal cities are witness to that drama of war whose visual climaxes are constituted by the red glorioles of blazing tankers."⁶⁹

In the first six and one-half months of war only eight U-boats were destroyed by United States naval forces. The first kill, *U-656*, had been made on March 1, 1942, off Cape Race, Newfoundland, by a Lockheed-Hudson of Squadron VP-82. The next kill, *U-503*, also made by a Hudson of VP-82 occurred on March 15 off the Newfoundland Grand Banks. On the night of April 13-14 the destroyer *Roper* sunk *U-85* within sight of the Bodie Island Light. This was the first kill registered by Admiral Andrews' Eastern Sea Frontier forces. *Icarus'* victim was *U-352* on her maiden cruise. *U-157* was sunk on June 13 and *U-158* off Bermuda on the last day of June.

Eight kills in six and a half months was not encouraging, as Germany was capable of building as many new U-boats every ten days.⁷⁰

3. Action off Charleston Harbor

Although Admiral Doenitz was redeploying his U-boats to other war theaters, there were several alarms off Charleston Harbor in July 1942.

At 6:20 p.m., on the 22d, the HECF reported that an Army outpost on Folly Beach had reported a submarine conning tower two miles offshore. An Army and several Civil Air Patrol planes and *YP 206* were soon combing the area, with negative results.⁷¹

Four days later, the HECF reported that *YP 204*, on inshore patrol, had sighted a submarine near Buoy 2C. The U-boat, which was surfaced, had immediately submerged. Two PBy's, one Army, and two CAP planes, *YPs 216, 217, and 24* converged on the area to assist *YP 204* in a search for the submarine. No additional contacts were made. Even so, the search was resumed on the 27th, and again the results were negative.⁷²

69. *Ibid.*, pp. 223-24; Morison, *Battle of the Atlantic*, pp. 156-57.

70. Morison, *Battle of the Atlantic*, pp. 154-56; Doenitz, *Memoirs*, pp. 216, 223; War Diary, Eastern Sea Frontier, Apr. 1942, Chapter III, pp. 1-7, Operations Archives, Naval History Division, Washington, D.C.

71. War Diary, Sixth Naval District, July 1942; Operations Archives, Naval History Division, Washington, D.C.

72. *Ibid.*

Three days later, on July 30, *YP 207* reported to the HECF a submarine contact south of Bouy 2C, at the entrance to Charleston Harbor. *YP 204*, Coast Guard cutter *131*, along with one Army observation, a CAP plane, and a PBy sped to the site. The area was searched till dark. At 6 p.m. *YP 207* reported a second contact four miles south of Bouy 2C and attacked with depth charges. She was joined by *YPs 204, 206, 216, and 217*, and *YMs 62*. The area was searched with no results.⁷³

4. Admiral Andrews Commends his Command

On August 15, 1942, Admiral Andrews sent a dispatch to every facility and unit in Eastern Sea Frontier. He pointed out that in the past four weeks not a vessel had been sunk by enemy action in the Frontier. The message ended with the Navy's traditional compliment, "Well done." Three weeks later, on September 10, Andrews announced, "There were no sinkings in August in the Eastern Sea Frontier."

August became the first month since the beginning of hostilities with Germany and Italy on December 11, 1941, that no shipping had been lost in the Frontier to U-boats. Since the sinking of *Bluefields* off Hatteras on July 15, there had been no reported losses. "These six weeks," Admiral Andrews reported, "during which merchant ships of every nation passed through the waters of the Frontier in complete . . . safety are the climax of the months of difficult planning and negotiations that began in the first month of the year."⁷⁴

During the last several months, it had become apparent that the "slowly multiplying" defense forces operating within a carefully matured plan were finally meeting the U-boat menace with increasing success. The success of the past six weeks could be traced in large part, however, to Admiral Doenitz having withdrawn most of his striking power from the Western Hemisphere. But, Admiral Andrews warned, the Frontier was not entirely free of enemy submarines. His staff, on evaluating sightings, had estimated that during August there was an average of three and one-half submarines present daily in waters patrolled by Eastern Sea Frontier ships and planes. Several U-boats had been attacked with undetermined results.

Having withdrawn his submarines from American waters, Admiral Doenitz had redeployed them astride the North Atlantic sea lanes and in the bottleneck east of Trinidad.⁷⁵

73. Ibid.

74. War Diary, Eastern Sea Frontier, Aug. 1942, Chapter I, pp. 1-2, Operations Archives, Naval History Division, Washington, D.C.

75. Ibid, pp. 2-3.

bathers and sometimes entire coastal cities are witness to that drama of war whose visual climaxes are constituted by the red glorioles of blazing tankers."⁶⁹

In the first six and one-half months of war only eight U-boats were destroyed by United States naval forces. The first kill, *U-656*, had been made on March 1, 1942, off Cape Race, Newfoundland, by a Lockheed-Hudson of Squadron VP-82. The next kill, *U-503*, also made by a Hudson of VP-82 occurred on March 15 off the Newfoundland Grand Banks. On the night of April 13-14 the destroyer *Roper* sunk *U-85* within sight of the Bodie Island Light. This was the first kill registered by Admiral Andrews' Eastern Sea Frontier forces. *Icarus'* victim was *U-352* on her maiden cruise. *U-157* was sunk on June 13 and *U-158* off Bermuda on the last day of June.

Eight kills in six and a half months was not encouraging, as Germany was capable of building as many new U-boats every ten days.⁷⁰

3. Action off Charleston Harbor

Although Admiral Doenitz was redeploying his U-boats to other war theaters, there were several alarms off Charleston Harbor in July 1942.

At 6:20 p.m., on the 22d, the HECF reported that an Army outpost on Folly Beach had reported a submarine conning tower two miles offshore. An Army and several Civil Air Patrol planes and *YP 206* were soon combing the area, with negative results.⁷¹

Four days later, the HECF reported that *YP 204*, on inshore patrol, had sighted a submarine near Buoy 2C. The U-boat, which was surfaced, had immediately submerged. Two PBys, one Army, and two CAP planes, *YPs 216, 217, and 24* converged on the area to assist *YP 204* in a search for the submarine. No additional contacts were made. Even so, the search was resumed on the 27th, and again the results were negative.⁷²

69. *Ibid.*, pp. 223-24; Morison, *Battle of the Atlantic*, pp. 156-57.

70. Morison, *Battle of the Atlantic*, pp. 154-56; Doenitz, *Memoirs*, pp. 216, 223; War Diary, Eastern Sea Frontier, Apr. 1942, Chapter III, pp. 1-7, Operations Archives, Naval History Division, Washington, D.C.

71. War Diary, Sixth Naval District, July 1942; Operations Archives, Naval History Division, Washington, D.C.

72. *Ibid.*

Three days later, on July 30, *YP 207* reported to the HECF a submarine contact south of Bouy 2C, at the entrance to Charleston Harbor. *YP 204*, Coast Guard cutter *131*, along with one Army observation, a CAP plane, and a PBy sped to the site. The area was searched till dark. At 6 p.m. *YP 207* reported a second contact four miles south of Bouy 2C and attacked with depth charges. She was joined by *YPs 204, 206, 216, and 217*, and *YMs 62*. The area was searched with no results.⁷³

4. Admiral Andrews Commends his Command

On August 15, 1942, Admiral Andrews sent a dispatch to every facility and unit in Eastern Sea Frontier. He pointed out that in the past four weeks not a vessel had been sunk by enemy action in the Frontier. The message ended with the Navy's traditional compliment, "Well done." Three weeks later, on September 10, Andrews announced, "There were no sinkings in August in the Eastern Sea Frontier."

August became the first month since the beginning of hostilities with Germany and Italy on December 11, 1941, that no shipping had been lost in the Frontier to U-boats. Since the sinking of *Bluefields* off Hatteras on July 15, there had been no reported losses. "These six weeks," Admiral Andrews reported, "during which merchant ships of every nation passed through the waters of the Frontier in complete . . . safety are the climax of the months of difficult planning and negotiations that began in the first month of the year."⁷⁴

During the last several months, it had become apparent that the "slowly multiplying" defense forces operating within a carefully matured plan were finally meeting the U-boat menace with increasing success. The success of the past six weeks could be traced in large part, however, to Admiral Doenitz having withdrawn most of his striking power from the Western Hemisphere. But, Admiral Andrews warned, the Frontier was not entirely free of enemy submarines. His staff, on evaluating sightings, had estimated that during August there was an average of three and one-half submarines present daily in waters patrolled by Eastern Sea Frontier ships and planes. Several U-boats had been attacked with undetermined results.

Having withdrawn his submarines from American waters, Admiral Doenitz had redeployed them astride the North Atlantic sea lanes and in the bottleneck east of Trinidad.⁷⁵

73. Ibid.

74. War Diary, Eastern Sea Frontier, Aug. 1942, Chapter I, pp. 1-2, Operations Archives, Naval History Division, Washington, D.C.

75. Ibid, pp. 2-3.

VII. THE HECP AND WORLD WAR II

A. The Mine Scare

Throughout most of World War II, Army and Navy personnel manning the Fort Moultrie HECP-HDCP faithfully stood their watches and waited. The War Diary for the Sixth Naval District occasionally made mention of activities at the post.

On August 14, 1942, at 12:53 a.m., the HECP advised that "Direx" had picked up a target 20 miles offshore, at 32° 30' North and 79° 22' West. By 3 a.m. the object was at 32° 29' 30" North and 79° 25' West, and at 3:11 at 32° 39' 30" North and 79° 28' West.

The plot then disappeared to reappear at 3:45 a.m. at 32° 43' North and 79° 32' West, and at 4:05 a.m. at 32° 43' North and 79° 35' West. It remained at the last position until 5:50 a.m., when it vanished. Personnel at the HECP plotted this last position as bearing 105° 15 miles from the Direx Station on the north end of Sullivan's Island.

CG 186 was ordered to search the area, and the guard ship at the entrance to Charleston Harbor was alerted to be on the lookout for enemy submarines. A PBY, taking off on routine patrol at 6:15 a.m., was asked to report on any surface craft seen in the area of the plot. No sightings were made.

When the District Intelligence officer reviewed the tracts of surface craft off Charleston, when the Direx contact was made, he found that the tract of Y-603, on coast picket, coincided.¹

In September 1942 enemy submarine activity in Eastern Sea Frontier was minimal. No ships were attacked, but the foe's presence in the area was felt through mining operations. On the night of the 12th, three mines were exploded off Cape Henry, Virginia, and four more subsequently detonated by minesweepers. Because of the mines, the Port of Norfolk was closed to traffic on September 13-14.²

Ten days later, on September 24, AMC 79 at 1:15 p.m. detonated a mine about two and one-half miles due east of Bouy 2C, near the entrance to Charleston Harbor. This news was promptly relayed by the HECP to the commander of the Port of Charleston, and within 15 minutes he had closed the port, diverting all inbound shipping to Savannah.

1. War Diary, Sixth Naval District, Aug. 1942, Operations Archives, Naval History Division, Washington, D.C.
2. War Diary, Eastern Sea Frontier, Sept. 1942, Chapter I, pp. 1-3, Operations Archives, Naval History Division, Washington, D.C.

Seven hours later, *YMs 27* exploded a mine two miles from the bouy. Next day two more mines were detonated by minesweepers. The sweeping operations were continued until the last day of the month, except when interrupted by foul weather on the 28th. When no more mines were found, the Port of Charleston was reopened on October 1.³

By October the situation had improved to the point where it was possible for Eastern Sea Frontier to release for service elsewhere 18 of the British trawlers which had been doing yeoman's work in American waters since March. When they departed, the trawlers shaped a course for the western and southern coasts of Africa, their new duty stations.⁴

B. Operations in 1943

On March 6, 1943, *YC 299* (a derrick), went aground on the jetty rocks near the net gate at 11:52 a.m. during a gale. Personnel of the HECF notified the Naval Base of her difficulty, and the tug *Catawba* was sent to free her. She was unsuccessful that day, but on the 7th, at flood tide, she refloated *YC 299*.⁵

On March 11, at 2:11 a.m. *YP 24* reported a submarine contact 1,500 yards south of Bouy 2C. She dropped one depth charge, and *SC 658* and *SC 1017* were ordered to the area as reinforcements. As the water at this point was only 43 feet deep, and the nearest wreck was six miles away, this contact was described by combat intelligence as doubtful.⁶

BYMS 167 on September 20, 1943, detonated a possible "Red" mine at 32° 24' North Latitude and 79° 32' West Longitude. Alerted by the HECF to what had occurred, the Port of Charleston closed while six minesweepers rushed to the danger point. The area was swept. No more mines being exploded, the port was reopened to merchant shipping on the 21st.⁷

3. Ibid; War Diary, Sixth Naval District, Sept.-Oct. 1942, Operations Archives, Naval History Division, Washington, D.C. On September 18, *U-455* had laid 12 mines off the entrance to Charleston Harbor. This was the second incident of this character. *U-751* at the end of July had planted a similar number of mines off the harbor entrance with negative results.
4. War Diary, Eastern Sea Frontier, Oct. 1942, Chapter I, pp. 1-4, Operations Archives, Naval History Division, Washington, D.C.
5. War Diary, Sixth Naval District, Mar. 1943, Operations Archives, Naval History Division, Washington, D.C.
6. Ibid.
7. War Diary, Sixth Naval District, Sept. 1943, Operations Archives, Naval History Division, Washington, D.C.

C. Operations in 1944

The Captain of the Port of Charleston at 9:19 p.m., on January 21, 1944, learned from the HECP that the Mounted Beach Patrol Supply Boat *C 3455* was stranded on the reef at Capers Inlet. *CG 34024* was ordered to the scene to lend assistance, while the Sullivan's Island LB Station dispatched a "duck." At 9:25 Sullivan's Island reported the "duck" had removed the crew of *C 3455*, and that *CG 34024* was standing by to attempt to refloat the craft at high tide. This was done at 9 a.m. on the 22d.⁸

On March 9, 1944, the same week in which the HECP-HDCP was located in its new quarters, a crew from the Charleston Navy Yard was sent to the Harbor Net Gate and installed a new centenary lift cable. The next day new transformers were positioned on the operating platforms, and tested through electrical cable from the HECP for the purpose of conveying energy to the platforms.⁹

The floor of the south platform for the Charleston Harbor Net Gate was rebuilt in the second week of June 1944, a new winch and power plant installed, and the net readied for operation. At the request of the commanding officer, Port of Charleston, two flashing green lights were positioned on the platform.¹⁰

On June 25, 1944, the HECP notified the commander, Port of Charleston, that the observation post at St. Catherines Island, Georgia, had been destroyed by a gale. The crew had escaped injury and the equipment had been salvaged.¹¹

At 3:08 p.m., on the same day, the HECP reported a sailboat capsized off Morris Island, just inside the net, about 900 yards offshore. A second sailboat and a rowboat were also sighted beyond Buoy 25. *CG 38806* put out from the fleet landing to assist the craft in distress and to order the two others back to the shore. By 3:40 a speedboat

8. War Diary, Sixth Naval District, Jan. 1944, Operations Archives, Naval History Division, Washington, D.C.

9. War Diary, Sixth Naval District, Mar. 1944, Operations Archives, Naval History Division, Washington, D.C.

10. War Diary, Sixth Naval District, June 1944, Operations Archives, Naval History Division, Washington, D.C.

11. Ibid. On June 3 Lt. Comdr. M. B. Lanker reported at Fort Moultrie for duty at the HECP.

from Sullivan's Island was on the scene and rescued three of the four-man crew from the sailboat *Nana*. CG 38806 rescued the other.¹²

On September 13, 1944, at 9:45 a.m., the HECP reported a ship in convoy C-5 with an injured man the captain wished to send ashore. Coast Guard and Immigration were notified, and a boat sent to the ship. At 11:40 the man was landed at the Fort Sumter Hotel dock and rushed to a hospital.¹³

Next day a ship in convoy B-7 notified the HECP that a small craft was stranded on her port side and needed assistance. The HECP relayed this information to the commander, Port of Charleston, and a boarding boat was dispatched from the fleet landing, and towed the boat into Adger's Wharf.¹⁴

D. The Charleston Hurricane of October 1944

On October 19, 1944, at 11:30 a.m. all shipping in Charleston Harbor was alerted that a hurricane was approaching the coast and took shelter in the upper reaches of the Cooper River. The Charleston Naval Base and dock were secured. All loose gear was battered down.

Throughout the afternoon, weather conditions progressively deteriorated, with heavy rain and wind out of the northeast. At 8:45 p.m. there was a lull, and the barometer, which had been falling all day, rose in the next 30 minutes from 29.40 to 29.48. The wind began to build up rapidly and roared in in gusts from all directions. The barometer fell to 29.43, as the eye of the hurricane passed over the city. By 9:45 the worst was over. The tide rose to 10.1 feet above mean low water at 10 p.m.

Heavy winds and seas continued to buffet the area until mid-morning on the 20th. Power services in the city had failed at 6 p.m., and at the Navy Base emergency power was put into operation. Early in the evening of the 19th, telephone service failed. Communications with the rest of the nation for the next few hours were maintained by the radio transmitters at the HECP and base headquarters.¹⁵

12. Ibid.

13. War Diary, Sixth Naval District, Sept. 1944, Operations Archives, Naval History Division, Washington, D.C.

14. Ibid.

15. War Diary, Sixth Naval District, Oct. 1944, Operations Archives, Naval History Division, Washington, D.C.

APPENDIX A

"Instructions for the Examination and Entry into United States Ports in Time of War"

Defensive Sea Areas will be established as needed in the approaches and harbors of selected important ports. Their establishment, pursuant to "Joint Action of the Army and Navy, 1935," establishes legal naval control of the areas specified in Executive Orders of the President.

Actual naval control of certain harbors may be undertaken, as it has in the past, previous to the legal steps involved, when necessary for security. This control may be initiated locally or on order of the Chief of Naval Operations. Those ports in which naval control has been established will be known hereinafter as "controlled ports."

In time of war or emergency, it is necessary as a measure of defense at all controlled ports for every incoming vessel of any description whatever to be identified as not hostile before being permitted to pass within the defenses of the port.

There are two methods by which identification and entry of ships are effected:

- (A) The Major Warship Procedure.
- (B) The Merchant Shipping Procedure.

Designation of "Major War Vessels" and "Minor War Vessels" is given in Appendix "C."

DEFINITIONS

- | | | |
|-------------------|---|--|
| AXO | - | Assistant Examining Officer. |
| CXO | - | Chief Examining Officer (Captain of the Port). |
| H.E.C.P. | - | Harbor Entrance Control Post (Joint Army and Navy watch keeping station). |
| Major War Vessels | - | Such combatant vessels as are supplied with the "Secret Recognition Signal Memoranda." |
| Minor War Vessels | - | All war vessels as are not supplied with the "Secret Recognition Signal Memoranda" but instead use the "Display Signal." |

- Point of Arrival** - A point on the approach route 12 miles from the H.E.C.P. signal station which will be sighted from the direction of approach.
- Time of Arrival** - Time of arrival at the "Point of Arrival."
Use standard time of port of destination.
- Time of Departure** - The time at which a ship expects to pass through the inner booms or other defenses.
- Display Signal** - Furnished minor war vessels for identification purposes.
- Special Signal** - Furnished merchant vessels who have passed satisfactory examination which will permit her passage through port defenses.
- Secret Recognition Signal Memoranda** - Used by major warships for identification purposes.
- Controlled Port** - A harbor or anchorage in which entrance and departure, assignment of berths, and traffic within the harbor or anchorage are controlled by naval and/or military authorities.

LIST OF ANNEXES

- A. List of Harbor Entrance Control Posts.
- B. List of Coastal Signal Stations. (not included, at this time)
- C. Designation of "Major War Vessels" and "Minor War Vessels."
- D. Communications.

Harbor Entrance Control Post (H.E.C.P.)

1. There has been, or will be established at all of the fortified harbors of the continental United States, its possessions, at certain specified leased bases, and at specified ports in territory occupied in time of war, a Harbor Entrance Control Post. Such ports are hereafter designated as a "controlled port." *This H.E.C.P. is a joint Army and Navy watch keeping station whose mission is "to collect and disseminate information of activities in defensive sea areas; to control unescorted merchant shipping in the defensive coastal area; and to take prompt and decisive action to operate the elements of the harbor defenses; in order to deny enemy action within the defensive coastal area."* There will be an Army and Navy officer continuously on watch at each H.E.C.P. An integral part of the H.E.C.P. is a signal station which may or may not, according to local characteristics, be physically combined with the H.E.C.P. When it is separated, it will be in communication by land line telephone and voice radio with the H.E.C.P. For a list of H.E.C.P.'s, see Annex "A." For a list of Coastal Signal Stations, see Annex "B."

2. *So far as the Navy is concerned, the naval watch keeping officer at the H.E.C.P. will be a representative of the naval officer directly responsible for the operation of the local naval defenses of the harbor.*

Traffic Control Procedure

3. There are two forms of procedure by which this control is exercised at fortified ports.

(A) The Major Warship Procedure (British "Private Signal")

(B) The Merchant Shipping Procedure (British Examination Service)

4. All U. S. war vessels, and war vessels of allied and associated powers, holding the secret recognition signal memoranda, will follow the Major Warship Procedure.

5. All minor U. S. war vessels and allied war vessels not possessing the secret recognition signal memoranda, and merchant shipping, will follow the Merchant Shipping Procedure.

6. Ships entering under the Major Warship Procedure will be admitted by the H.E.C.P. through its signal station which will identify these vessels by exchange of the proper recognition signals.

7. Ships using the Merchant Shipping Procedure will be admitted by the Examination Vessel after proper identification determined as laid down in later paragraphs.

MAJOR WARSHIP PROCEDURE

8. To enable the defenses to ascertain whether an approaching ship is a U. S. or allied war vessel, and to avoid delay in the entrance of war ships, particularly where submarine attack has to be guarded against, the following procedure will be followed at all U. S. controlled ports and such other ports as may be designated.

Notification of Arrival

9. Major warships anticipating arrival at a controlled port or anchorage will, unless urgent reasons of security prevent, send a "preparatory" message to the responsible officer at the port of arrival, giving the names of the ships due to arrive and the estimated time of arrival at the "Point of Arrival."

10. When sailing direct from one port to another, this "preparatory" message should be sent from the port of departure in code by land line or cable.

11. If a ship (or ships) are proceeding to a port on completion of sea operations, the senior officer of the ships will send the "preparatory" message in code by radio not less than four hours before the time of arrival, unless the risk of breaking radio silence cannot be accepted.

12. An "amending" message will be sent by the senior officer of a ship (or ships) proceeding to a controlled port, if the ships wish to pass the net or boom defenses, and the time of arrival given in the "preparatory" message is more than fifteen minutes in error.

13. An "amending" message will also be sent by the senior officer of ships not wishing to pass the boom defenses, or by a Convoy Commander, when the time given in the "preparatory" message is more than one hour in error.

14. When possible, the "amending" message will be made in plain language by visual through any coastal signal station on the message by landline. If this is not possible, it will be made as early as possible in code by radio, if the risk of breaking radio silence can be accepted. The "amending" message will take the form of a correction to the original message and will not specify the actual place or time of arrival.

15. The value of sending of radio messages described in paragraphs 11, 12, 13 and 14 must be balanced against –

- (a) The ship being located and identified by radio d/f and information gained from the encoded message even though its contents are not known exactly.

- (b) The ship being located and attacked by submarines or aircraft taking in the radio transmission.

16. The responsible officer at the port of arrival will acknowledge all "preparatory" and "amending" messages by land telegraph or cable to the originator and/or the ships concerned, if possible, otherwise by radio. If ships do not receive acknowledgment of the messages within four hours of their scheduled time of arrival, the ship of the senior officer will repeat the message or messages not acknowledged. The responsible officer will keep the H.E.C.P. at the port of arrival informed of all "preparatory" and "amending" messages received. The H.E.C.P. will notify the *Army Commander of Harbor Defenses*, the Captain of the Port, the Examination Vessel, the patrol vessels outside the entrance; will arrange that the gate in the net and boom defenses is open at the required time and that signals are made to the arriving ships before their actual arrival in the harbor, regarding their berths or any other information which will aid their passage up harbor. When preliminary notification of arrival has not been given, the ship will be challenged by H.E.C.P. and Recognition Signal will be returned. If two or more ships are in company, only the Senior makes the Recognition Signal. After H.E.C.P. has acknowledged the Recognition Signal, the ship or Senior asks permission to enter harbor. Ships awaiting permission to enter are not to approach nearer to the port until it is certain that their identity has been established. They are to take the usual precautions against submarine attack.

Procedure for Identification of Major Warships

17. The identification of major warships holding the secret recognition signal memoranda will be done by the H.E.C.P. signal station. In this connection it is pointed out that at some ports there will be coastal signal stations in the harbor approaches that are to seaward of the H.E.C.P. signal station which may "challenge" approaching war vessels before they have been "challenged" by the H.E.C.P. signal station. These "challenges" should be properly answered if received, but do not eliminate the necessity for a ship properly identifying itself with the H.E.C.P. signal station.

18. The procedure for identification by the H.E.C.P. signal station is as follows:

19. When a major warship comes within visual signal distance of the H.E.C.P. signal station, the station will make the "challenge."

20. The ship of the senior officer will make the "reply" by visual in accordance with the secret recognition signal memoranda. The recognition signal will be made by searchlight and never by radio. At night the blinker tube will be used or the smallest effective searchlight in making the "challenge" and "reply."

21. The "reply" will be acknowledged by the H.E.C.P. signal station. *The naval watch keeping officer at the H.E.C.P. will notify the Army Commander of Harbor Defenses through the Army watch keeping officer, the Captain of the Port, the local Senior Naval Officer, the Examination Vessel, and the gate vessels, of the warships approach. Unless otherwise directed by proper authority, the naval watch keeping officer will, after receiving a report that the controlled mine fields are set at "safe" and that the batteries have been instructed not to fire, direct the signal station to grant permission for the ship to enter.*

22. Should the H.E.C.P. signal station not "challenge" as soon as warships come within visual signal distance, the ship of the senior officer will make the "reply" to the station until the "challenge" is made, when the "reply" will be repeated. It is the duty of the local Senior Naval Officer to insure that the H.E.C.P. is daily given the "reply" that major U.S. and allied warships should make to a "challenge."

23. Ships should not be kept waiting longer than is absolutely necessary, for permission to enter the harbor, as delay may lay them open to risk of submarine attack.

24. If a warship makes the improper "reply," the H.E.C.P. signal station immediately hoists the signal "stop instantly" and informs *the naval watch keeping officer at the H.E.C.P. who through the Army watch keeping officer informs the Army Commander of the Harbor Defenses, the gate vessels, the local Senior Naval Officer, and the Examination Vessel. If the ship fails to obey this signal she will be assumed to be hostile. The responsibility for opening fire with the shore batteries rests with the Army.*

Submarines and Motor Torpedo Boats

25. It is conceivable that situations may arise when the entrance of submarines and motor torpedo boats (or other high speed small surface craft) will be denied at night or during fog.

Navigation Lights

26. In the event that a harbor is "blacked out" at the time of entry of warships, navigation lights, except the stern light, will be shown only by the leading ship of a squadron or group and by all ships entering singly. The point at which navigation lights are to be switched on will be decided by the Commanding Officer of the ship concerned.

Net or Boom Gate Signals

27. To enable ships to know whether the net or boom gate is open or shut, and, if open, whether for outgoing or incoming traffic, the gate vessels will show the following signals:

(a) If for Outgoing Traffic: The port hand vessel for ships going to sea – one black ball by day, one red light by night, and W by sound signal in thick weather. The starboard hand vessel – one black cone by day, one green light at night, and K by sound signal in thick weather.

(b) If for Incoming Traffic: The port hand vessel for ships entering the harbor – two black balls by day, two red lights at night, W by sound signal followed by a long blast in thick weather. The starboard hand vessel – two black cones by day, two green lights at night, and K by sound followed by a long blast in thick weather.

Merchant Shipping Procedure

28. The examination of merchant vessels entering a controlled port is an integral part of the defensive organization of the port. But it should be understood here that this procedure in no way concerns the recognition and entry of those U. S. warships or other vessels which are provided with the secret recognition signal memoranda.

29. The principal purpose for examination of the merchant vessel is to determine its identity and to ascertain its character and intentions, in order that the defenses may have warning of the attempted entry of suspicious or unfriendly ships. The examination personnel may also serve certain subsidiary purposes, that is, to issue warnings against unauthorized use of radio, warning masters to comply with any local regulations and furnish the master with any special instructions that may be immediately applicable to his current visit in the port.

30. It is essential for both military and economic reasons that delay in the movement of entry, involved by examination, be reduced to the minimum.

31. The control of traffic entering the port by the institution of an examination before entrance shall normally be inaugurated only on orders from the Chief of Naval Operations. However, should an emergency situation arise which, in the opinion of the Commandant of the district, requires the inauguration of such control before approval can be obtained from the Chief of Naval Operations, he may establish the examination vessel and advise the Chief of Naval Operations.

32. Essential requirements for conducting an examination are:
- (a) An examination anchorage.
 - (b) One or more examination vessels which may or may not be armed.
 - (c) Examination officials and enlisted personnel.
 - (d) An examination battery and, if necessary, a supporting battery.
 - (e) Armed guards for suspicious vessels.

33. At all fortified ports and at such naval bases and occupied ports abroad, as may be designated, which are garrisoned by the Army, the Navy is responsible only for (a), (b) and (c) of the foregoing requirements and for applying traffic regulations. The Army is responsible for (d) and the designation of the examination battery by the Army for any port should form a part of the Local Joint War Plans. (e) Will be provided by either the Army or Navy in accordance with arrangements made between local Army and Navy authorities.

Procedure for Identification of Merchant Shipping

34. Incoming vessels must, under the Merchant Shipping Procedure, normally be admitted to the Examination anchorage when this is situated outside the net or boom defenses, at all times of the day or night. Circumstances may demand that a departure be made from this normal procedure, vessels being admitted to the examination anchorage only in daylight and in clear weather.

35. A vessel which is anchored in the examination anchorage must not leave it without permission from the Examination Officer.

36. The detailed procedure to be followed with incoming vessels must vary at different ports according to local conditions, that is, geographical, defensive, etc.

37. Governing conditions are:

(a) Vessels should not be exposed to submarine attacks by being "brought-to" for examination in open waters, if this can be avoided.

(b) Boarding, when carried out, must take place far enough to seaward to enable the vessel to be dealt with by the examination battery should she prove unsatisfactory.

(c) Arrangements must be made for putting pilots on board where this is necessary.

Incoming Merchant Vessels

38. On a merchant vessel approaching the port; the examination steamer will close her and signal either "stop instantly" or "follow me." If she is identified, the Examining Officer after satisfying himself as to her character will, if the port is opened, give her the special signal and allow her to proceed inward with as little delay as possible. If the port is closed, he will direct her to remain in the examination anchorage or proceed to sea. The H.E.C.P. signal station on seeing a vessel flying the special signal will inform the naval watch keeping officer at the H.E.C.P. and he will direct that the net or boom gates be opened for passage of the vessel.

39. If an approaching vessel disregards the signals made to her by the examination vessel, the latter will inform the H.E.C.P. *which will request the Army Commander, Harbor Defenses, through the Army watch keeping officer to have the examination battery "bring-to" the vessel with the shot across her bow.*

40. If the approaching vessel is not identified, she will be directed to proceed to the examination anchorage where her papers will be examined, and the master will be questioned as to his proceedings, intentions, etc., and the necessary examination of the vessel will take place. Should the papers prove to be correct and inquiries on the part of the Examining Officer remove all doubt from his mind as to the innocent character of the vessel, the vessel will then be given the special signal and allowed to proceed, the pilot being put on board when necessary.

41. Among the grounds for regarding a merchant vessel as suspicious are:
- (a) Unexpected arrival, especially in home waters, where all arrivals should be notified in advance.
 - (b) General build of the vessel incompatible with the declared nationality.
 - (c) Any unusual features in the hull or superstructure.
 - (d) Boats unusual in class, size and number.
 - (e) Considerable basic cargo not available for ready examination.
 - (f) Unusual number of crew for size and class of vessel.
 - (g) Appearance of crew incompatible with their supposed nationality.
 - (h) Draft of the vessel incompatible with nature and quantity of cargo as declared, and with supposed length of voyage.
 - (i) Outward appearance of regular trader but masters and officers not known to examining vessel.
 - (j) Regular trader arriving after an unusual long absence and unable to show good cause for this absence.
 - (k) Current regulations regarding search have not been observed (U.S. or Allied ports).

42. The examining officers should be warned of the possibility of vessel being fitted with mine laying arrangements, or submerged torpedo tubes, or otherwise prepared for hostile action such as blocking, and they should be directed to exercise the greatest vigilance in dealing with suspicious vessels, the chief consideration being that they should not be allowed to proceed to any position where they can do material damage, or land troops or tanks.

43. If a suspicious vessel is brought to an inner examination anchorage inside of the net or boom defenses, or otherwise inside of a harbor area, she should be directed to anchor where she can do the least damage in the event she proves hostile. In the event of a vessel being suspicious and necessitating a detailed search and possibly partial unloading of her cargo, the decision will rest with the Examining Officer as to whether she will remain in the outer examination anchorage or be taken to a more protected anchorage inside of the net or boom defenses. In any event, the Examining Officer will inform the H.E.C.P. of the situation. *The naval watch keeping officer, through the Army watch keeping officer, will inform the Army Commander of Harbor Defenses, and the Examination battery and Captain of the Port.* Arrangements will be made by the Captain of the Port for providing and placing the necessary armed guard on board a suspicious vessel to insure no hostile action being committed while at anchor in the examination anchorage or during her passage from an outer examination anchorage to a berth or inner examination anchorage in the harbor.

44. One of the guns of the examination battery should be kept trained on an incoming vessel regarded suspicious until an armed guard has taken charge of her. During her detention, a suspicious vessel will be given a special day and night signal to be exhibited for identification by the covering battery.

45. A merchant vessel is to be regarded as hostile when:

- (a) She refuses to be "brought-to" by the Examination Battery.
- (b) She is observed committing an undoubtedly hostile act.
- (c) Violence is shown to the Examining Officer.
- (d) Flagrant disobedience of the orders given by the Examining Officer.

46. If a vessel attempts to proceed inward beyond the Examination Anchorage or other specified limit without showing the special signal, *the naval watch keeping officer at the H.E.C.P. will request that she be "brought-to" by the examination battery, this request being transmitted through the Army watch keeping officer.*

47. Should the Examination Vessel be unable, due to bad weather, to maintain her station, the port should normally be closed. Under these circumstances, merchant vessels would anchor in Examination Anchorage or remain at sea. It is obviously undesirable, however, to delay transports, hospital ships, and merchant ships of

undoubtedly friendly character, particularly if their arrival has been notified in advance, and the authority responsible for closing the port may therefore, at his discretion, order such ships by signal to enter, having due regard to the circumstances.

Lights to be displayed by Merchant Vessels in Convoy when approaching Examination Anchorages at Night.

48. Merchant vessels in convoy may be directed to show two red lights, horizontally, until the Examining Officer orders them turned off. Necessary orders to the convoy must be given by the escorting vessels.

Vessels in Tow

49. Should a vessel approach the port with another vessel in tow, the character of each vessel must be ascertained.

Examining Officer's Log

50. Particulars of every vessel dealt with and the action taken are to be entered in the Examining Officer's log by the officer who carries out the examination. In the case of vessels not boarded, the senior Examining Officer on board is responsible for recording the vessel.

The Object and Constitution of the Organization for Examination of Shipping

51. The examination of vessels entering a fortified harbor or certain other specified harbors is one of the functions of the Captain of the Port (normally an officer of the Coast Guard), related to and an integral part of his larger responsibility for harbor security. It has to do with the determination of the characteristics of a vessel, her cargo, with a view to preventing entrance into the harbor of any vessel which might be fitted with concealed weapons of any nature which could be used for attack against the shipping of the harbor or any of the harbor facilities.

52. The examination of vessels at any harbor will be inaugurated upon orders of the Chief of Naval Operations. When it is established, the District Commandant will inform the Chief of Naval Operations who in turn will advise the forces afloat.

Examination Anchorages

53. At each fortified port, or other specified controlled port, an anchorage called the "Examination Anchorage" must be assigned for the purpose of detaining vessels for examination. The position of this anchorage should be covered by the following conditions wherever possible:

(a) It should be sheltered from prevailing winds. Wherever practicable, it should be the same anchorage for all weathers. If the latter is not practicable, an alternative anchorage must be assigned. It may be necessary in some localities to have an "outer" and an "inner" examination anchorage. The "outer" anchorage should be to seaward of the nets, booms, seawall or other obstruction and in such a position that there would be ample time for the defenses to deal with a vessel leaving the "outer" anchorage with hostile intent before she could reach an objective such as the net or boom gate, or waters where the fact of her being sunk would cause serious embarrassment to the free navigation of the port or approaches. The "inner" anchorage should be inside the net, boom, sea-wall or other obstruction. The "outer" and "inner" anchorages should be used as necessary having due regard for the necessity of minimizing danger to the port from disguised merchant vessels with hostile intent and, to the safety of friendly shipping. At some ports where these previously mentioned obstructions exist it may be found that two anchorages are not practicable. In such cases, it will be necessary to arrive at a compromise to meet the requirements of both the safety of friendly shipping and the safety of the port. If local conditions permit, a position outside the boom or obstruction is desirable.

(b) The whole anchorage should be covered by the fire of examination batteries and should be capable of illumination by defense searchlights. In localities where this cannot be completely realized, it must be located so that its exits will be covered by the fire of examination batteries and at least a sufficient portion of it illuminated by defense searchlights, where ships remaining in the anchorage during hours of darkness may be berthed and adequately illuminated.

(c) It must be clear of submarine cables and underwater defenses.

(d) As a general rule, it is undesirable that the limits of examination anchorages should be published as this will give useful information to the enemy, both of likely targets and of areas clear of mines. The Public Traffic Regulations for a harbor can eliminate the necessity for this by directing the line of approach to a harbor which will lead incoming vessels to the examination anchorage.

Examination Vessels

54. Vessels assigned to service as Examination Vessels may be any type suitable to keep the sea in the examination area. These vessels may or may not be armed according to the situation existing in the locality where they are stationed. It should be equipped with motor or pulling boats suitable for boarding work in moderate to bad weather, with means of hoisting in and out promptly in a seaway. Her mast should be high enough to carry the flags or lanterns denoting her character and fitted for exhibiting display signals. She should also have a means of making sound signals by whistle or siren and visual signals both by day and by night. Examination Vessels will be fitted with voice radio or other radio equipment. Her accommodations should be adequate for the examination personnel and, if necessary, pilots in addition to the crew.

55. The Examination Vessel will carry out her duties in or near the Examination Anchorage, taking care not to lose communication with *Examination Battery*. At ports where, owing to the Examination Anchorage being some distance from the entrance, one Examination Vessel cannot efficiently carry out her duties from a position in or near the anchorage, it may be necessary to have patrol vessels assist, particularly if a controlled mine field is involved.

56. Unless prevented by weather conditions, the Examination Vessel should be at her post at all times of the day and night, whether the port is open or closed in order to see that the regulations are strictly carried out and to give notice of any irregularities. If she is not on station she should be ready to proceed to her station in all weathers in order that all vessels requiring examination before entrance should not be delayed unless delay is unavoidable. If the Examination Officer cannot board an approaching vessel, due to weather conditions, it would be at the discretion of the local Senior Naval Officer to order the latter in by signal if he is satisfied as to her friendly identity, otherwise she must anchor or remain at sea until the weather moderates.

57. Examination Vessels are distinguished by the following means: By Day – the Union Jack flying at the truck. When the port is closed they will hoist three red balls vertically, in addition, at the yard arm.

58. By Night – three lights vertically six feet apart conspicuously displayed at the yard arm so as to show an unbroken light around the horizon. When the port is open these lights will be white; when it is closed they will be red, but only two in number. The above lights are to be carried in addition to the ordinary navigation lights, and must be displayed in such a manner as not to be confused with the masthead lights. The display of lights at night will, however, be governed by whatever measure of lighting restriction is in force.

Examination Batteries

59. The Examination Battery is for the purpose of supporting the Examination Vessel and will be designated by the Army *Commander of Harbor Defenses*. It should be in constant readiness to "bring-to" vessels which fail to comply with orders of the Examination Vessel and largely to enforce obedience to the restrictions imposed in the procedure for conducting the examination of entering vessels."

60. The guns of the Examination Battery should always be manned and ready for immediate action. A gun should be kept trained on an incoming vessel until she has hoisted the correct "special signal" which signal will indicate that she has been passed as friendly by the Examining Officer or that she has been placed in charge of an armed guard. A few rounds of *plugged* shell should be kept available near the gun to "bring-to" vessels, but separate from the service ammunition, so that there may be no danger of confusing them.

61. *The Examination Battery should keep a station watch on the Examination Vessel and on merchant vessels entering the port.* All officers and enlisted men manning the Examination Battery should know the position and limit of the Examination Anchorage, mine-fields, net or booms, dangerous areas, prohibited anchorages, etc.

62. *The responsibility for opening fire with the Examination Battery or any other shore battery manned by the Army rests with the Army but the H.E.C.P. or the Examination Vessel may request the proper Army authorities to open fire with the Examination Battery, or other batteries, if such is deemed necessary to enforce the regulations for the control of traffic entering the port.* A request to "bring-to" a vessel should unhesitatingly be made under the following circumstances.

(a) If the incoming vessel disregards the orders signalled to her by the examination steamer.

(b) *Should a vessel disregard a warning shot across the bow, the Examination Battery should open fire with shell on her and this should be a signal for other batteries to open fire also.* It should be borne in mind that in some ports it is difficult to stop an incoming ship on a flood tide. If this tidal situation exists and if doubt exists, *the battery should not open fire until the Examination Vessel makes the alarm signal prescribed in paragraph 68.*

63. *It is presumed that the Army will take the necessary steps to engage without first "bringing-to" any vessel recognized to be of a hostile nature.*

64. The Examination Vessel will maneuver to keep clear of the line of fire of the Examination Battery.

Communication Between Examination Vessels, Examination Batteries, and Harbor Entrance Control Posts

65. It will not, as a rule, be necessary for other than prearranged signals to pass between the Examination Vessels and the *Examination Battery* regarding the character of incoming vessels. However, means of communication by semaphore, flashing light, radio telephone, and sound (fog horn, whistle, or siren) are available.

66. In order to make certain that messages between the Examination Vessel and the *Examination Battery* are clearly understood, the following procedure is to be followed:

By Day – International "Z" is to be hoisted by Examination Vessel and by Examination Batteries when either one is calling the other.

By Night – The Examination Vessel and Examination Battery will mutually call each other by a succession of "Z"s which is to be answered by a succession of "Z"s.

67. If an Examination Vessel wishes the examination battery to "bring-to" an incoming vessel, she will:

By Day – Hoist 2 pennant (International Code) and make a succession of 2's by flashing and sound signal.

By Night – Burn a blue light and make a succession of 2's by flashing and sound signal. This signal will indicate only that the incoming vessel being dealt with is disregarding orders and that the Examination Vessel requests that she be "brought to."

68. Should any hostile action on the part of a merchant vessel or her crew be observed by the Examining Officers, and should time and opportunity not permit signalling the fact by ordinary means, the following signals are to be used:

By Day – Hoist 8 pennant (International Code) and make a succession of 8's by flashing and sound signal.

By Night – Fire green Very light or green rocket and make a succession of 8's by flashing and sound signal.

These signals should be regarded as alarm signals, and should therefore be used only in cases of great urgency where the vessel observed is undoubtedly hostile. They should at once draw the fire of the Examination Battery on the vessel and the Examination Vessel should keep out of the line of fire from it and other batteries.

69. Should it be necessary for an alarm signal to be made by the boarding examining officer, or by men in his boat alongside the vessel boarded, a green Very light is to be used, the Examination Vessel repeating the signal by the same means. The battery, however, should not wait for such repetition.

70. In order to minimize damage, should fire be opened on a ship which subsequently is found to be friendly, the following signal will be made by the Examination Vessel for "cease firing":

By Day — Hoist 4 pennant (International Code) and make a succession of 4's by flashing and sound signal.

By Night — Make a succession of 4's by flashing and sound signal; the flashing to be made on the largest signalling lantern available.

71. Other local signals may be laid down in the confidential traffic regulations to distinguish which of two or more ships are referred to by the signals in paragraphs 67 to 70 inclusive. Such indicating letters should be made *to the Examination Battery prior to the order to "open fire."*

Closing of Ports

72. Ports may be closed to all or certain classes of vessels when the safety of the port or the exigencies of the service require, but as a general rule they should never be closed to minor war vessels, fleet auxiliaries, military transports and hospital ships.

73. At ports where controlled mine fields are laid as a protection for ships in the harbor against submarine attack, it is usually necessary in thick weather either to put the mine field to "safe" or to close the port to all classes of vessels. This must be taken into account when framing the traffic regulations and deciding when to close the port.

74. Some of the occasions for closing the port may be:

- (A) Night — As a general rule this is advisable at Naval ports and may
- (B) Fog be extended to all ports in areas in which enemy raids are threatened.
- (C) ----- Temporary suspension of the examination service due to bad weather, mishap of the examination vessel, etc.
- (D) ----- Approach mined or obstructed.

Authority for closing the port is vested in the Local Senior Naval Officer.

75. Before declaring a port closed the risk of hostile submarines or air activity must be weighed against the security to be gained. This applies especially where the examination anchorage is not protected by net or boom defense or when due to bad weather the examination vessel is unable to remain on station.

76. The following universal signals indicate that a port is closed, and that merchant vessels are not permitted to proceed inward of Examination Anchorage or any other defined area.

By Day – 3 red balls to be hoisted vertically by the Examination Vessel. This signal may also be displayed from lighthouses, light vessels or other positions ashore or afloat appropriately located to be observed by incoming vessels.

By Night – 2 red lights in place of the 3 white lights which are normally the examination vessel's distinguishing lights. This signal may also be displayed from other appropriately located positions as indicated for day. Display of these lights at night will, however, be governed by whatever lighting restrictions are in force.

Display Signal and Special Signal

77. The entry of ships which must be examined before entering, is based on their identification to the *batteries* by means of:

(A) The Display Signal held by all minor war vessels.

(B) The Special Signal given to merchant vessels which have been inspected and passed by AXO.

The Display Signal for each day is made up locally and consists of the following:

By Day – A combination of two of the following shapes hoisted vertically:
Cone – point up
Cone – point down
Ball

By Night – A combination of two of the following colored lights hoisted vertically and flashed:
Red
White
Green

78. The Special Signal by day will be a combination of International Code flags. It may be changed as often as necessary and, if considered advisable, need not be the same for consecutive ships. An arrangement which has been found to work satisfactorily, is to use a code letter as the first letter, and the consecutive of a selected word in rotation as the second letter of the special signal. The code letter and the selected word can be changed as often as considered necessary. Care must be taken that no letter is duplicated.

The Special Signal by night consists of an arrangement of 4 vertical lights, red and white, hoisted in a conspicuous place on board the incoming vessel; this signal must be changed every night, and as often during the night as considered necessary. As merchants ships usually have on board two red and two white lights, the Special Signal by night will consist of one of the following combinations:

White	White	Red	White	Red	Red
White	Red	White	Red	Red	White
Red	Red	Red	White	White	White
Red	White	White	Red	White	Red

Care must be taken to employ no combination for which there may be some local recognized signification.

79. The Captain of the Port will see that the *Examination Battery* and Vessel and all persons concerned are informed of these signals and any changes which are made in them.

80. Examining Officers are responsible that the correct Special Signal is hoisted, and are to warn incoming vessels to shake out the flags of the Special Signal on still days, so that they may be clearly visible to the *Examination Battery*. They should also direct that the lights of the special signal by night are hoisted where they will not be obscured by smoke. The Special Signal must remain displayed by the incoming ship until she has passed beyond the fixed defenses. It is the duty of the examining officer to warn the master when to lower the signal.

81. The entry of local fishing boats, etc., unprovided with flags or lanterns with which to make the Special Signal should be controlled by special regulations.

Personnel Assigned to Conduct Examination of Vessels

82. The personnel assigned to the conduct of examination of incoming vessels which are required to be examined before entry are a part of the organization under the jurisdiction of the Captain of the Port. This personnel, including the Captain of the

Port, should, so far as it is practicable, be Coast Guard personnel because of their greater familiarity and knowledge of shipping in general and particularly that of entering the port.

83. The Examining personnel consists of the Captain of the Port (Chief Examining Officers – CXO) and such other officers (Assistant Examining Officers – AXO) as required, augmented if necessary by enlisted personnel to assist in the conduct of actual examination, and armed guards for vessels requiring them. One or more of the Assistant Examining Officers and such enlisted assistants as necessary must be continuously on duty in the Examination Vessel. Armed guards may be provided by Army authorities, or they may be Navy personnel according to mutual agreement locally between the Army and Navy authorities.

Pilotage

84. Pilotage should normally be made compulsory for all merchant vessels from the Examination Anchorage or other prescribed limits inland.

Notices to be Issued on the Enforcement of the Merchant Shipping Procedure

85. On the Merchant Shipping Procedure being put into force, the following should be at once issued:

- (A) Public Traffic Regulations.
- (B) If considered necessary, an individual notice to ship-owners and shipping agents calling attention to the main points of the Public Traffic Regulations.
- (C) Notice to Mariners.

Incoming Minor War Vessels

86. The Examination Vessel will close any unidentified minor war vessel which approaches and will employ the "challenge" procedure similar to that laid down for H.E.C.P. challenging major warships. The minor war vessel will reply by use of the display signal (see par. 77). The Examination Vessel will keep H.E.C.P. informed of the movements of minor war vessels.

87. Should the examination vessel not be on station, H.E.C.P. may challenge in her place.

Prizes

88. Prizes will be in charge of a naval officer and a prize crew. When accompanied by a U.S. or allied major warship, the Examination Vessel is not concerned. When unaccompanied by such a warship, they are to be dealt with as merchant vessels.

Incoming Neutral and Allied War Vessels, and Hostile War Vessels Bearing Flags of Truce

89. It is highly improbable that any neutral war vessels will, in time of war, approach a controlled port without previous notification. If circumstances render it necessary for a neutral war vessel to enter a controlled port, H.E.C.P. should be informed of her characteristics, expected time of arrival, etc. Such vessels are to be identified in the same manner as merchant vessels, and may be passed in by day. They should not be admitted by night without special permission of the Local Senior Naval Officer.

90. Allied war vessels not supplied with U. S. Recognition Signal, are identified and admitted by the Examining Officer.

91. A hostile war vessel desiring to treat under a flag of truce would probably lie off outside gun range of the port, and either send in a boat or wait until one is sent out to her or until communication is established by signal with the shore.

92. In the event of her continuing to approach the port, the signal, "stop instantly" should be made to her, both from H.E.C.P. and the Examining Vessel, a projectile being fired across her bow if signal is disregarded. Failing then to stop, she should be treated as hostile.

Incoming Fishing and Other Small Craft

93. At ports used by fishing fleets and other small craft in large numbers, special arrangements should be made for their entry. They should all be identified before being allowed to proceed up harbor. For this purpose, it may be found advisable to have special launches to assist the Examining Vessel at certain hours of the day.

94. In order to facilitate the entry of fishing or other small vessels where their numbers are large, it is recommended that the Examining Vessel carry a member of the fishing community, or other person, who can identify the masters of such vessels. It is further recommended that inshore fishing vessels be given a special signal, changed

periodically, to be flown continuously whilst within the controlled area. This will not exempt them from closing the Examination Vessel/or launch before being allowed to proceed into harbor.

95. In this connection, small boats and craft up to 40 tons gross, fishing the waters close to their home port or fishing base and being seldom more than 24 hours at sea, are known as Inshore Fishing Vessels. All others are defined as Deep Sea Fishing Vessels.

96. Deep Sea Fishing vessels will be subject to the examination in force for merchant vessels.

ANNEX "A"

DISTRICT	STATION	LOCATION	GEOGRAPHICAL COORDINATES	REMARKS
1	HECP Argentina	Newfoundland		To Be Est.
1	HECP Portland	Fort Williams	Lat. 43-37-15 N. Long. 70-13-00 W.	
1	HECP Portsmouth	Ex-Coast Gd. Station	Lat. 43-02-30 N. Long. 70-42-00 W.	
1	HECP Boston	Fort Dawes	Lat. 42-21-30 N. Long. 70-57-30 W.	
1	HECP Newport	Beavertail	Lat. 41-27-00 N. Long. 71-24-00 W.	
3	HECP Fishers Isl.	Fort H.G. Wright	Lat. 41-15-22.8 N. Long. 72-01-23.9 W.	
3	HECP Staten Isl.	Fort Wadsworth	Lat. 40-36-15 N. Long. 74-03-22 W.	
4	HECP Delaware	Cape Henlopen	Lat. 38-47-39 N. Long. 75-05-32 W.	
5	HECP Norfolk	Just Outside Fort Story	Lat. 36-55-48 N. Long. 76-00-42 W.	
6	HECP Charleston	Fort Moultrie	Lat. 32-45-33 N. Long. 79-51-31 W.	
7	HECP Key West	Key West		To Be Est.
8	HECP Santa Rosa Island	Fort Pickens	Lat. 30-19-30 N. Long. 87-17-30 W.	

DISTRICT	STATION	LOCATION	GEOGRAPHICAL COORDINATES	REMARKS
8	HECP Galveston, Texas	Fort Point	Lat. 29-20 N. Long. 94-44-37 W.	To Be Est.
10	HECP San Juan	San Juan, P.R.	Lat. 18-28 N. Long. 66-07 W.	
11	HECP California	San Diego	Lat. 32-40-19 N. Long. 117-14-24 W.	
11	HECP California	San Pedro	Lat. 33-42-42 N. Long. 118-17-32 W.	
*12	HECP California	Station "H" Fort Winfield Scott, San Francisco	Lat. 37-48-08.3 N Long. 122-28-32.7 W.	
13	HECP Columbia River Area	Fort Canby		To Be Est.
13	HECP Puget Sound Area	Fort Worden	Lat. 48-08-30 N. Long. 122-46-00 W.	To Be Est.
14	HECP Pearl Harbor	N.Y. P.H.	Lat. 21-21-11.9 N. Long. 157-57-26.2 W.	
15	HECP Cristobal	Fort Sherman	Lat. 9-22-00 N. Long. 79-57-00 W.	
15	HECP <i>Balboa</i>	Fort Amador	Lat. 8-55-00 N. Long. 79-31-00 W.	
** 16	<i>HECP Manila Bay</i>	<i>Fort Mills Corregidor</i>	<i>Lat. 14-22-59 N. Long. 120-34-23 E.</i>	

* There are two (2) Signal Stations connected with HECP San Francisco:

1. Fort Point
2. Point Bonita

** Coordinates of Signal Station for HECP Manila Bay:

Lat. 14^o-23'-59" N.
Long. 120^o-36'-09" E..

Except as noted, HECP Signal Station is connected physically with its HECP.

ANNEX "C"

UNITED STATES MAJOR WAR VESSELS

Destroyer TendersAD	Aircraft Escort
Ammunition ShipsAE	VesselsAVG
Provision Store ShipsAF	Seaplane Tenders
Auxillaries MiscAG	(small)AVP
(ALCOR, ARGONNE, BEAR, SEMMES, UTAH and WYOMING only)	BattleshipsBB
Cargo ShipsAK	Heavy CruisersCA
General Stores Issue ShipsAKS	Large CruisersCB
Mine SweepersAM	Light CruisersCL
Fleet Net VesselsAN	Mine LayersCM
OilersAO	Aircraft CarriersCV
Transports (operated by	Seaplane CarriersCVS
U.S. Navy)AP	DestroyersDD
Transports (Destroyer)APD	Destroyer LeadersDL
Aircraft TransportAPV	Light Mine LayersDM
Repair Ships (Fleet	Mine Sweepers, High
Repair Ships only)AR	SpeedDMS
Submarine TendersAS	GunboatsPG
Ocean-going TugsAT	(ERIE and CHARLESTON only)
Seaplane TendersAV	SubmarinesSS and
Seaplane Tenders	SM
(Destroyer)AVD	Ocean-going Coast Guard
	cutters when operating
	under U.S. Navy.

UNITED STATES MINOR WAR VESSELS

Auxiliaries MiscellaneousAG	(those not listed above)
Hospital ShipsAH	
Coastal Mine SweepersAMc	
Barracks ShipsAPL	
Base Repair ShipsARb	
Salvage VesselsARS	
Submarine Rescue VesselsASR	
Salvage TugsATS	
Coastal Mine LayersCMc	
Submarine ChasersPC	
Eagle BoatsPE	
GunboatsPG	(Except Charleston & Erie)
Motor Torpedo BoatsPT	
Patrol Vessels, YachtsPY	
Patrol Vessels, Yachts, CoastalPYc	
District Miscellaneous AuxiliariesYAG	
District Motor MinesweepersYMS	
District Net VesselsYN	
District Patrol VesselsYP	
Harbor TugsYT	

ANNEX "D"

COMMUNICATIONS:

H.E.C.P.	ACTION	INFORMATION
Argentia, Newfoundland	N.O.B. Argentia	
Portland, Maine	Com One	
Portsmouth, N. H.	Com One	Comdt. N.Y. Portsmouth, N.H.
Boston, Mass.	Com One	
Newport, R. I.	Com One	N.O.B. Newport
Fishers Island, N.Y.	Com Three	
New York (Staten Isl.)	Com Three	
Delaware (Cape Henlopen)	Com Four	
Norfolk, Va.	Com Five	
Charleston, S. C.	Com Six	
Key West, Fla. (to be established)	Com Seven	N.O.B. Key West
Santa Rosa Isl. (Pensacola, Florida)	Com Eight	Comdt. N.A.S. Pensacola
Galveston, Texas	Com Eight	
San Juan, P. R.	Com Ten	
San Diego, Cal.	Com Eleven	
San Pedro, Cal.	Com Eleven	
San Francisco, Cal.	Com Twelve	
Columbia River (to be established)	Com Thirteen	
Puget Sound Area (to be Est.)	Com Thirteen	
Pearl Harbor, T.H.	Com Fourteen	
Cristobal, C.Z.	Com Fifteen	
Balboa, C.Z.	Com Fifteen	
Manila Bay, P. I.	Com Sixteen	

APPENDIX B

“Chief of Coast Artillery’s Comments on Advanced Copy of ‘Instructions for the Examination and Entry into United States Ports in Time of War.’ ”

Subject: Comments on Advance Copy of “Instructions for the Examination and Entry into United States Ports in Time of War.”

1. Reference is made to:

a. “Mission, General Operation and Desirable Location of a Harbor Entrance Control Post” approved by the Chief of Naval Operations, May 29, 1941, and the Chief of Staff, June 23, 1941.

b. Letter subject “Joint Defense of Harbors” to the Commandants, all Naval Districts dated the Office of the Chief of Naval Operations, November 5, 1940, (OP-3081-WG[SC] a 16 [A&N] Serial 041230).

c. Memorandum – “Miscellaneous Information Concerning Use of Controlled Mines during War.” copy attached.

2. The following comments refer to the indicated portions of the Subject – “Instructions.”

a. Definitions and paragraph 1 page 1.

(1). The definition of a harbor entrance control post is not in accordance with reference 1 a and b above. The War Department visualizes the harbor entrance control post as the joint command post of the Army and Navy forces charged with the defense of the harbor and not as a mere “watch-keeping station.”

(2). Reference 1 b specifically defines the harbor entrance control post as “a joint control station,” “the nerve center of the system,” “empowered to initiate coordinated action of the Army and Navy forces under control of the station.” It specifies the “forces directly controlled” as including “underwater defenses, harbor batteries, antiaircraft units, patrol vessels, coastal vessels, balloon barrages, mine sweepers, Army antiaircraft batteries, Navy antiaircraft weapons, Army harbor defense batteries, fixed or mobile,

and antiaircraft batteries of fleet vessels." The quoted portions of this reference, together with Inclosure "A" of the reference, which is a diagram of command lines and intelligence channels, leave no doubt that the Chief of Naval Operations conceives the harbor entrance control post as a joint command post for Army and Navy action in defense of a harbor.

(3). Reference 1 a, issued jointly by the Chief of Naval Operations and Chief of Staff subsequent to reference 1 b specifically states in confirmation of the above: "The harbor entrance control post is visualized as one continuously manned by an officer of both the Army and Navy and the necessary assisting personnel for clerical and communication duties, where the Army and Navy officers are the Senior Local Commanders of their respective services, or their direct representatives with authority to take the action necessary to accomplish the mission as stated above." The fact that the Senior Army and Navy commanders, or their direct representatives empowered to take action in their absence, are to be present in the harbor entrance control post definitely establishes its status as a command post and cannot admit of its being considered as a mere "watch-keeping station."

(4). The definition of a harbor entrance control post appearing on the page headed "Definitions" should be changed to read substantially as follows:

"H.E.C.P. — Harbor Entrance Control Post. The joint Army and Navy Command Post of the forces charged with defense of a harbor."

(5). The following definition should be added:

"H.E.C.P. Signal Station — The station charged with communicating with vessels by visual means and with challenging vessels approaching the harbor entrance.

(6). The second sentence of paragraph 1 page 1 should be changed to read substantially as follows: "This H.E.C.P. is a joint Army and Navy command post whose mission is to collect and disseminate information of activities in defensive sea areas; to control unescorted merchant shipping in the defensive coastal area; and to take prompt and decisive action to operate the elements of the harbor defense; in order to deny enemy action within the defensive coastal area."

b. Paragraph 2. Suggest wording as follows: "The Army and Navy officers on duty in the H.E.C.P. will be the Senior Local Commanders of their respective

services or their direct representatives empowered to take action in their absence."

c. Paragraph 16. In the fourth sentence beginning at the bottom of page 2, delete the words "the Army Commander of Harbor Defenses." Since the harbor defense commander or his direct representative is on duty in the harbor entrance control post this notification appears to be superfluous.

d. Paragraph 21. In the second sentence delete the words "The naval watch-keeping officer at * * * the Army Commander of Harbor Defenses through the Army watch-keeping officer, * * * the local Senior Naval Officer." In the third sentence delete the words: "Unless directed by proper authority, the naval watch-keeping officer will, * * * and that the batteries have been instructed not to fire, direct the signal station to grant," and add the following at the end of the sentence "will be transmitted to the ship by visual means."

e. Paragraph 24. In the first sentence delete the following words: "* * * the naval watch-keeping officer at * * * through the Army watch-keeping officer * * * Army Commander of the Harbor Defenses, * * * the local Senior Naval Officer, * * *."

f. Paragraph 39. Delete the words "* * * which will request the Army Commander, Harbor Defenses, through the Army watch keeping officer to have * * *" substituting therefor the words "and the Army officer on duty thereat will direct" and inserting the word "to" between "battery" and "bring-to."

g. Paragraph 43. Delete the sentence "The naval watch keeping officer, through the Army watch keeping officer, will inform the Army Commander of Harbor Defenses, and the Examination battery and Captain of the Port," substituting the sentence "The Examination Battery and the Captain of the Port will be informed."

h. Paragraph 46. Delete the words "* * * the Naval watch keeping officer at the H.E.C.P. will request that * * * this request being transmitted through the Army watch keeping officer.", and insert the word "will" between the words "she" and "be."

i. Paragraph 55. In the first sentence substitute "H.E.C.P." for "Examination Battery."

j. Paragraph 59. In the first sentence substitute the words "Harbor Defense Commander" for "Commander of Harbor Defenses."

k. Paragraph 60. In the third sentence substitute the word "non-explosive" for "plugged."

l. Paragraph 61. Delete the first sentence.

m. Paragraph 62.

(1). In the first sentence delete the words "the H.E.C.P. or." The Army officer on duty in the harbor entrance control post can order fire when necessary.

(2). Subparagraph 2. Change the first sentence to read as follows: "Should a vessel disregard a warning shot across the bow, responsibility rests with the Army to take such action as is necessary in the circumstances." In the third sentence delete the words "the battery should not open fire" substituting therefor the words "destructive fire should not be delivered."

n. Paragraph 63. Delete the words "It is presumed that."

o. Paragraphs 65 and 66. These paragraphs indicate that there will be direct visual signalling between the Examination vessel and Examination Battery. It appears to be advisable for officers and key enlisted personnel of the Examination Battery to be familiar with the signals prescribed, particularly the "alarm" and "cease firing" signals, however all signalling should be accomplished through the harbor entrance control post from which the orders to fire will be given in all cases except when the "alarm" signal is given. Therefore in these two paragraphs "H.E.C.P." should be substituted for the words "Examination Battery" (or Batteries) wherever the latter occur.

p. Paragraph 71. In the last sentence delete the words "to the Examination Battery prior to the order to 'open fire' " substituting therefor the words "prior to the request for fire support."

q. Paragraph 73. Inasmuch as the controlled submarine mine is of particular effectiveness when, due to poor visibility, visual surveillance of the harbor is impossible, the mine field should not be set "safe" at such times except for brief periods when a friendly vessel is passing in or out. The decision as to whether or not to set the mine field "safe" is vested in the harbor defense commander.

r. Paragraph 77. Substitute "H.E.C.P." for "batteries."

s. Paragraph 79. Substitute "H.E.C.P." for "Examination Battery."

t. Paragraph 80. In the first sentence, substitute "H.E.C.P." for "Examination Battery."

u. Annex A.

(1) The note at the bottom of page 2 is misleading and unnecessary. Many of the signal stations listed are not physically a part of their harbor entrance control post.

(2) Since the harbor entrance control post proper is a joint command post which should be given concealment and cover from hostile action, the geographic coordinates should be omitted. The station column should be revised to read "H.E.C.P. Signal Station" instead of "H.E.C.P."

(3) There is listed on page 2 a "H.E.C.P. Manila Bay" and on page 2 of Annex B a "Fort Mills Signal Station (Army)" both located at Fort Mills, Corregidor. The need for this duplication is not apparent.

(4) The Harbor Entrance Control Post Signal Station, Balboa is located at Fort Grant, Flamenco Island, and not at Fort Amedor.

v. Annex D. International visual call signs have been assigned to most of the Army signal stations which are now part of the Harbor Entrance Control Posts. It is believed that these call signs should be used or rescinded. It is believed that this matter is of primary interest to the Chief Signal Officer.

3. The defense of a fortified harbor is a joint mission of the Army and Navy. The responsibility for examination and passage of vessels into the harbor is vested in the Navy, the actual defense of the harbor against hostile attack is the responsibility of the Army, with the support of local Naval defense forces. Since the inclosed paper deals primarily with that portion of the mission which is the primary responsibility of the Navy, its publication by the Navy is believed proper. However, since the paper does prescribe certain action by the Army, it should have the approval of the Secretary of War prior to publication. It appears from the statement in paragraph 1 inclosed letter from the Chief of Naval Operations that this prior approval is impossible. It is believed desirable to bring the above comments to the attention of the Navy Department with a view to revision in order that the full approval of the Secretary of War may be possible prior to the next publication of this document.

4. The reference cited in paragraph 1 c, above, contains certain operating procedure for controlled mine fields. If the inclosed paper is to be reissued as a joint

publication of the Army and Navy it is believed that the instructions given therein should be included in the revised publication in order that local naval personnel may be familiar with the operational procedure for controlled mines.

5. It is recommended that the comments appearing above be brought to the attention of the Chief of Naval Operations with a view to the revision and reissue of the inclosed paper as a joint Army and Navy publication.

For the Chief of Coast Artillery:

C. E. COTTER
Colonel, C.M.C.,
Assistant.

3 Incls. (1 added).

Incl. No. 3 — Cpy of ltr. from GHO
dated 11-E-61 (OCCA 660.3/
26-C-7-A Incl. 14).

Bibliography

Primary Sources

1. Manuscript Materials

In custody of National Archives and Suitland Records Center.

Annex "A," Mission of Harbor Defenses, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General, AG Registered Doc. No. 408 (a), National Archives, RG 407.

Annex "B," Mission of Harbor Defenses, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General, AG Registered Doc. No. 408 (a), National Archives, RG 407.

Annex "C," Mission of Harbor Defenses, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General, AG Registered Doc. No. 408 (a), National Archives, RG 407.

Annex "E," Antiaircraft Artillery, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General, AG Registered Doc. No. 408 (a), National Archives, RG 407.

Annex "F," Gas Defense, Annexes to Harbor Defense Project, Harbor Defenses of Charleston, Records of the Adjutant General, AG Registered Doc. No. 408 (a), National Archives, RG 407.

Annex "G," Equipment, Annexes to Harbor Defenses of Charleston, Records of the Adjutant General, AG Registered Doc. No. 408 (a), National Archives, RG 407.

Assistant Adjutant General to Commanding General, Southern Defense Command, December 20, 1941, National Archives, RG 165.

Bogart to Assistant Chief of Staff, Operations Division, War Department, December 29, 1945, National Archives, RG 165.

Bowen to Chief, Coast Artillery, May 5, 1941, (CAB 665) (C of E 665-504) (CWS 660.21 114) (5-5-41) (OCCA 665. 2/J), National Archives, RG 165.

Chief, Bureau of Ships, to Commandants, Sixth and Eighth Naval Districts, October 26, 1941, and March 18, 1942, National Archives, RGs 407 and 165.

Chief, Coast Artillery to Adjutant General, September 18, 1941, National Archives, RG 165.

Chief, Coast Artillery to Adjutant General, December 1, 1941, National Archives, RG 165.

Chief of Naval Operations to Commandant, 12th Naval District, June 23, 1941, National Archives, RG 407.

Commandant, Eighth Naval District, to Commanding General, 4th Coast Artillery District, undated, National Archives, RG 407.

Corey to Commanding General, Eastern Defenses, May 22, 1944, File 600.6, Suitland Records Center, RG 77, Fort Moultrie, South Carolina.

Headquarters, 4th Coast Artillery District to Commanding Officer, Harbor Defenses, Galveston, December 11, 1941, National Archives, RG 407.

Headquarters, Southern Defense Command to Adjutant General, October 29, 1941, National Archives, RG 165.

Minutes of Meeting of Local Joint Planning Committee, Carolina Sector, Southern Coastal Frontier, August 5, 1941, National Archives, RG 165.

"Notes on Type Harbor Defense Installations," prepared in Office of Chief, Coast Artillery (AG 666.2[2-3-41] M-WPD) (OCCA 662/ FD-1, inclosure 1), National Archives, RG 165.

Proceedings of Meeting of Local Joint Planning Committee, Pensacola, Florida, September 21, 1941, National Archives, RG 407.

Records of the Adjutant General's Office, Classified Correspondence, 1940-42, AG 660.2 (5-29-41 Section 1), National Archives, RG 407.

Service, Supply and Procurement Division, Installations Branch, Harbor and Coastal Defense Decimal File, 1914-46, 660.3/36-B-3, National Archives, RG 165.

Service, Supply and Procurement, Service Group, Installations Branch, Harbor and Coastal Defense Decimal File, 1914-46, 660.3/AJ-1&2, National Archives, RG 165.

In custody of Naval History Division, Washington Navy Yard, Washington, D.C.

War Diary, March 10 - December 7, 1941, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, December 7-31, 1941, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, January 1942, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, February 1942, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, March 1942, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, April 1942, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, May 1942, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, June 1942, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, September 1942, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, October 1942, Eastern Sea Frontier, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, March 1942, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, April 1942, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, May 1942, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, July 1942, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, August 1942, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, September 1942, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, October 1942, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, March 1943, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, September 1943, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, January 1944, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, March 1944, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, June 1944, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, September 1944, Operations Archives, Naval History Division, Washington, D.C.

War Diary, Sixth Naval District, October 1944, Operations Archives, Naval History Division, Washington, D.C.

2. Published

"Headquarters and Headquarters Battery, Harbor Defenses, T/O & E4 -260-1, 63, September 28, 1944," Records of the Adjutant General, General Correspondence, 1940-45, AG 320.3 (23 Feb. 44), National Archives, RG 407.

"Tables of Organization and Equipment No. 4-200-1, War Department, Washington D.C., April 11, 1944, Headquarters and Headquarters Battery, Harbor Defenses," Washington, 1944.

Plans and Drawings on File at Fort Sumter National Monument

"Air Conditioning Installation at S.E. S.E.F., Sullivan's Island, S.C., April 1963," files Fort Sumter National Monument.

"Fort Moultrie Test and Calibration Facility (Formerly Harbor Entrance Control Post), May 1964," files Fort Sumter National Monument.

"Harbor Defenses of Charleston, HDCP-HECP, General Plan," and "Architectural Details," Fort Moultrie, South Carolina, files Fort Sumter National Monument.

"New 6' Chain Link Fence at Electronics Facility – Fort Moultrie Reservation, Sullivan's Island, S.C.," January 11, 1962, files Fort Sumter National Monument.

"Rehabilitation of HECP Fort Moultrie, Sullivan's Island, S.C., Plans, Elevations and Details," files Fort Sumter National Monument.

"Repairs to Test and Calibration Facility, Sullivan's Island, S.C., June 17, 1960," files Fort Sumter National Monument.

Correspondence with Staff Fort Sumter National Monument

Baker, Mel, to E. C. Bearss, October 18, 1973.

Dennis, J.M., to E. C. Bearss, October 18, 1973.

Harris, William, to E.C. Bearss, October 18, 1973.

Reminiscences and Memoirs

Doenitz, Karl, *Memoirs: Ten Years and Twenty Days*, translated by R. H. Stevens, in collaboration with David Woodward, Cleveland, 1958.

Secondary Sources

Clark, William Bell, *When the U-boats Came to America*, Boston, 1929.

Conn, Stetson, Rose C. Engelman, and Byron Fairchild, *U.S. Army in World War II – The Western Hemisphere, Guarding the United States and Its Outposts*, Washington, 1964.

Karig, Walter, Earl Burton, and Stephen L. Freeland, *Battle Report: The Atlantic War*, New York, 1946.

Morison, Samuel Eliot, *The Battle of the Atlantic, September 1939 - May 1943*, Boston, 1954.

Morison, Samuel Eliot, *The Two-Ocean War: A Short History of the United States Navy in the Second World War*, Boston, 1963.

Willoughby, Malcom F., *The United States Coast Guard in World War II*, Annapolis, 1957.

Personal Interviews

Budds, James C., with E. C. Bearss, September 14, 1973.

Glover, Ernest, with E. C. Bearss, September 14, 1973.

Sams, John B., with E. C. Bearss, September 14 and October 18, 1973.

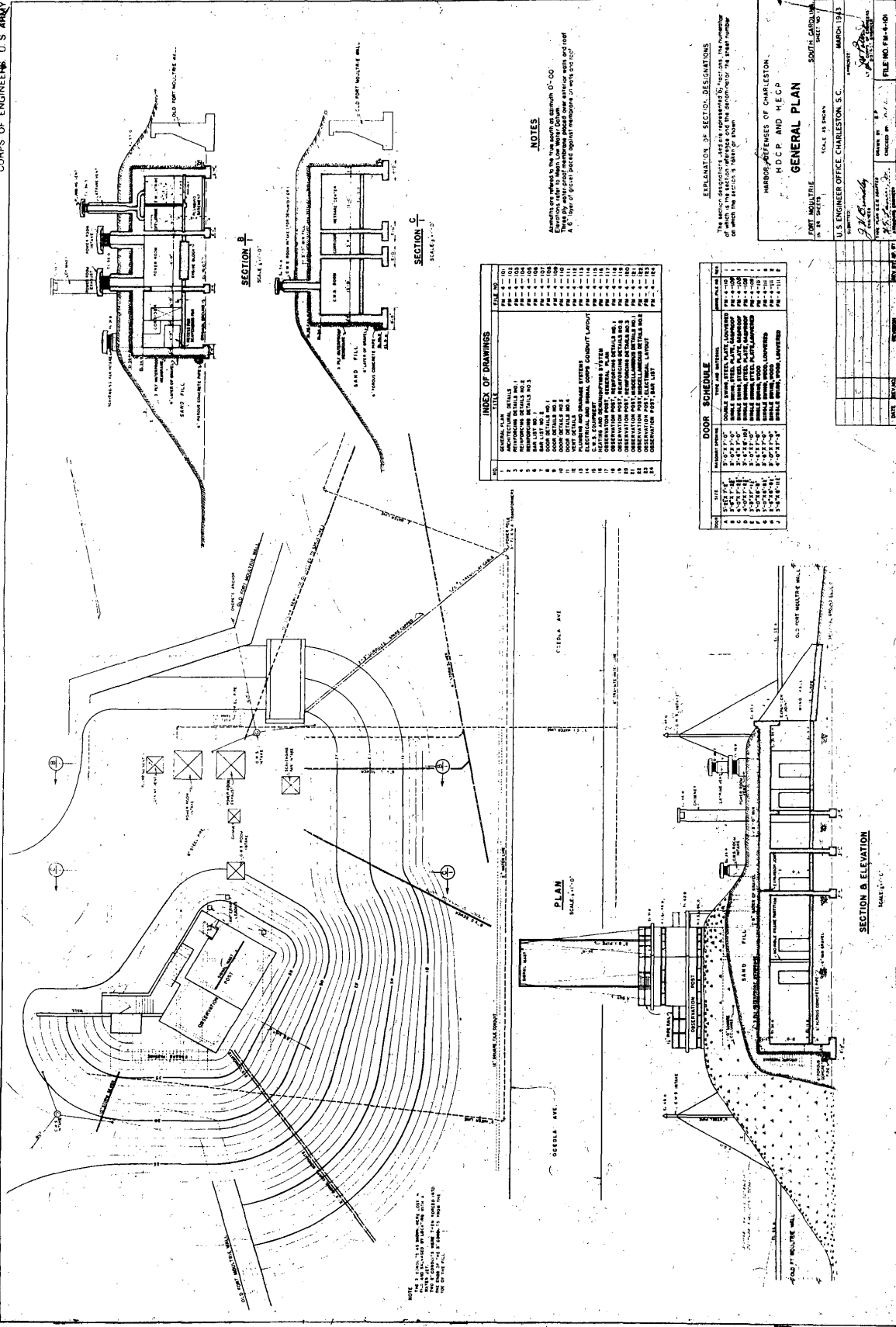
ILLUSTRATIONS

Plate I

General Plan "Harbor Defenses of Charleston, HDCP and HECF, Fort Moultrie, South Carolina, March 1943."

Plate II

Architectural Details, "Harbor Defenses of Charleston, HDCP and HECP, Fort Moultrie, South Carolina, March 1943."



INDEX OF DRAWINGS

NO.	TITLE	FILE NO.
1	GENERAL PLAN	PAE 4-100
2	SECTION A	PAE 4-101
3	SECTION B	PAE 4-102
4	DOOR SCHEDULE	PAE 4-103
5	EXPLANATION OF SECTION DESIGNATIONS	PAE 4-104
6	GENERAL PLAN	PAE 4-105
7	SECTION A	PAE 4-106
8	SECTION B	PAE 4-107
9	DOOR SCHEDULE	PAE 4-108
10	EXPLANATION OF SECTION DESIGNATIONS	PAE 4-109
11	GENERAL PLAN	PAE 4-110
12	SECTION A	PAE 4-111
13	SECTION B	PAE 4-112
14	DOOR SCHEDULE	PAE 4-113
15	EXPLANATION OF SECTION DESIGNATIONS	PAE 4-114
16	GENERAL PLAN	PAE 4-115
17	SECTION A	PAE 4-116
18	SECTION B	PAE 4-117
19	DOOR SCHEDULE	PAE 4-118
20	EXPLANATION OF SECTION DESIGNATIONS	PAE 4-119
21	GENERAL PLAN	PAE 4-120
22	SECTION A	PAE 4-121
23	SECTION B	PAE 4-122
24	DOOR SCHEDULE	PAE 4-123
25	EXPLANATION OF SECTION DESIGNATIONS	PAE 4-124

DOOR SCHEDULE

NO.	TYPE AND MATERIAL	FILE NO.
1	DOUBLE SWING STEEL FRAME, UNPAINTED	PAE 4-103
2	DOUBLE SWING STEEL FRAME, PAINTED	PAE 4-104
3	DOUBLE SWING WOOD FRAME, UNPAINTED	PAE 4-105
4	DOUBLE SWING WOOD FRAME, PAINTED	PAE 4-106
5	DOUBLE SWING ALUMINUM FRAME, UNPAINTED	PAE 4-107
6	DOUBLE SWING ALUMINUM FRAME, PAINTED	PAE 4-108
7	DOUBLE SWING BRASS FRAME, UNPAINTED	PAE 4-109
8	DOUBLE SWING BRASS FRAME, PAINTED	PAE 4-110
9	DOUBLE SWING IRON FRAME, UNPAINTED	PAE 4-111
10	DOUBLE SWING IRON FRAME, PAINTED	PAE 4-112
11	DOUBLE SWING STEEL FRAME, UNPAINTED	PAE 4-113
12	DOUBLE SWING STEEL FRAME, PAINTED	PAE 4-114
13	DOUBLE SWING WOOD FRAME, UNPAINTED	PAE 4-115
14	DOUBLE SWING WOOD FRAME, PAINTED	PAE 4-116
15	DOUBLE SWING ALUMINUM FRAME, UNPAINTED	PAE 4-117
16	DOUBLE SWING ALUMINUM FRAME, PAINTED	PAE 4-118
17	DOUBLE SWING BRASS FRAME, UNPAINTED	PAE 4-119
18	DOUBLE SWING BRASS FRAME, PAINTED	PAE 4-120
19	DOUBLE SWING IRON FRAME, UNPAINTED	PAE 4-121
20	DOUBLE SWING IRON FRAME, PAINTED	PAE 4-122
21	DOUBLE SWING STEEL FRAME, UNPAINTED	PAE 4-123
22	DOUBLE SWING STEEL FRAME, PAINTED	PAE 4-124

NOTES

1. EXPLANATION OF SECTION DESIGNATIONS: The section designations, as they appear on the drawings, indicate the number of which the section divides and the determining file number of such the section's design.

2. GENERAL PLAN: The general plan shows the location of the building on the site and the location of the various structures and features.

3. SECTION A: This section shows the interior of the building and the details of the various rooms and features.

4. SECTION B: This section shows the exterior of the building and the details of the roof and foundation.

EXPLANATION OF SECTION DESIGNATIONS

The section designations, as they appear on the drawings, indicate the number of which the section divides and the determining file number of such the section's design.

GENERAL PLAN

HARBOR DEFENSE OF CHARLESTON, S.C.
H.C.P. AND H.C.P.

SCALE: AS SHOWN

U.S. ENGINEER OFFICE CHARLESTON, S.C.

DATE: MARCH 1913

DESIGNED BY: J. H. ...

CHECKED BY: ...

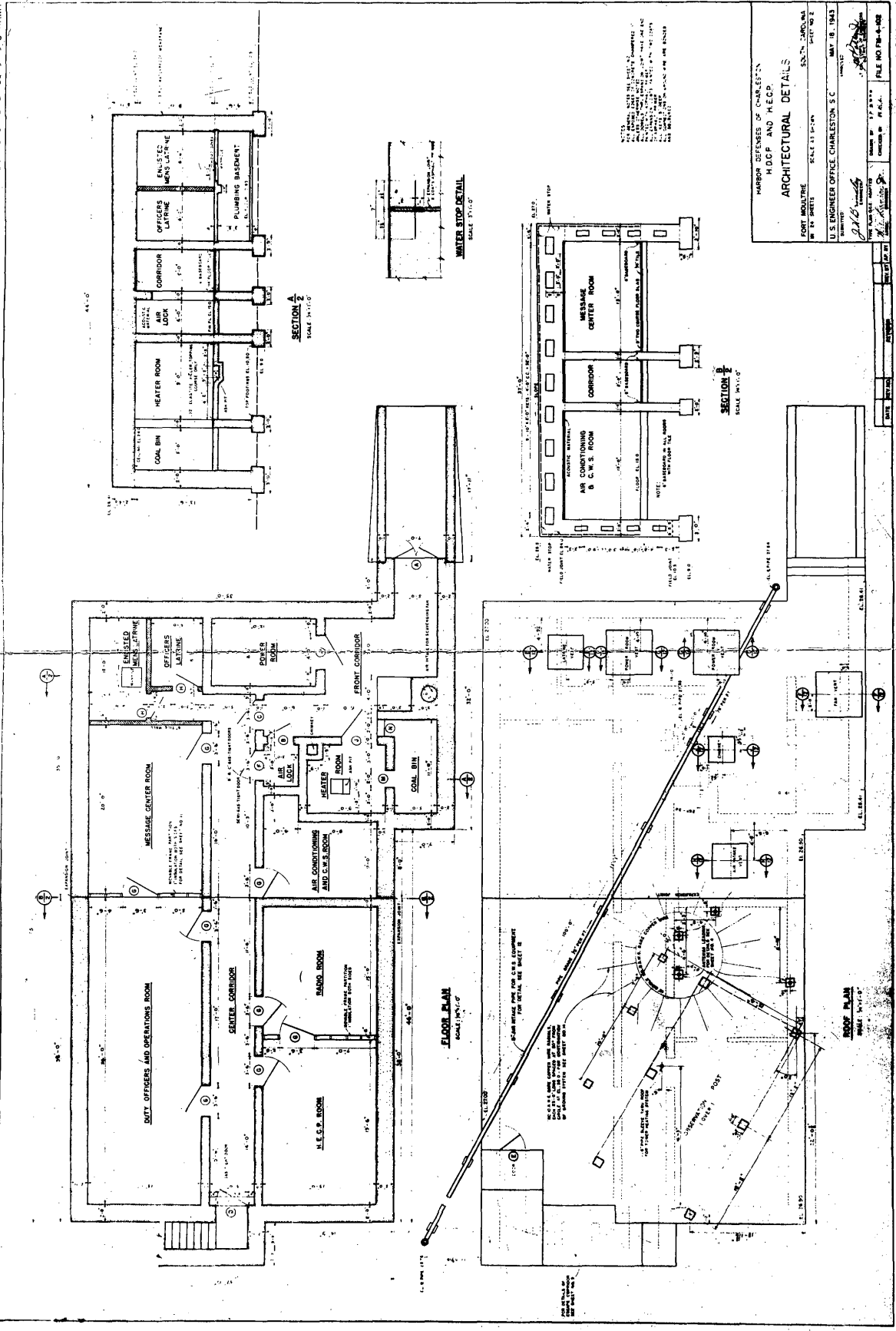
FILE NO. PAE 4-100

ONTIMICROFILM

392/28,000
SHT 1

Plate III

The south elevation of the combined HECF-HDCP and Signal Tower at Fort Moultrie, 1941-44. Note the flag hoists, signal flags, and positions of the blinker lights and telescope. Courtesy U.S. Army, SC 294499.



HARBOR DEFENSE OF CHARLESTON
 HOOP AND HEEP
 ARCHITECTURAL DETAILS
 FORT MOULTRIE SCALE 1/8" = 1'-0"
 U.S. ENGINEER OFFICE CHARLESTON, S.C. DATE 18, 1943
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 FILE NO. FM-4-42

392/2800
 SAT 2
 ON MICROFILM

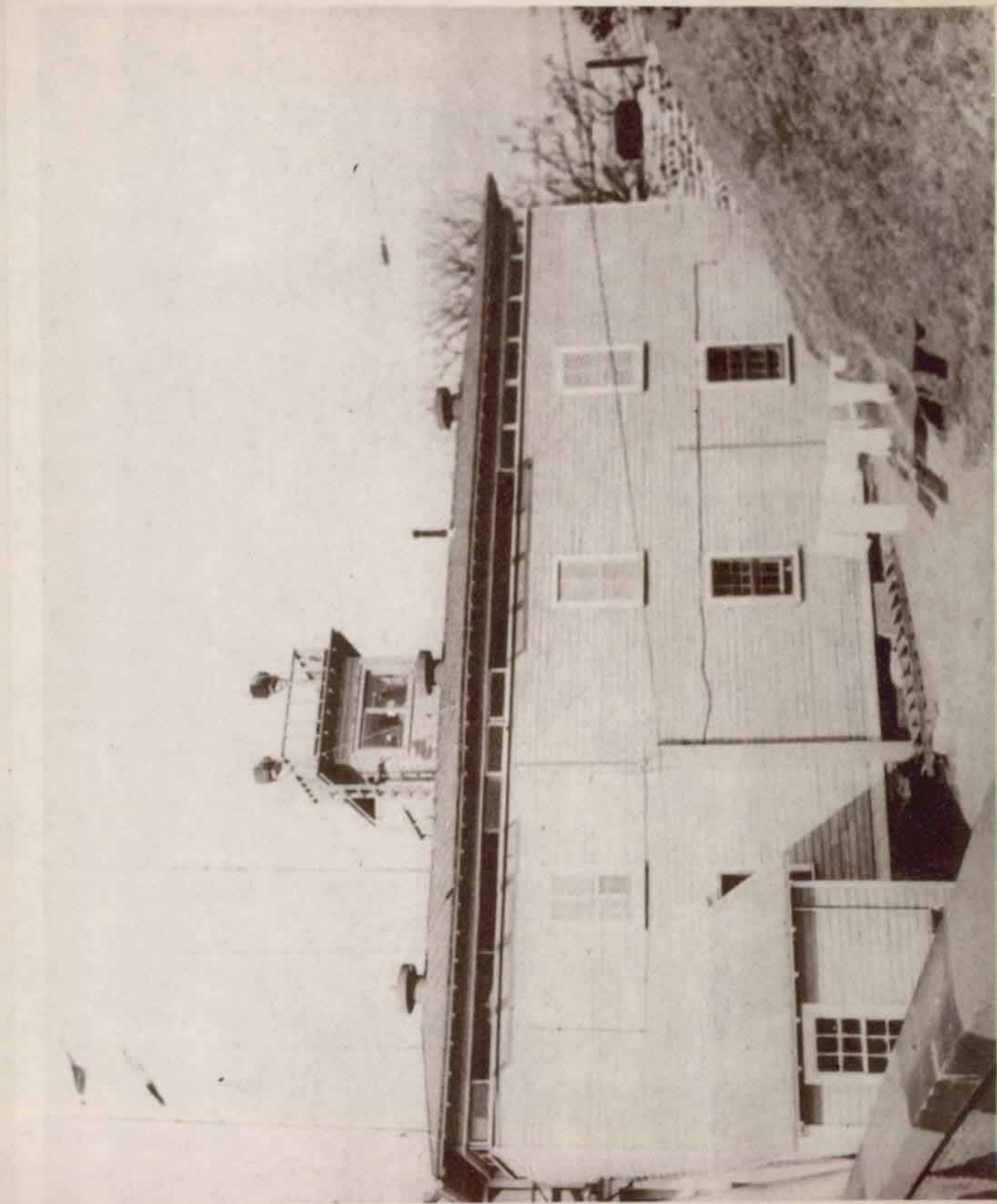


Plate IV

Signalman Budds manning the southeast blinker light atop the Signal Tower, c. 1942.
Courtesy James C. Budds of 11 Lyttleton Avenue, Charleston, South Carolina.



Plate V

Signalman Budds at the 50-power telescope at the southwest corner of the Signal Tower, c. 1942. Courtesy James C. Budds of 11 Lyttleton Avenue, Charleston, South Carolina.

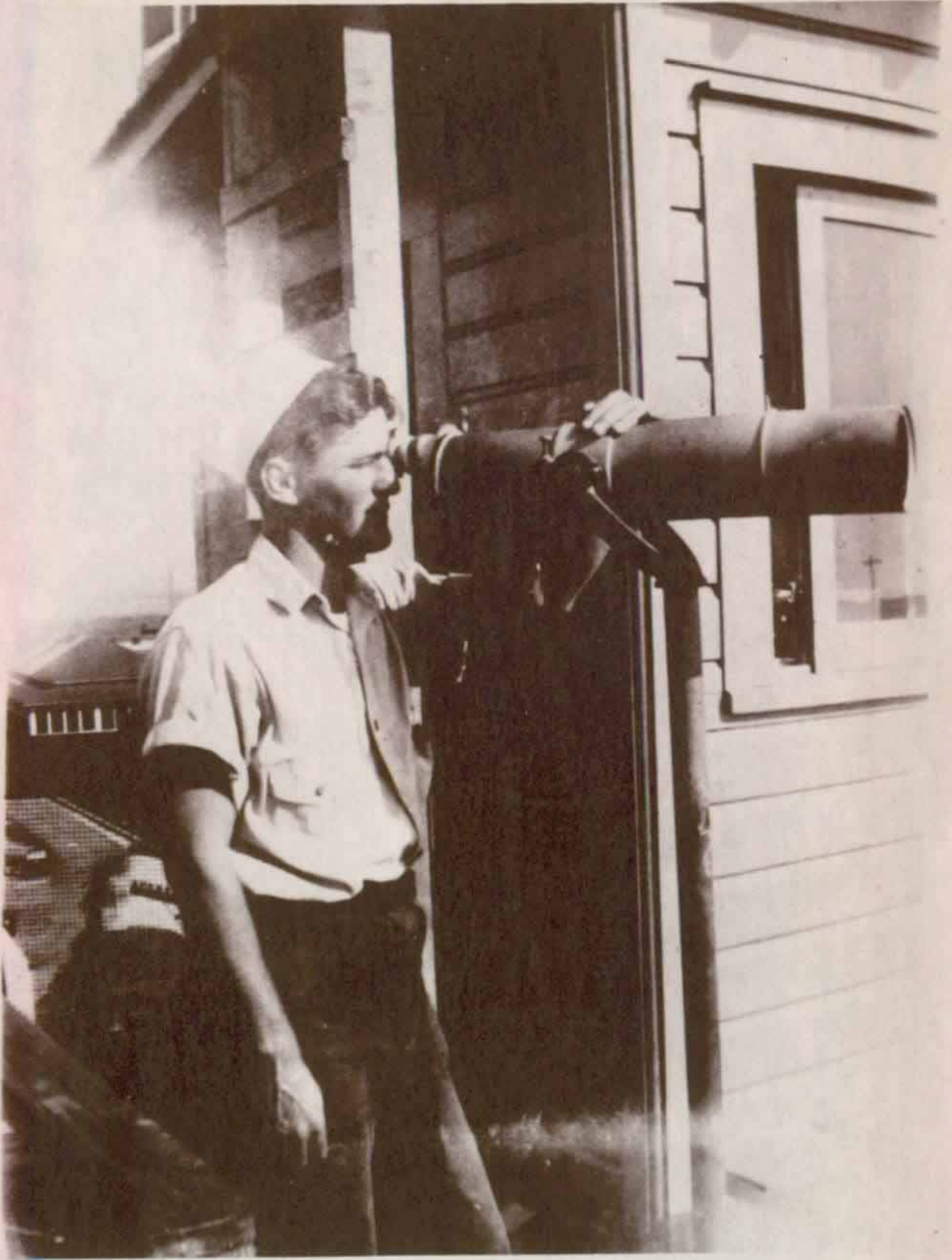


Plate VI

Message Center Room at combined HECF-HDCP Fort Moultrie, 1941-44. In March 1944 this equipment and the furnishings were moved into the Message Center Room of the new HECF-HDCP. Courtesy U.S. Army, SC 294502.

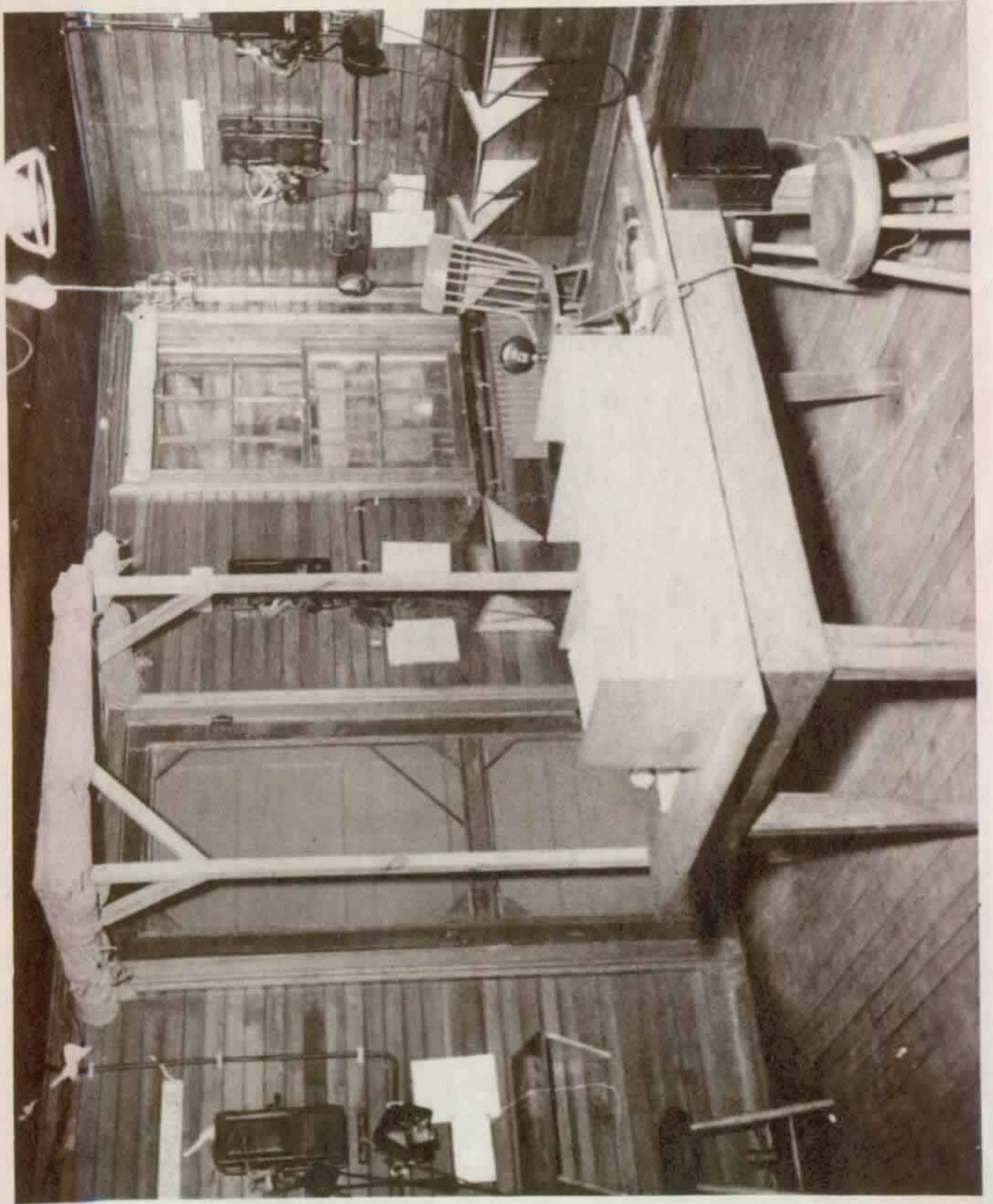


Plate VII

Underground Emergency Message Center, Fort Moultrie bombproof, 1941-44. In March 1944 this equipment and the furnishings were relocated in Message Center Room of the new HECF-HDCP. Courtesy U.S. Army, SC 294505.

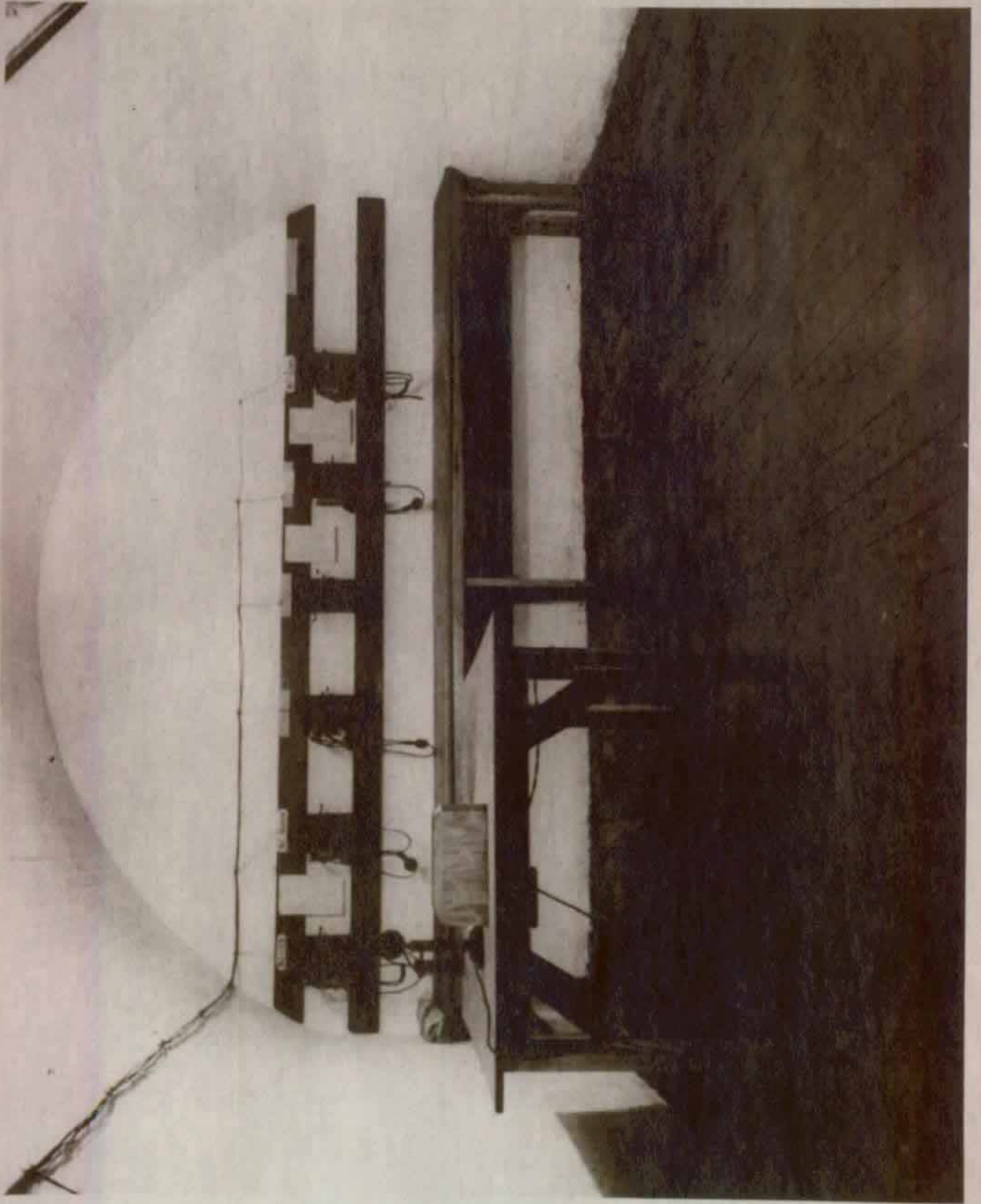


Plate VIII

The Communications Room of the Fort Moultrie Harbor Defense Command Post, 1941-44. In March 1944 this equipment was relocated in the Duty Officer's and Operations Room of the HECF-HDCP. Courtesy U.S. Army, SC 294626.

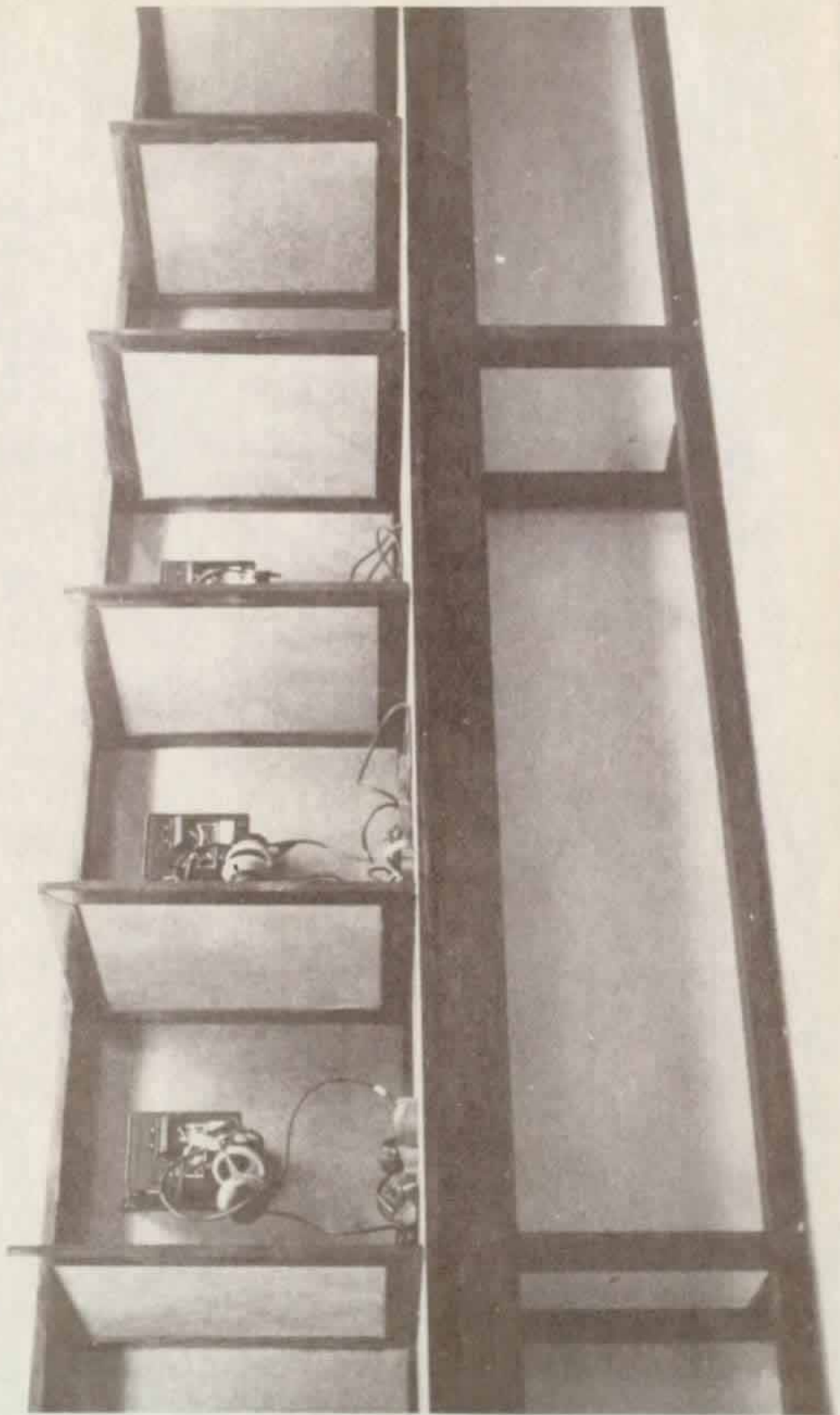


Plate IX

The Harbor Defense Command Post, Harbor Defenses of Charleston, 1941-44. In March 1944 this equipment and the furnishings were moved and relocated in the Duty Officers' and Operations Room at the new HECF-HDCP. Courtesy U.S. Army, SC 294501.

7

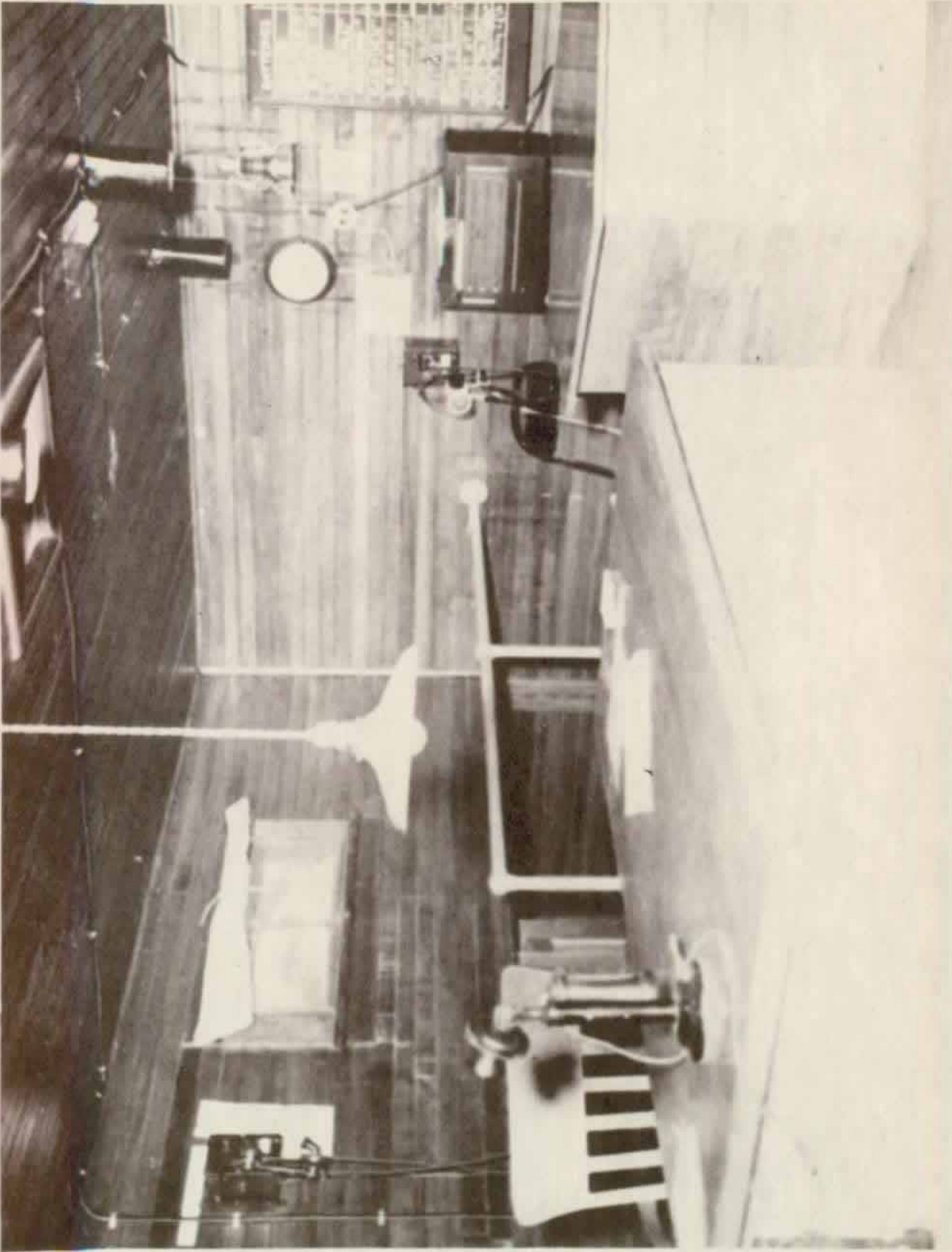


Plate X

Emergency Harbor Defense Command Post, in the Fort Moultrie principal magazine, showing "Major Anderson's quarters," c. 1943. Upon completion and occupation of the splinterproof and gasproof HECF-HDCP, this command post was abandoned and the furnishings and equipment moved into the Duty Officers' and Operations Room. Courtesy U.S. Army, SC 294504.

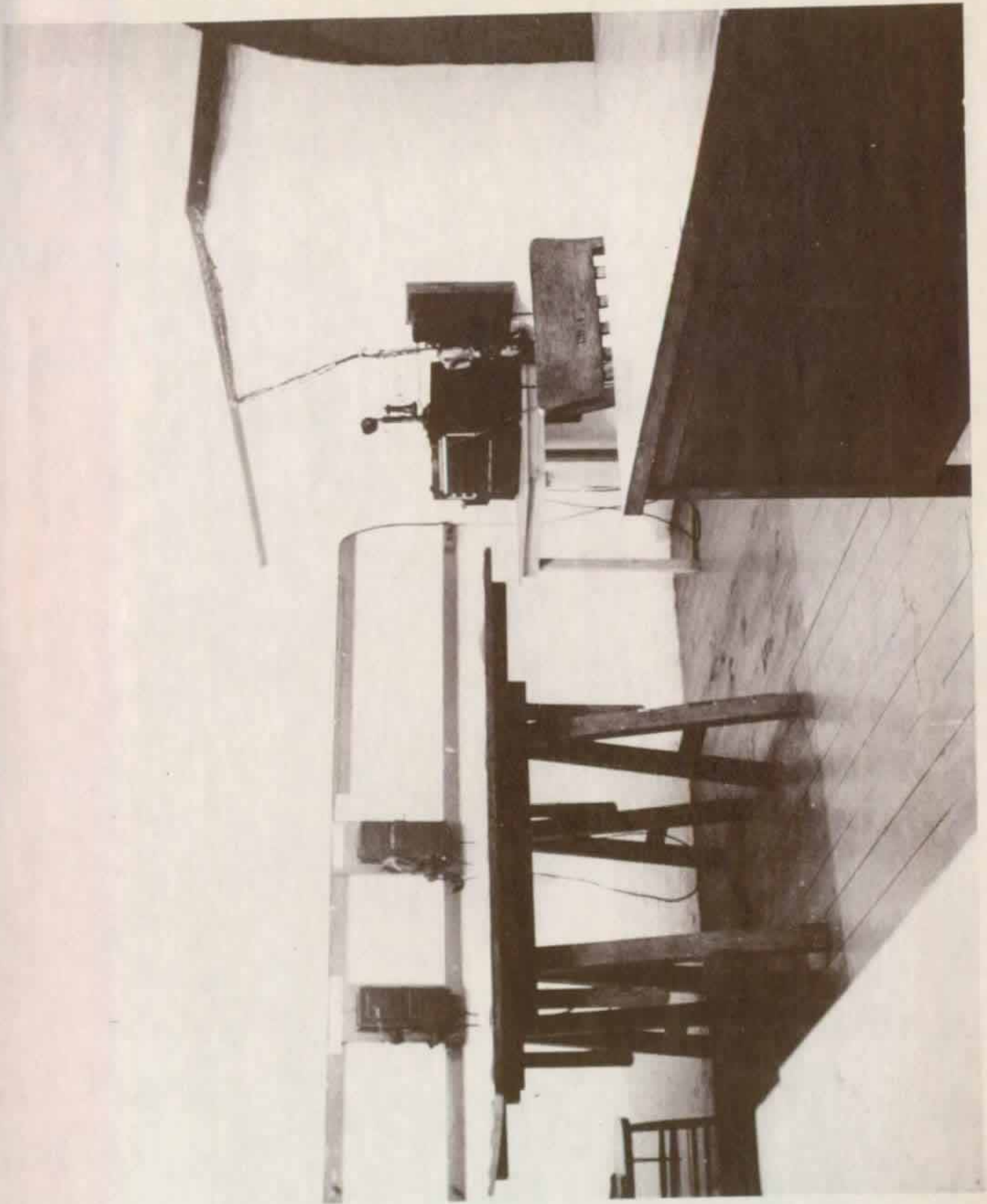


Plate XI

Observation Post in the temporary HECF-HDCP at Fort Moultrie, c. 1942. When relocated to the splinterproof and gasproof structure in March 1944, the Azimuth M1910 A1 was positioned on the concrete block in the southeast corner of the Observation Post. Courtesy U.S. Army, SC 294503.



Plate XII

"Joint Army and Navy Radio Receiving and Transmitting Station" in Fort Moultrie temporary HECF-HDCP, c. 1942. By March 1944 this equipment had been relocated in the radio cabinet, near the north wall, of the Radio Room of the splinterproof and gasproof HECF-HDCP. Courtesy U.S. Army, SC 294575.



Plate XIII

Emergency power plant underground at Fort Moultrie, c. 1942. After construction of the splinterproof and gasproof HECF-HDCP this generator was moved into the Power Room. After the Park Service took over the structure in 1970, this generator or a similar one was transferred to Fort Sumter. Courtesy of U.S. Army, SC 194587.



Plate XIV

Underground Harbor Defense radio receiver and transmitter station. Fort Moultrie, c. 1942. In March 1944 this equipment was moved into the Radio Room of the new HECF-HDCP. Courtesy U.S. Army, SC 294572.



Plate XV

Battery Dix Plotting Room, Fort Wadsworth, 1932. A plotting board such as depicted was in the Observation Post of the Fort Moultrie HECF-HDCP. Courtesy U.S. Army, SC 295035.



Plate XVI

"Suspicious vessels are tracked by observation instruments and their course plotted, 'just in case.' " This photograph of an observation post in an unidentified HECF-HDCP appeared in the July-August 1942 issue of the *Coast Artillery Journal*, p. 41.

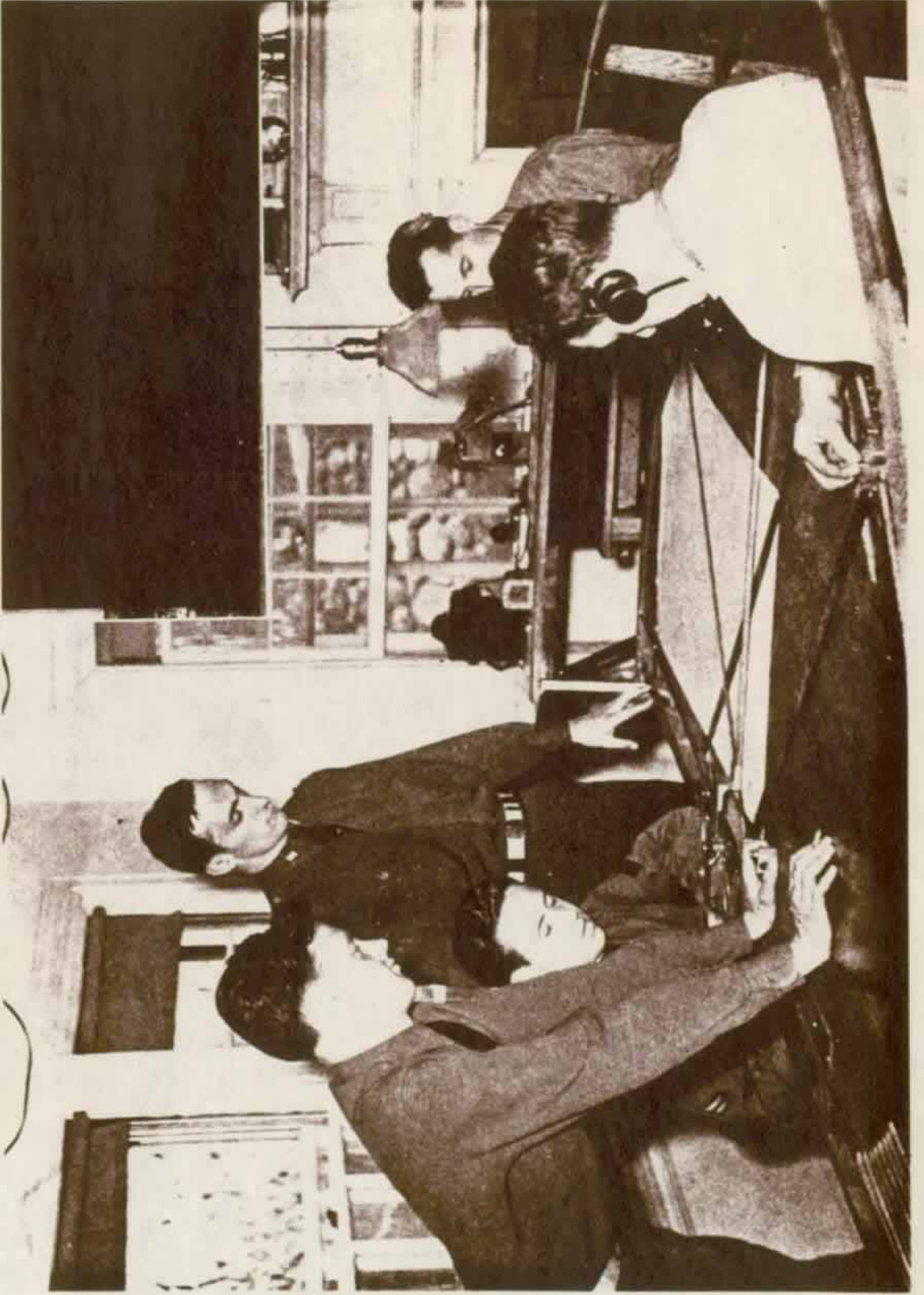


Plate XVII

Construction of combined HECF-HDCP at Fort Moultrie, July 14, 1943. Courtesy U.S. Army, SC 294562.



Plate XVIII

The new HECF-HDCP at Fort Moultrie, winter of 1943-44. Note camouflage painting, C.W.S. Intake Pipes, stairway to roof of signal tower, and absence of metal foul weather covering. Courtesy U.S. Army, SC 294506.



Department of the Interior / National Park Service NPS 773