COMINCH FILE

UNITED STATES FLEET
HEADQUARTERS OF THE COMMANDER IN CHIEF
NAVY DEPARTMENT
WASHINGTON 25, D. C.

15 September 1944

ACTR 713 Copy 8

MEMORANDUM

From: F-48
To: [redacted] Mail Room.

Subject: Distribution of Naval Commander Western Task Force (CTF 122) Serial 000201 of 25 July 1944, and 1st and 2nd Ends. thereto. (Subject: Report of NORMANDY INVASION.)

1. Please have subject report distributed as follows:

ComInCh F-105; F-48(3); F-30; F-46(2); F-4142	8
Vice CNO Op-02; Op-03; Op-16; Op-16E; Op-20; Op-20G; Op-23; Op-12(Annex C only); Op-30; Op-28(Hydrographer)(Annex B2 only); Op-33; Op-34-E(weather)(Page 8 and Annex B3 only)	12
Op-16-1-V (2)	2
BuAer	1
BuMed (Annex F only)	1
BuOrd	1
BuShips	1
Naval War College	1
General Board	1
Secretary of the Navy	1
Under Secretary of the Navy	1
Asst. Secretary of the Navy	1
Asst. Secretary of the Navy for Air	1
Naval Aide to the President	1
CinCPac	1
CinCLant	1
ComThirdFleet	1
ComFifthFleet	1
ComSeventhFleet	1
ComEighthFleet	1
ComNorPac	1
ComThirdPhib	1
ComFifthPhib-Administrative Command	1
ComSeventhPhib	1
ComEighthPhib	1

6-18-2507/44

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
1944	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Operation Normandy invasion	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **United States Fleet Navy Department**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
JFSC - WW II Declassified Records.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**UU**	**178**	

COMINCH FILE

UNITED STATES FLEET
HEADQUARTERS OF THE COMMANDER IN CHIEF
NAVY DEPARTMENT
WASHINGTON 25, D. C.

~~SECRET~~

PhibTraPac	1
PhibTraLant (5)	5
ComGen, FifthPhibCorps	1
ComAirPac	1
ComAirLant	1
ComAirSeventhFleet	1
COTCPac	1
COTCLant	1
ComdtMarCorps	1
~~Chief of Staff~~, U. S. Army (3)	3
Commanding General, U. S. Army Air Forces	1
Comdt Army and Navy Staff College	1
Comdt Command & General Staff School, Fort Leavenworth, Kansas	1
Comdt Marine Corps Schools, Marine Barracks, Quantico, Va. (3)	3
War Plans Officer, BuDocks (Annex C only)	1

G. C. GILL.

BURN WHEN NO LONGER REQUIRED

39161
RECORD NO. [redacted]

(2)

[redacted]

SECOND ENDORSEMENT to
NCWTF's Top Secret ltr.
000201 of 26 July 1944
to Cominch and CNO.

No. X/0481. 2nd September, 1944.

From: Allied Naval Commander-in-Chief, Expeditionary Force.

To: Commander in Chief, United States Fleet.

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF 122)

Forwarded. Comments on Naval Commander Western Task Force report will be forwarded in Allied Naval Commander-in-Chief Expeditionary Force report on Operation [redacted] a copy of which will be forwarded you in due course. Northern France

for ADMIRAL.

1944 SEP 9 16 05

③

175

OM-9168
3 Encl

Please refer to file: SERIAL 001824

UNITED STATES FLEET
UNITED STATES NAVAL FORCES IN EUROPE
20 GROSVENOR SQUARE
LONDON, W.1

~~TOP SECRET~~
SECRET

ALLIED NAVAL COMMANDER EXPEDITIONARY FORCE
3 copies
AUG 1944
E O
0481

AUG 16 1944

SC-3566.

CLASSIFICATION THIS CORRESPONDENCE CHANGED TO ... SECRET
AUTHORITY ... F.T.T.
DATE ... 9-15-44

FIRST ENDORSEMENT to
NCXTF's Top Secret ltr.
000201 of 26 July 1944
to Cominch and CNO.

From: Commander, U.S. Naval Forces in Europe.
To : Commander in Chief, United States Fleet,
and Chief of Naval Operations.
Supreme Commander, Allied Expeditionary
Force.

Via : Allied Naval Commander, Expeditionary Force.

Subject: Operation [redacted] - Report of Naval
Commander Western Task Force (CTF 122)

9 32c

1. Forwarded.

2. The task assigned the Western Naval Task Force (Task Force 122) was carried out efficiently as viewed from these headquarters and as reported from the various operational headquarters concerned. Operational comment is being left to ANCXF and the Supreme Commander.

3. Referring to paragraph 3, the command organization was not particularly complex. It paralleled generally that under which the First U.S. Army operated, wherein the Commanding General First Army was operationally under Commander 21 Army Group, but was supported by the Deputy Theater Commander, ETOUSA. In both cases advantage was taken of the specialized training, skill and local knowledge of the U.S. Army and U.S. Navy logistic organizations which had been in this theater a considerable period of time before the operational forces arrived.

4. Referring to paragraph 17, it would appear that the only alternative to the present system is to delegate authority to the various sub-commanders to make awards on the spot. However, it is questionable whether this would greatly improve matters inasmuch as the operational recommendations for awards were not sifted and prepared by the operational command until approximately D plus 45, when they reached ComNavEu. About 1000 recommendations were received from D plus 45 to D plus 60. Special arrangements existed from D day onward to insure and effect prompt awards of the Purple Heart.

(4)

CC: Cominch direct

WILLIAM GLASSFORD,
Acting

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

A4-3

000201

Navy 803
FPO , N.Y.
25 July 1944

SECRET

SC 3550

From: Naval Commander Western Task Force, (CTF122).
To : Commander-in-Chief, United States Fleet, and
Chief of Naval Operations.
Supreme Commander, Allied Expeditionary Force.
Via : Commander, U.S. Naval Forces in Europe.
Subj: Operation Normandy Invasion - Report of Naval Commander
Western Task Force (CTF122).

Ref : As listed on page 19.

Encl: As listed on page 19.

1. This report covers the period from November 9, 1943, to July 3, 1944.

2. Amphibious Assaults.

It is my opinion that there has now been developed a technique of amphibious assault, which, when properly implemented, can be counted upon to ensure a successful landing. Experience of joint British-American forces in the Mediterranean and in this theater, coupled to those acquired in the Pacific and Southwest Pacific theaters, prove by their unbroken series of successes that our system is correct. It is not maintained that in each instance the method of application must necessarily conform to the rules, and that is the particular point to be stressed. The fact is that when we have sufficient power, and when that power is properly applied, the Navy, assisted by the Air, can force a landing for the Army. Given the correct choice of objectives, particularly in terms of the suitability of the selected beaches from the military and naval points of view, the application of power, as we now understand it, will produce the desired results. We must assemble sufficient forces and move them rapidly to the objective to create this power, which so often has overwhelmed the enemy. The apparent ease with which some amphibious assaults have succeeded is merely a measure of the fact that the power employed was in fact overwhelming, and was correctly applied.

It is not suggested that a formula has been derived which fits every case. On the contrary, each case is peculiar to itself, and in the choice of the weight to be

(5)

#1

File No.
CTF122 /A4-3

Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.

25 July 1944.

~~TOP SECRET~~ SECRET

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

- -

given the various components lies the field for exploiting the peculiar aspects of the specific situation. It appears that the United Nations are now generally in such strength as to make possible the assembly of forces of all services and arms to provide the necessary factor of safety. What value we give this factor of safety depends upon the political and military consequences attendant upon victory - or a reverse. When the issues are great, this safety factor must be more generous; on other occasions, the margin may be cut down. The date for making the assault is often governed by strategical considerations which dictate movement earlier than a conservative attitude toward assembling of forces might desire. Similarly, the speed with which an operation is launched supplies the other term in the power factor, i.e., that of time. If the mass be great and the speed of attack be high, the greatest power is developed. In spite of occasional misgivings as to the scope of enemy intelligence, it also appears that surprise, in greater or lesser degree, is invariably attained by amphibious operations. The initiative remains with the Assault Force, as does the choice of the locality and the date and hour of the attack. Despite increased mechanization, armies cannot shift their positions as rapidly as seaborne troops can move along a coastline. This is true of continental assaults and particularly so when there are a number of suitable landing beaches running along a hostile coastline. Surprise is assisted materially when our own forces enjoy superiority in the air sufficient to deny the enemy close observation of the amphibious movement.

Intelligence is vital and must be obtained. The scheme of assault depends largely upon an accurate diagnosis of the enemy's defense system. This information must be obtained by those responsible for intelligence, and one of the most important items in this connection is aerial photography. Without good aerial photographs it is very difficult to construct a plan or model of the defenses to be conquered. Even so, some undiscovered resistance points will exist.

It is not my view that our technique of amphibious assault should be allowed to become rigid or inflexible. The technique should be altered as experience dictates. In any

File No.
CTF122 /A4-3

Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.
25 July 1944.

~~TOP SECRET~~

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

---

particular landing, because of the complexity and many details of an amphibious assault, a carefully prearranged plan is essential, and to that extent, the assault becomes a "set piece". The plan should provide for the rapid exploitation of initial successes, but the personnel must be trained to expect conditions other than those planned for, in order that, when heavy resistance has slowed the initial assault and delayed its timing, the individual initiative of the subordinates and improvisation to meet the unexpected conditions will overcome the difficulties encountered.

Thus in the case of the OMAHA Beaches in this operation, the time schedule for the boat waves became, in effect, a sequence for landing rather than a schedule of times of landing. The presence to seaward of the line of departure of the various components of the Army's scheme of maneuver permits of intelligent alteration of the order of landing, provided those in charge recognize the situation and have the means to direct and enforce the proper changes. It is in times like these that the experience, the state of training, and the innate resourcefulness of American and British sailors and soldiers comes to the fore. For example, on Beach OMAHA, the assault by three RCT's found itself opposed by a full-scale German field division manning a defensive system highly organized, strongly built, and skillfully designed. The initial check on this beach was overcome because of the initiative displayed by gunfire support ships, the assistance of the air force, and the intrepidity of the infantry on the shoreline.

On the whole, then, it is considered that the High Commands in all theaters have now developed amphibious warfare to an extent which makes each such assault capable of close assessment of its prospects of success. As our experience has accumulated, we have learned in what strength to assemble forces and how to attack positions which earlier seemed impregnable. In achieving this progress, we are but confirming historical precedents.

File No.
CTF122/A4-3
Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

[redacted]

Navy 803
Care Fleet Post Office
New York, N. Y.
25 July 1944.

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

- -

3. Command Organization.

Task force ONE TWO TWO was established by directives from Commander-in-Chief, United States Fleet and Commander TWELFTH Fleet. All U.S. Naval Forces assigned to Operation [redacted] were placed in this force, and the Task Force Commander reported to the Supreme Commander, for duty under the Allied Naval Commander-in-Chief. For administration and logistical support the Task Force Commander operated under Commander U.S. Naval Forces in Europe, while on other matters he was authorized direct communication with Commander-in-Chief, United States Fleet.

Commander Task Force ONE TWO TWO was thus responsible to three higher authorities:

(a) for planning, training, and active operations, to the Allied Naval Commander, Expeditionary Force;

(b) for administration and logistics to Commander TWELFTH Fleet; and

(c) for operational matters of interest, to Commander-in-Chief, United States Fleet.

In addition, whenever forces were operating within the limits of a British "Home Command", those forces were under the operational control of the Commander-in-Chief of that Home Command.

The whole command organization will thus be seen to have been complex. Commander Task Force ONE TWO TWO has no comment as to what other organization might have been possible, but he desires to point out that the success of a command based on cooperation does not change the old rule that naval operations are most effective when controlled through a simple and direct chain of command.

For the Army, the equivalent of Commander Task Force ONE TWO TWO was the Commanding General, FIRST U.S. Army, Lieutenant General Omar N. Bradley, U.S.A.; and for the Army Air Force, the Commanding General, NINTH U.S.Army Air Force,

(8)

File No.
CTF122/A4-3
Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.
25 July 1944.

~~SECRET~~

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

- -

Lieutenant General Lewis H. Brereton. It is a great pleasure to record that throughout a prolonged association in planning, training, and fighting, the most cordial and effective cooperation was maintained with both of these commands. This success was obtained within the framework of the established U.S. procedure for command in an amphibious operation. It was greatly assisted by the early conclusion of a joint agreement by Commander Task Force ONE TWO TWO and the Commanding General, FIRST U.S. Army (CTF122 Secret Security Serial 0066 of February 25, 1944), which defined the zones of responsibility for Army and Navy authorities in the American Sector. Similar high standards of effective cooperation were maintained by all major subordinate units of the two services. In this respect it should be noted that the personal relationships of the senior commanders concerned at each level are of critical importance in defining the standard maintained by staff officers and junior commanders. A firm tradition of mutual trust and confidence now exists, but this record could easily be marred in special instances by the personal incompatibility of two commanders of different services. There is no effective guarantee of success - it takes one to command and two to cooperate; and the existence at a remotely high level of a supreme commander cannot ensure cooperation against the will of subordinates.

4. Planning.

It will be realized that planning for this operation had its start in the Summer of 1942 when the operation called [redacted] was conceived. Through various stages and for various reasons, Operation [redacted] finally evolved into the present Operation [redacted] Planning really commenced in late April 1943, when the current operation was originally analyzed for practicability and scale of forces required. While certain features of the original planning were altered considerably for the actual operation, the basic tactical plan was in a larger sense that employed in [redacted]

It seems to me this preliminary plan had two main influences:

(a) The planning continued for a period which was long enough to permit material

(9)

File No.
CTF122/A4-3

Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.

25 July 1944.

~~TOP SECRET~~ SECRET

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

---

and operational experiments to be carried out to test the practicability of the planners' ideas. These experiments covered material ones conducted in the various weapons and landing craft under a wide set of circumstances as well as exercises carried out by troop units and specialized parties organized for the accomplishment of new types of missions.

(b) Planners, who were faced with the new problems presented by the Channel Operation and who had only the comparatively easy successes of the Mediterranean or the disastrous casualties of Dieppe on which to base their estimates, were able to consider them in comparative leisure. During this planning period many original concepts were discarded and many of the final concepts of the plans were thus laid. This saved the final planning groups much of the weeding out of ideas they would otherwise have had to face.

Commander Task Force ONE TWO TWO as Senior U. S. Naval Commander was responsible for the translation to U.S. methods of the very extensive plans prepared by the Allied Naval Commander, Expeditionary Force. The planning done by the ANCXF was of a very high order, but at the same time this operation illustrated once more the great difference in planning methods and concepts of command between the Royal Navy and the U.S. Navy. British plans are issued in great detail from higher to lower echelons. American naval tradition tends to leave details of execution and planning to the officers who are actually charged with doing the job. An operation on the scale of this one, of course, demands a large measure of coordination at the highest level, but in fact very much of this can be reduced to a Standing Operating Procedure issued long before security permits the distribution of the Operation Order. What remains, can then be

(10)

File No.
CTF122 /A4-3

Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

001991

~~SECRET~~

Navy 803
Care Fleet Post Office
New York, N. Y.

25 July 1944.

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

- -

issued in very much shorter and less complicated form.

5. H-Hour.

It is believed that an H-Hour earlier in reference to the tidal conditions would have been preferable, particularly for OMAHA Beach. On both of the American beaches the conditions at H-Hour were satisfactory for landing from low water on, as regards the quality of the beach itself; but in the British Sector there were a couple of beaches with rocks and ledges offshore which made a landing prior to about half-tide undesirable.

The military authorities did not consider it desirable that the time for landing should vary more than an hour between the American and British sectors. This dictated an H-Hour for OMAHA and UTAH Beaches which it was estimated would allow about thirty to forty minutes of dry landing on the beach before the water reached the first row of obstacles.

One of the reasons against an H-Hour longer after daylight was that the amount of remaining daylight would not then permit, on D-Day, a second high water period available for unloading. It is not believed that this reason is of great importance and certainly not sufficient to alter the desirability of greater time for working on the beach obstacles.

While the Naval Commander, Western Task Force, cannot pass upon the importance of the Army requirement for not over one hour difference between H-Hour on the various beaches, it appears desirable to point out that for a landing conducted with a large tidal range and with considerable obstacles on the beach, it would be most desirable to have the H-Hour provide as much time as can be made available to work on the obstacles and to clear the beach before the small landing craft, such as LCTs and LCIs, come in to land.

It is still my opinion, first formulated in the Sicily Operation, that broad daylight is the time to land, where our own naval and air superiority is preponderant. In the Normandy Operation our greatest factors of strength were our naval guns and our air force. Each of these offensive com-

(11)

001991

File No. CTF122 /A4-3

Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

~~SECRET~~ SECRET

Navy 803
Care Fleet Post Office
New York, N. Y.
25 July 1944.

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

---

ponents is at its best in broad daylight, when precision in its use can best be obtained. In half-light, neither is fully effective; and for both a longer time-period in which to function in good visibility will increase materially the advantages to be gained.

When we are not in overwhelming strength on the sea and in the air, then landing in darkness is preferred.

6. Weather, Postponement, and Timing of H-Hour.

The twenty-four hour postponement from June 5th to June 6th presented difficulties in reassembly and organization of convoys, which were overcome only by the most energetic and skillful management by Assault Force Commanders and their subordinates. The decision to go ahead on June 6th required very great courage on the part of the Supreme Commander, and appears to this Command to have been entirely sound. When troops have been loaded and briefed, and when all of the inter-locking services have set their time-tables to a given date, postponement, except in case of extremely bad weather, is not likely to produce benefits that outweigh its disadvantages.

It is none the less true that the weather on D-Day was considerably worse than had been expected during the planning and training stages of the operation. Both air support and the handling of small craft in the assault were therefore thrown somewhat off-balance, and it cannot be denied that the landing on the heavily opposed OMAHA Beaches was thereby considerably handicapped.

It is therefore recommended that in future operations where the scale of the landing and the number of closely inter-locking factors combine, as in this one, to make postponement very unsatisfactory, it be assumed during the planning and training periods that optimum weather conditions cannot necessarily be expected.

7. Minesweeping.

(12) It can be said without fear of contradiction that minesweeping was the keystone of the arch in this operation.

File No.
CTF122/A4-3
Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.

25 July 1944.

~~SECRET~~

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

- -

All of the waters were suitable for mining, and minesweeping plans of unprecedented complexity were required. The performance of minesweepers can only be described as magnificent. The passage of the Western Task Force to the assault area, and of the assault waves and supporting ships up to the beaches, without loss from mines, is the best testimonial to the effectiveness of their work. An equally high standard was maintained in the unremitting daily labor of sweeping the assault area during the build-up phase. It was not until the appearance of an entirely new type of mine that serious anxiety was felt as to waters pronounced "clear" by minesweeping officers. Losses from mines were very small.

8. Intelligence and Briefing.

The Intelligence work of all echelons was excellent. Complete and accurate information was obtained and was disseminated in clear and practical form. The forces in the assault had a confident knowledge of the topographical conditions off the beaches, the nature and appearance of the shore-line, and the status of enemy defenses. Intelligence information was not secured concerning the presence of the 352nd German Field Division in the OMAHA Area, and it is believed that this division arrived only a short time before the landing.

Special pains were taken in the assault forces to ensure a thorough briefing of all personnel. As a result, junior officers and men had a clear understanding of the terrain, the enemy defenses, and our plan of assault. The time and effort devoted to intelligence and to briefing paid big dividends.

9. Air Operations.

A uniquely high standard of air operations was achieved and maintained throughout this operation. Coordination between surface forces and the air force was excellent. Air cover was flawless. The only enemy air action which affected naval forces was a series of small-scale night raids of the type which can never be entirely prevented. Damage caused by these raids was very light, being limited almost entirely to

(13)

File No.
CTF122 /A4-3

Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.
25 July 1944.

~~SECRET~~ SECRET

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

- -

losses by aerial mining. Radio jamming of glider bombs was apparently effective.

A low ceiling on D-Day prevented heavy bombers from laying down a pre-H-Hour bombardment on OMAHA Beach. If this could have been done, the very difficult assault on that beach might have been aided. Results on both beaches indicate that dive bombing is more effective than horizontal bombing against batteries and small point targets.

Air spot was provided by planes operating from RNAS, Lee-on-Solent, and manned by spotters drawn from the RAF, Fleet Air Arm, U.S. Army Air, and the spotters of Cruiser Division SEVEN and Battleship Division FIVE. Out of two hundred twenty-nine (229) shoots conducted with air spotting, 79% produced neutralization or destructive effect. Only 42% of the spotting missions flown, however, actually spotted naval gunfire. Reasons for failure were breakdowns in communications, engine failures, inability to locate targets, weather, flak, enemy activity or ships not being in position to fire.

Many attempts and expedients were resorted to, in order to secure the kind of air spot our Navy employs. For various reasons success did not crown these efforts, and the ultimate solution was the compromise outlined above.

Spotting of naval gunfire against shore targets requires a two-seater plane of relatively high performance, and a period of training long enough to ensure mutual understanding between ships and spotting aircraft. In view of the late arrival of combatant ships and the specialized problems faced by the Air Force, the results obtained were gratifying, but we could do much better.

A particularly satisfactory aspect of this operation was the continuous and accurate information of the air situation which was given to naval forces by dispatches from Headquarters, NINTH Air Force. Such information is indispensable in the handling of forces afloat and in earlier operations it has been conspicuous mainly by its absence.

(14)

File No.
CTF122/A4-3

Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.

25 July 1944.

~~SECRET~~

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

- -

Great anxiety was felt by naval forces at the decision to route troop-carrying planes and gliders directly over the assault area during the night before H-Hour. As it turned out, careful briefing and good discipline prevented any naval anti-aircraft gunfire upon these planes. The same restraint was observed in later occasions.

In general, as long as ships and craft in the area were limited mainly to those directly controlled as members of the initial assault forces, anti-aircraft gunfire discipline was satisfactory. Later, however, when the initial organization had given place to the come-and-go of the build-up, the discipline of merchant vessels and small craft deteriorated and it became necessary to issue very stringent orders restricting anti-aircraft fire. A few friendly fighter planes were shot down and an enormous quantity of anti-aircraft ammunition was pointlessly expended in blind fire. It again appears that, with the exception of combatant ships and naval transports, the anti-aircraft discipline of individual vessels is inadequate. A simple and rigid set of anti-aircraft rules is the only certain method of controlling such vessels. In this operation the Allied Naval Commander felt it necessary to prohibit all fire by merchant vessels at night, and it is certain that rules which are hedged by "if's" and "but's" are not effective.

10. Naval Gunfire.

The performance of battleships, cruisers, and destroyers in support of the landing was magnificent. The detailed plans made by Assault Force Commanders and the commanders of the bombarding forces were well designed and effective. Both in the pre-H-Hour bombardment and in the close support of troops fighting inland, naval guns lived up to our highest expectations. The work of gunfire support craft (LCG, etc.) before H-Hour was also helpful and in many cases captains of these craft acting on their own initiative provided extremely valuable assistance after the landing, especially in the first bitter struggle to get across the OMAHA Beaches.

There is still, however, a dead space between

(15)

File No.
CTF122/A4-3
Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.

25 July 1944.

[redacted] SECRET

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

---

the pre-H-Hour bombardment and the time when liaison with the ground forces ashore is sufficiently effective to permit observed fire upon enemy targets with due regard for our own troops. Shore Fire Control Parties, when they are pinned to the beachline or have become casualties, cannot assist destroyers offshore in the first few hectic hours; and, when the enemy is well concealed and the position of our troops is not clear to him, a naval officer offshore is in no position to order heavy fire. It has been suggested that Army officers familiar with the tactical plan and qualified to observe and interpret troop movements on the beachline, should be attached to destroyers and other ships which are in immediate support. Subject to the views of the Army, this Command concurs in that suggestion.

In any case, it still seems that our forces are too cautious in the employment of shell fire to support the infantry. There were cases where naval fire was withheld by Army request and in retrospect it is felt that the general attitude was over-cautious. No opportunity should be lost of impressing upon responsible Army officers the dependability and accuracy of naval fire. There were instances in this particular of reports from the beach that our own ships were shelling our own troops on the beach. All of these reports were completely inaccurate, and they had the very unfortunate effect of limiting subsequent fire by captains who no longer trusted their own excellent judgment.

11. The Storm - June 19th - June 21st.

On June 19th a Northeast storm developed and high winds continued for three days, developing waves of 9' to 12' on the beaches. Unloading was stopped and the wreckage of the ill-fated floating bombardons and many smaller landing craft drifted on to the beach. In the main, the [redacted] installations were wrecked and the [redacted] were very badly weakened. There was, in effect, no small craft refuge, and on June 22nd when the winds died and the work of salvage and unloading began, the situation looked grim. By the herculean efforts of all concerned, unloading was quickly resumed and maintained at a higher rate than before the storm. The beaches were cleared

(16)

File No.
CTF122/A4-3
Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

[redacted]

Navy 803
Care Fleet Post Office
New York, N. Y.

25 July 1944.

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

- -

of wreckage. The main [redacted] project was discarded - using the remains to such advantage as conditions permitted.

The speed and efficiency with which this recovery was made were remarkable and in succeeding weeks it was clearly demonstrated that with the present technique, open beaches can be used in summer weather to handle the tonnage desired by the Army.

12. Communications.

Communications in general were surprisingly good throughout the Assault Phases. During the Buildup, a very heavy volume of administrative traffic on some circuits caused delay in the delivery of important messages, apparently because of the assignment of unnecessarily high precedence to unimportant material and wrong choice of codes.

There was a tremendous demand for circuits and the supply was insufficient to meet all requirements. The TBS was inadequate and too many authorities other than naval were allocated facilities.

Codes were too widely distributed, too generally read, and no privacy of communications existed.

13. Landing Craft Performance.

In general both the design and the material readiness of landing craft in this operation proved entirely satisfactory. It is therefore recommended that in general the present designs be considered as standard, and that craft for special purposes be derived from one or another of the basic designs - the LSD, the LST, the LCI(L), the LCT(5) or (6), the LCM(3), and the LCVP. Each of these types has proved itself. The LCC is not, in its present form, satisfactory - it has too much gear in too small a hull, and its function should be transferred to a seagoing vessel which can proceed from friendly ports to the assault area under its own power. Special recommendations as to modifications of existing types of landing

(17)

craft are contained in the reports of officers with direct experience in handling these types.

This operation developed several distinctly new major modifications of normal types of ships and craft, most of which functioned as planned. Thirty (30) LSTs - fifteen (15) British and fifteen (15) U.S. - were fitted with rails and other minor adaptions to enable them to carry rolling stock. Three (3) British LSTs were converted as Fighter Direction Tenders to provide fighter control in the assault area during the period before suitable control centers were established ashore. Two special types of ramps were developed - one designed and installed in the U.K., the other designed by BuShips and installed during construction - to facilitate the launching of amphibious Sherman tanks from LCT(6)s. A British device called the "Mulock Ramp" was installed on all LCTs in the Western Naval Task Force to decrease the angle between the craft ramp and the beach to facilitate the unloading of vehicles. Certain LCT(5)s were fitted with elevated platforms so that Sherman tanks being carried therein could fire as they approached the beach. These and other devices are more fully described in the body of this report. Their development and successful use after a limited period of experimentation and training is a source of satisfaction.

14. Naval Organization in the Build-Up.

Although the immediate build-up on OMAHA Beach was delayed as a result of opposition and the consequent derangement of unloading schedules, the daily unloading of tonnage for both beaches taken together reached planned figures by D + 5. Owing to the short sea voyage from England, convoy sailing telegrams could not arrive very much in advance of the convoys themselves. After the arrival of convoys, taking of inventory and marshalling and directing individual ships, imposed the utmost strain upon existing facilities. PT and Coast Guard Rescue Boats were diverted from their primary duties and assigned to augment the PCs and SCs in such duty. The Army's insistence on priorities further aggravated this situation. Some of the Army devices for effecting priority unloading, such as "Green Light Ships" and "Red Ball Cargo" were not known to Navy shore authorities until

(18)

File No.
CTF122/A4-3

Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.
25 July 1944.

~~TOP SECRET~~

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

---

the operation was well underway.

All of the difficulties encountered were solved to the mutual satisfaction of both the Army and the Navy prior to the withdrawal of Naval Commander Western Task Force from the assault area.

The prolonged build-up period was a new feature in this operation. For weeks after the initial assault a continuously increasing volume of vehicles and stores had to be landed across the beaches. Not enough small boats and control vessels were available for this purpose and the craft which were pressed into service had not been properly trained or briefed for this type of work. In view of the critical importance of the assault itself, the decision to concentrate all available craft on training and participation in this phase seems wise, but in future, allocations of craft and training of personnel should allow for an adequate overhead off the beaches. Control Vessels, like the LCH, the PC, and the SC, are invaluable; but there must be enough of them and they must be equipped with radio and conspicuous visual markings. There must be an adequate supply of LCVPs or similar craft for the movement of officers and men concerned with management; and, if possible, early provision should be made for organized and rapid small boat communications between the beach and various offshore commands.

15. Area Screen.

The Area Screen was devised against E-boats and matched the plan for the Eastern Task Force Area. It was designed to furnish protection against surface and sub-surface attack from seaward, and it was so skillfully handled that at no time was there any penetration by enemy naval forces into waters off the U.S. beaches. The screen was composed of destroyers in the main, with PT boats and other smaller types in certain stations. After a few attempted E-boat penetrations, shortly after D-Day, which were firmly repulsed, the Germans left the screen severely alone. It was a good screen well directed.

(19)

File No.
CTF122/A4-3
Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.

25 July 1944.

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

16. Training.

Training for this operation was reasonably complete and in general very satisfactory. Training activities were ably coordinated by Commander ELEVENTH Amphibious Force, and each of the Assault Forces had two full-scale rehearsals, the second in each case being as close an approximation to the operation as possible. Difficulties of training occurred, however, in several isolated cases for reasons beyond the control of this Force.

(a) The training of Gunfire Support Craft was heavily handicapped by the slow delivery and the generally unsatisfactory operational condition of these craft.

(b) The training of some of the assigned combatant ships was limited by their late arrival - this particularly shortened their opportunity to become familiar with the Army Staffs of forces which they were to support in the assault.

(c) The long and slow negotiations which preceded the establishment of an agreed method of aircraft spotting resulted in an insufficient degree of coordination and effectiveness between ships and spotters during the early days of the assault. Air Spot was good but with an early and firm commitment on the very moderate number of planes and pilots required, it would have been much improved.

(d) The late development of the enemy's policy of setting up obstacles on the beaches found us not fully prepared for counter-measures on the scale

required; and it cannot be said that either the state of training or the tactical employment of demolition units was wholly satisfactory. This problem is one which must in the future be treated as a matter of urgency until its handling is adequately solved and incorporated into amphibious doctrine. On a well-defended beach, the skillful use of obstacles, especially to seaward of the low water mark, would, in the opinion of Commander Task Force ONE TWO TWO, make assault landings as we now understand them very difficult. This is especially true where the enemy can rush large reserves to the threatened beaches - as he can in a continental assault.

17. Medals and Awards.

It is noteworthy that at a time (late June) when selected Army personnel had already been decorated for their gallantry or professional skill during the assault, recommendations for Naval awards were still laboriously passing up through channels to the authority qualified to approve them. And this occurred in spite of the fact that every effort was made to accelerate the normal procedures. Even greater delays have occurred in past operations; during the weeks before D-Day two awards were presented to officers of this staff for work in the Sicilian Campaign. It appears to be a stubborn fact that Naval staff organization is not competent to deal quickly with this most important aspect of morale and unit pride; and it is suggested that a study be made of Army practice in this regard with a view to developing an adequate system adapted to Naval use.

18. Conclusion.

The total number of U.S. Naval personnel in the Western Task Force was approximately 125,000. It is my opinion that the performance of all hands from flag officers to seamen

File No.
CTF122/A4-3
Serial: 000201

UNITED STATES FLEET
TASK FORCE ONE TWO TWO

Navy 803
Care Fleet Post Office
New York, N. Y.

25 July 1944.

~~SECRET~~ SECRET

Subject: Operation [redacted] - Report of Naval Commander Western Task Force (CTF122).

- -

was in the highest traditions of the naval service; to command so fine a force in so large an operation was a great privilege.

Equally, the performance of British and other Allied vessels in the Western Task Force fulfilled my highest expectations, and the close association in combat with these fine sailors of other nations is a source of great satisfaction.

Finally, the skillful coordination of this vast operation by the Supreme Commander, General Eisenhower, and the high professional skill and sympathetic leadership of the Allied Naval Commander, Admiral Ramsay, will be remembered by all who served under them in the Western Naval Task Force.

A.G.KIRK.

Copies to:
No. 1 - Cominch via ComNavEu.
No. 2 - ComNavEu.
No. 3 - ANCXF
No. 4 - Cominch direct.
No. 5 - R.Adm.Kirk.
No. 6 - CTF122 files.
No. 7 - CTF122 files.

File No.
CTF122/A4-3

~~TOP SECRET~~

LIST OF REFERENCES AND ENCLOSURES

REFERENCES

(a) NCWTF OpPlan 2-44 of 21 April 1944.
(b) Commander Assault Force "O" Serial 00807 of 9 July 1944.
(c) Commander Assault Force "U" Serial 00198 of 26 June 1944.
(d) Commander Task Force 129 (CCD7) Serial 0034 of 1 July 1944, and Commander Cruiser Division SEVEN Serial 0066 of 6 July, 1944.
(e) Commander Force "B" Serial 00299 of 22 June, 1944.
(f) Commander Task Group 122.4 (CDS18) Serial 0067, Action Report of 6 June to 4 July 1944.

ENCLOSURES

COMMAND RELATIONSHIP AND PLANNING

I. COMMAND RELATIONSHIPS.

In November 1943, Task Force 122 was set up, within the framework of the TWELFTH Fleet, for the purpose of planning, training for, and participating in the assault phase of Operation [redacted] Normandy Invasion

It was specifically directed by the Commander in Chief, U.S. Fleet that Commander Task Force 122 would:

(a) Cooperate with appropriate U.S. Army Task Force Commanders during the training and preparatory phases to the end of adequately preparing the Joint Task Force for their part in the planned operations, and that

(b) For the embarkation and during the joint operations of the U.S. Forces and the command of the U.S. Army and Navy forces would be in accordance with the principal of unity of command. The shift of command from the Naval Task Force Commander to the Army Commander was to be arranged by those officers in accordance with the normal U.S. procedure.

Commander Task Force 122 was authorized to communicate direct with the Commander in Chief, U.S. Fleet and Chief of Naval Operations on all operational matters.

On November 15, 1943 CTF 122 reported for duty to the Chief of Staff to the Supreme Allied Commander and on January 18, 1944 to the Supreme Allied Commander, General Dwight D. Eisenhower, U.S. Army.

A joint agreement was arranged between the Commanding General, First U.S. Army and Commander Task Force 122 to cover Amphibious Operations.

II. PLANNING.

At the time Task Force 122 was established, preparations of the Outline Plans for [redacted] and [redacted], as then envisaged, was about complete. Admiral Sir Bertram H. Ramsey, prospective Allied Naval Commander in Chief, Expeditionary Force and Air Chief Marshall Sir Tafford L. Leigh-Mallory, prospective Commander in Chief, Allied Expeditionary Air Force, were acting respectively as principal naval and air advisers to COSSAC. General Montgomery reported late in December 1943

to complete the Joint Commanders in Chief Command echelon.

The original [redacted] concept of a three-division assault was then expanded to the five-division assault which was later actually conducted. A Joint Commander in Chiefs Outline Plan (ground-naval-air) was then prepared, with representatives of Commander Task Force ONE TWO TWO assisting as desired by the Allied Naval Commander in Chief, Expeditionary Force.

When the Allied Naval Commander in Chief, Expeditionary Force, prepared the Naval Outline Plan, representatives of Task Force ONE TWO TWO collaborated by attendance at numerous committee meetings and by direct consultation between opposite numbers of the American and British Naval Staffs.

With the increase from three to five assault forces, the Allied Naval Commander in Chief provided for both Eastern and Western Area Commands; and a British Naval Officer, as a counterpart of Commander Task Force ONE TWO TWO, was appointed to the Eastern Task Force Command.

There exist two fundamental differences between the U.S. and British methods of planning which had a considerable effect on the U.S. planning. These differences are:

(a) The British, in higher echelon prescribe details which in normal U.S. practices are left to responsible commanders in the lower echelons.

(b) The British do not use a standard order form.

When details beyond those required for coordination, are prescribed by higher echelons, the higher echelon is often then put in the position of relying on the lower echelon for information and data, which only the lower echelon can supply. This results in delay and a lack of firmness in planning, which in turn greatly complicates the planning of lower echelons employing the U.S. systems. In addition the freedom of action of the responsible lower commander is curtailed, as details of his plan become directives from higher authority.

The U.S. naval order form effectively fulfills its purpose. It is especially effective in showing the relationship between tasks and the means for their accomplishment, in the form of definite task forces. There is also an advantage in having a specific place to look for certain types of instruction. When the plans and orders of a higher echelon contain the details of execution by a lower echelon, the lower commander is forced to copy a great deal into his own plans and orders if there is

doubt about the extent of distribution of the plans and orders of the higher commander; or it may force a wide distribution of higher echelon plans and orders, with unnecessary dissemination of secret matters, not required by many or all of the lower echelons to whom distributed.

Collaboration in the planning of the higher echelons was limited to keeping ANCXF informed of the American viewpoint, and in obtaining advance information wherewith to draw up U.S. naval plans.

Probably the most serious handicap to preparation of firm naval plans was caused by delay in receipt of information as to the composition of the assigned forces. This was particularly so as regards the naval support in the Western Naval Task Force, which varied from almost an entirely British support to one with a preponderance of U.S. naval forces.

Delay in receiving information as to available lift was caused by the change over from a three division to a five division assault.

Planning relations with the FIRST U.S. Army were smooth and effective, helped no doubt by previous close association of the same two staffs in the Sicilian campaign. The fluctuation in lift to be made available kept loading plans in a state of fluctuation until a late date.

The volume of plans and orders received by commanders of small warships and landing craft, must have appalled those Commanding Officers who were allowed to open them some seven days before the landing was to take place. At that late date there were numerous corrections to be entered by these small commands.

INTELLIGENCE

I. ORGANIZATION.

GENERAL. Many intelligence and other agencies were directly concerned in producing and disseminating intelligence for the planning and conduct of this operation. In order to minimize duplication of effort, general directives for the provision of intellignece were laid down by the Chief of Staff Supreme Allied Commander (COSSAC) and subsequently by Supreme Headquarters Allied Expeditionary Force (SHAEF) fixing specific responsibility upon subordinate commands and agencies.

THEATER INTELLIGENCE SECTION, SUPREME HEADQUARTERS ALLIED EXPEDITIONARY FORCE. The primary agency responsible for the production of intelligence was the Theatre Intelligence Section (TIS), operating directly under COSSAC and later under SHAEF, which had been formed with the primary role of providing Supreme Allied Headquarters, British and U.S. Army groups, and ANCXF with detailed operational intelligence required for planning and executing the operation. Its responsibility for the production of intelligence to naval forces was limited to subjects of interest to both naval and military planners, e.g., submarine bases, E and R Boat bases, quay mining, underwater obstacles, terrain studies, and coastal defenses.

ALLIED NAVAL COMMANDER EXPEDITIONARY FORCE. ANCXF was responsible for the dissemination of naval intelligence to the naval forces. ANCXF ordered and received from TIS the type of intelligence for which it was responsible to the Navy. The Admiralty was the source of information concerning enemy sea mining hydrography, dispositions and descriptions of enemy ships and craft, and produced beach gradient mosaics, charts and chart-maps. Such material furnished by the Admiralty was distributed to subordinate commands by ANCXF.

COMMANDER U.S. Naval Forces, Europe.

(a) General. The services of Intelligence Section of Commander, U.S. Naval Forces, Europe were available to Naval Commander Western Task Force for the preparation and procurement of such special studies or reports as were required. One officer from that section was assigned to the staff of ANCXF for duty as Staff Officer, Intelligence (U.S.).

(b) Intelligence, Organization on the Far Shore. Intelligence in U.S. controlled occupied areas on the Far Shore was

the responsibility of COMNAVEU. Port Security Officers, counter intelligence officers, and one photographer (specialist) with portable microfilm equipment were assgned by COMNAVEU to the Combined Reconnaissance Party to move with advance units of the army into captured ports. Other French and German speaking officers, specially trained in prisoner of war interrogation and in document analysis were assigned to Headquarters First U.S. Army and to subordinate corps and divisional commands. These officers were to report later to Commander Captured Ports for duty in captured ports.

The Admiralty furnished a group known as the Number 30 Assault Unit consisting of about 130 specially trained officers and men, whose primary mission, assigned by ANCXF, was to capture important enemy documents and German Naval Headquarters and to forestall if possible the enemy attempts at demolition of important objectives. This unit was a part of the Combined Reconnaissance Party. No reports as yet has been received concerning its activities.

NAVAL COMMANDER WESTERN TASK FORCE INTELLIGENCE SECTION

(a) Responsibility. NCWTF was responsible for the provision of intelligence and graphic aids required by assault force and unit commanders under his command, during both the planning and assault periods. It was the function of the intelligence section not only to verify and transmit intelligence material provided by other sources, but also to furnish additional and more detailed intelligence in such form as was required by all U.S. Forces and ships of WNTF.

(b) Organization during the Planning Period. The intelligence section of NCWTF consisting of 15 officers and 26 men (13 of whom were aerological personnel), was organized as follows: Head of Section, four general intelligence and administrative officers, one aerological officer and one Chief Warrant Aerographer, one map reproduction officer, and seven photo interpreters. All personnel during the planning stage were located in London, where weekly conferences were held with intelligence officers from the staffs of the assault force commanders and of ANCXF.

(c) Organization during the Briefing and Operation Period. During the briefing and assault period, personnel of the intelligence section were assigned as follows:

(1) Head of Section, one photo interpreter, the aerological officer and his unit, and one general intelligence officer on board the flagship of NCWTF.

(2) One photo interpreter on the staff of Commander Support Force.

(3) One photo interpreter with the Photo Reconnaissance Unit of the First U.S. Army at Middle Wallop.

(4) One photo interpreter on board the First U.S. Army Headquarters Ship, who went ashore as early as practicable to take photgraphs of coastal defenses.

(5) The remainder of the section remained in London to maintain close liaison with sources of intelligence in the United Kingdom and to prepare material for possible subsequent amphibious operations.

INTELLIGENCE SECTIONS OF ASAULT FORCE COMMANDERS

(a) Organization. Intelligence sections of the assault force commanders were organized as follows:

(1) Force "O"; Head of Section, 5 general intelligence officers, one photo interpreter, and one map reproduction officer.

(2) Force "U"; Head of Section, 15 general intelligence officers, one photo interpreter, and one aerological officer and forecasting unit.

(b) Activities. The Assault Force intelligence sections disseminated intelligence furnished by higher echelons and provided such additional detailed intelligence material as was required by their forces. They also briefed personnel of all ships and craft taking part in the operation under their command.

II. SOURCES OF INFORMATION.

From sources available, information was obtained through the media of direct liaison, routine reports and requests for special reports. The principal sources, together with the general type of information supplied by each, were as follows:

(a) Allied Naval Commander, Expeditionary Force.

Direct liaison through the Staff Officer Intelligence (US) supplied information on enemy defenses, order of battle, hydrography, enemy capabilities, annotated charts and maps and the ANCXF Annexes described under "Intelligence Disseminated." Routine reports issued regularly gave up to date information of enemy defenses capabilities and order of battle.

(b) Theatre Intelligence Section (SHAEF).

Operating under the direction of SHAEF, the TIS made the studies, maintained the plots and prepared the material on which ANCXF reports were based. Through direct liaison TIS information became available immediately.

(c) Admiralty.

The Admiralty supplied information on hydrography, weather, enemy sea mining and dispositions of enemy craft. It supplied also beach gradient mosaics, charts and chart-maps. Liaison was through COMNAVEU and ANCXF.

(d) Commander U.S. Naval Forces, Europe.

Direct liaison employed for special studies and reports on such subjects as Enemy Capabilities in Chemical Warfare, Enemy Special Devices, Types of Enemy Ships and Craft.

(e) European Theatre of Operations (ETOUSA).

The Photo Procurement Division distributed to the Naval forces aerial photographs supplied by the 21st Army Group, RAF Medmenham and the First U.S. Army. These photographs were used for Photographic Interpretation Reports by NCWTF.

(f) First U.S. Army.

From its base at Middle Wallop, the 30th Reconnaissance Squadron, 1st U.S. Army flew routine and special sorties of the assault area. In the later stages of planning and during the operation, a photographic interpreter from NCWTF was stationed at Middle Wallop to obtain and check on first phase interpretation reports from the Provisional Photographic Detachment of the First U.S. Army. In addition, the First U.S. Army supplied Intelligence on enemy terrain, dispositions and capabilities through its G-2 Section.

ANNEX B1 - INTELLIGENCE

(g) Office of Naval Intelligence.

Supplied recognition material for ships and aircraft and summaries of Naval Intelligence gathered from many sources.

(h) ETOUSA ENGINEERS.

Worked with the Intelligence Section of NCWTF to correct and complete hydrographic data and beach gradients and contours.

III. PHOTOGRAPHIC INTERPRETATION.

Due to the massof current aerial photographs of the landing areas available throughout the planning period, aerial photographic interpretation was complete and detailed. Although the inadequacy of photo-processing equipment resulted in delays of from five to twenty-two days in the printing of photographs during the first part of the planning period, this condition was rectified about a month before the actual assault, by which time aerial coverage was received two to three days after being flown.

The following types of information of interest to amphibious planning were obtained almost wholly from a study of aerial photographs:

(1) Location of German Naval Units.
(2) Numbers and Location of German Aircraft.
(3) Beach gradients and profiles above LLW.
(4) Details of roads, exits and terrain features.
(5) Locations and details of emplacements of coast defense batteries. (Calibres and ranges were determined primarily from ground reports though physical limitations of traverse were found mainly from aerial photographs).
(6) Locations and types of beach obstacles (dimensions of individual obstacles were from ground reports).
(7) Numbers, sizes and locations of beach strongpoint defenses; locations of minefields and barbed wire.

Items 3, 5 and 6 of the above list were of the greatest importance to the WNTF. Beach Gradients were first determined by the British Admiralty in 1942 by the process of plotting the water lines of a number of aerial photographic sorties taken at different known heights of tide. In an area where the tidal range was as much as 25 feet, this method was particularly effective. In the early planning stages of the operation, this process was repeated by WNTF interpreters with newer sorties, and amplified by accurate locations of sand bars and runnels. During the later planning stages basic tidal data from which heights of water

lines on sorties was computed was revised. This change, together with a noticeable shift of sand bars on OMAHA which occurred after April storms, necessitated a restudy of the beach. Results of this final study, made first by U.S. Army Engineers and verified by Naval Interpreters, were incorporated into the operational graphic presentation of gradients.

Batteries located and reported by Medmenham and TIS interpreters were studied in extreme detail by this force. A complete historical file of each battery was maintained, and casemate construction and battery movements were carefully watched. German use of alternate positions for batteries and rapidly constructed prefabricated casemates for field positions and their ubiquitious employment of underground magazines and shelters made comparative study of numerous sorties imperative.

Beach obstacles were placed on the beaches late in the planning stage and then rapidly changing patters necessitated day-by-day plotting from the latest sorties available. Plans for their removal by Naval demolition parties made necessary detailed information on their construction and the mounting of anti-boat mines on them as well as accurate locations of obstacles rows in respect to tidal stages. The nature of the obstacles themselves was determined from excellent low altitude obliques flown by American P-38 aircraft, and their location was plotted from vertical photographs on beach profiles established by photo-interpretation. Predictions of the height of the obstacles above LLW were found to be accurate.

The study of German Naval vessels and aircraft was done as part of the routine interpretation of RAF Medmenham. Item 4, the study of natural features, was done in such detail as was required in their own commands by NCWTF and the U.S. Army Engineers. Beach strongpoints were studied and plotted by TIS and the First U.S. Army. Their principal interest to naval forces was their location and vulnerability to naval gunfire, as well as their capabilities against landing craft. They were studied in detail by this force.

The principal uses of photographic interpretation during the planning and operational stages of the invasion were as follows:

(1) All incoming intelligence from any source was

verified directly from photographs whenever possible.

(2) All information obtained from photographs which was of interest to the command or to subordinate forces was issued in report form. Forces "O" and "U" were also sent selected aerial photographic sorties for their own study.

(3) Maps used for preparation of shoreline sketches were corrected, and models kept up to date by study of current photographs.

(4) Photographic Material for use in the operational phase by ships and forces of NCWTF was prepared.

(5) During the operational stages interpreters were used aboard NCWTF flagship and with the Support Force, and in first phase work with the rear echelon. Forces "O" and "U" each had a naval photo-interpreter attached to their staffs, who maintained liaison with NCWTF interpretation unit during the planning stage and served aboard the assault force flagships during the assault.

The principal difficulties encountered in the production of aerial photo-intelligence by this force were the chronic lag in photo processing during the first part of the planning period, the lack of available photo laboratory facilities for special copy and enlarging work required by the photo interpreters.

Due to the proximity of the area chosen for amphibious assault to aircraft bases in England, the demands made on photo-reconnaissance and photo-interpretation were very great. In spite of the comparatively large amount of ground intelligence of the French coast available in the United Kingdom, and the difficulties discussed above the great majority of the information used by naval forces in both the planning and assault stages of the operation came directly from the study of aerial photographs. Such shore recommaissance as has been undertaken to date has verified this information as correct.

IV. INTELLIGENCE DISSEMINATED.

In the preparation of the intelligence material, emphasis was placed on graphic, rather than on written material.

During the planning phase the Assault Force Commanders and certain subordinate commands were supplied with basic charts

maps, plans, photographs and rubber models and were kept up to date by the frequent issue of reports, overlays, overprints and pictures covering enemy defenses; beach, weather and hydrographic data; enemy order of battle and information on enemy devices and capabilities. A constant plot of enemy defenses was kept on transparent material placed over maps and from these master copies photographic reproductions, and overprints were issued frequently to keep planners informed of the details of enemy defenses in the proposed assault areas

Intelligence material for the actual operation was gathered together in a single illustrated monograph which was widely distributed.

For operational use, forces were supplied with Shoreline Sketches, Photo Mosaics, and the Northern France [redacted] Monograph, together with detailed graphic and written intelligence on enemy defenses, enemy order of battle, weather and hydrographic data and enemy capabalities.

In connection with the preparation and dissemination of intelligence material, constant and direct liaison was maintained with Force Commanders, ANCXF and the First U.S. Army to assure the completeness and accuracy of all material issued. Dissemination included all Allied Units concerned with planning and operations.

Intelligence documents of particular value disseminated included the following:

(1) Northern France [redacted] MONOGRAPH. An attempt was made to include in one convenient colume, in graphic form as far as practicalbe, a compendium of the intelligence required by ships and craft. Subjects covered by this volume were: Weather, Sea and Surf; Tides, Currents and Astronomical Data, Terrain and Coast; Beaches; Enemy Order of Battle and Capabilities; Enemy defenses and Installations; Small Ports in the Assault Area; France under German Control, and a Folio of Sketches, charts and maps. The Monograph was distributed to forces, groups, ships and craft down to LCT's. Intelligence in the Monograph was kept up to date by the dissemination of supplementary intelligence to be inserted in the volume. This included corrections to material previously issued, and new intelligence based on photographic interpretations and revisions and additions to the plans for the operation.

(2) SHORELINE SKETCHES. Produced primarily to guide coxswains and navigators of landing craft to their assigned beaches, the Shoreline Sketch presented on one 17 x 22 sheet a chart-map of at least half of each of the two assault beaches, a panoramic drawing of the shoreline as seen from seaward, sunlight and moon light data, beach gradient graphs, inshore current data and tidal curves. They were overprinted with the different beach named and limits and were disseminated to the smallest landing craft. A limited number were overprinted with underwater obstacles and beach minefields immediately before the assault for special distribution to Navy and Army assault forces and demolition crews. The Shoreline Sketches were thoroughly covered in the intelligence briefing sessions and most landing craft personnel had four or five days to study them before the assault. Four of these sketches covered "OMAHA" and "UTAH" beaches.

(3) ANNOTATED SHORELINE SKETCHES AND MOSAICS. To disseminate complete intelligence on beach defenses, based on the latest possible photographic cover, a plot of defenses was kept on transparent acetate placed on a Shoreline sketch. This plot with the map beneath was reproduced photographically and bound together with gridded and annotated photographic mosaics of the beach areas to the same scale as the shoreline sketch. At D-7 these were distributed to Force Commanders.

(4) LANDING CRAFT PROFILES. Printed on transparent material to the same scale and proportion as the beach gradients on the Shoreline Sketch, these profiles were used with the sketches to estimate where each type of craft would touch down at any stage of tide on either beach. Copies were included in the [redacted] Monograph.

(5) PHOTOGRAPHIC INTERPRETATION REPORTS. A series of Photographic reports, based on latest possible cover and including intelligence on all phases of enemy defenses, frequently illustrated with photographs or sketches, was issued as frequently as interpretation of new cover was completed. Copies were sent to the Allied Naval Commander, Expeditionary Force; Commanding General, First U.S. Army, and Naval Force Commanders.

(6) BOMBARDMENT AND GUNFIRE PLAN. A graphic presentation on a single sheet of enemy heavy batteries in the assault area with their arcs of fire, priorities assigned for neutralization and the plan of attack by aerial

bombardment and naval gunfire. Copies were included in the [redacted] Monograph.

(7) INTER-SERVICE INFORMATION SERIES. Large books prepared by the Inter-Service Topographical Department of the Admiralty giving detailed information on topography, climate, roads, waterways, maps and pictures of enemy-held territory. Distributed to Force Commanders and large ships.

(8) TACTICAL TARGET DOSSIERS. Large books prepared by the Air Ministry and the U.S. Army Air Forces giving details and aerial photographs of objectives selected because of their importance to ground forces engaged in combined operations and presented to meet the operational requirements of supporting tactical air forces. Distributed to Air Spotters and Support Force ships.

(9) ANNOTATED PHOTOGRAPHIC MOSAICS. Two sets, in addition to those described under 3 above were ordered for NCWTF by the 21st Army Group. One, to a scale of 1/25,000, was a controlled, gridded and annotated series of 25 sheets covering the entire area of the operation. The other, to a scale of 1/12,500, was an ungridded and unannotated series of 18 sheets covering the area from St. Vaast to Port-en-Bessin to a depth of 12 miles inland. Each set was distributed to gunfire support ships and air spotters. Ground spotters and beach battalion commanders were also issued the 1/25,000 series.

(10) ANNEXES TO ANCXF OPERATION ORDER. This series comprised a group of booklets covering assault beach defense maps, tests and diagrams of all batteries in the English Channel area, texts and overlays of coast defenses, aerial photographs (annotated) of all batteries from Honfleur to west of Cherbourg, photographic shoreline silhouettes of the coast from Trouville to Cap de la Hague. These were distributed in selected groups down to LCT's, the distribution lists being guaged to the probable requirements of each group.

(11) RUBBER MODELS. Twenty (20) sets of 1/5000 rubber models, prepared by the Amphibious Training Command, NOB, Norfolk, Va. were distributed to Naval Force commanders and to the First U.S. Army. Their primary use was in connection with briefing.

ANNEX B1 - INTELLIGENCE

(12) VECTOGRAPHS. Vectographic photographs prepared by the Photgraphic Interpretation Laboratory, Anacostia for study of the assault areas in three dimensions were distributed to the Assault Force Commanders, primarily for use during briefing.

V. ENEMY FORCES

A. Enemy Naval Forces.

(a) Enemy Surface Craft Activity. Enemy naval activity in the Western Task Force area was confined to sporadic sorties off Barfleur at night by E-Boats 15 of which on D-day were based on Cherbourg, and by German tank landing craft type three based on Barfleur and St. Vaast. On these sorties mines were laid and, in one case at least, shipping was attacked. On the night of 8 - 9 June a force of three or more of these E-boats with possibly some tank landing craft from Barfleur or St. Vaast were taken under fire by destroyers of the screen and were forced to withdraw to the north. The extent of the damage inflicted was not determined, These boats had succeeded, however, in sinking two LST. By 11 June the number of E-Boats at Cherbourg had been reduced to five. Three tank landing craft at Port en Bessin did not succeed in leaving the harbor

(b) Submarine Activity. There were no reports of submarine activity in the Western Task Force area. One source reported that W-Boats were suspected, but there has been no evidence to confirm this report.

(c) German Naval Activity in the Vicinity of the Assault Area.

(1) Submarines. No enemy submarines were operating in the English Channel or its western approaches on D-day. On the night of 8 June three (3) were reported in the western approaches and by 11 June it was estimated that 4 to 6 were on patrol in the general area between the Cotentin Peninsula and St. Catherine's Point. No ships are known to have been attacked by submarines which probably because of air and surface patrol, confined their activities to reconnaissance.

(2) Surface Craft. E-boats, based at Le Havre and other French ports to the north, attempted sorties into the eastern part of the British Assault area. Of the 5 to 7 E-boats estimated to be based on Le Havre on D-day, only 3, however, remained by 11 June. An enemy force of 4 destroyers (3 Narviks and 1 Elbing) departed the Biscay area for Brest shortly after the Allied landing. On the night of 8-9 June this force was taken under attack by a British coastal force which succeeded in destroying one destroyer and left another aground and on fire at Ile de Bas.

B. Enemy Air Force Activities.

Enemy air activities was confined mostly to mine laying at night. There were a few light bombing attacks against shipping and the beaches. Most of the attacks occurred between midnight and 0400. A complete day by day report of enemy air activities is contained in the Air Annex.

C. Army.

On D-day, it is estimated that the enemy had a total of 59 divisions in the west grouped as follows: 10 Field Infantry Divisions, 26 Limited Employment Divisions, 10 Panzer Divisions, 2 Paratroop Divisions and 11 Training Divisions.

Actually opposing the 1st U.S. Army were the 352nd. Field Infantry Division, 243rd., 709th., and 716th., Limited Employment Divisions and the 21st., Panzer Division. A total of 5 divisions.

The enemy was slow in bringing in reinforcements. This was undoubtedly due, in large measure, to the disruption in his communication caused by pre-D-day bombings.

By D/ 5, the equivalent of two more divisions were opposing our Army. Reinforcements were gradually brought in, until by D/ 30, a total of 5 Field Infantry Divisions 5 Limited Employment Divisions, 1 Panzer Grenadier Division and 1 Paratroop Division, plus elements from other units had been committed against the beach head. Of these, several, namely the 709th. Limited Employment Division, one regiment from the 4th. Paratroop Division and one

A/Tk battalion of the 319th., had been severly reduced by casualties. It is probable that the total enemy strength opposing us on D/30 was the equivalent of about 6 divisions.

VI. ENEMY DEFENSES.

Enemy prepared shore defenses against amphibious attack consisted of the following elements:

1. A number of well emplaced coastal and field batteries sited to cover both sea approaches and beach areas.

2. A line of strongpoints along the coast, close enough in good landing areas to provide interlocking fire over beaches and exits. These were supplemented by groups of rocket projectors just inland, which could lay fire on the beach.

3. Quantities of beach obstacles, mines, wire and anti-tank obstructions placed and organized to hold invading troops within areas of fire of the strongpoints.

The function of this trio was to hold the invader on the beach itself until an effective counter attack could be launched. There was comparatively little prepared ground defense in depth except for anti-landing stakes and mines spread over possible inland aircraft landing areas.

BATTERIES.

Batteries were located well inland or on headlands relatively inaccessable from seaward. They were sited to provide a uniform concentration of fire along most of the coastline, except over the Cherbourg sea approaches where the intensity was very high. Numerous radar stations along the coast as well as visual posts provided them with observation. The types of guns used varied from modern German models to captured pieces of equipment; estimates of ranges therefore, were questionable even though the calibers were estimated quite accurately. The most predominant battery pieces in the area were the 105 FGH and the French (type GPF) 155 MM field gun.

All battery positions, except temporary field positions, had underground shelters and living quarters inter-connected with the gun emplacement by well camouflaged communication trenches, and were protected by machine guns

and anti-tank guns, always surrounded by bands of wire and often with bands of mines. In general the concrete was 6 to 7 feet thick reinforced with ½" round rods spaced 9" on centers horizontally and vertically; the quality of the concrete appeared excellent and the workmanship exceptional; roof slabs were consistently poured onto steel plates which formed the ceilings of the shelters and casemates. In certain cases, for larger caliber guns, roof slabs were as thick as 12'.

Batteries were of the following general types:

(1) Pivot mounted guns in casemates. This comprised the majority of the casemated positions; of the batteries which covered the Assault area, 12 of the 16 positions were casemated or had casemates under construction (actually there were only 15 positions as no. 6A was AA defense for position No. 3) and of these twelve, 7 had pivot mounts, 2 were still under construction but appeared designed for pivot mounts, and 2 positions were not visited.. This also appeared to be the general practice in the area surrounding Cherbourg.

(2) Mobile field guns in casemates. Only the Maisy II battery at 528916 was of this type, however other examples were observed in the Cherbourg area and the casemates at Battery No. 18 may possibly have been for mobile guns.

(3) Mobile guns in open emplacements. Of the positions considered, four were permanent positions (Battery No. 8 was included in this computation although it was partially casemated.) Four positions were temporary awaiting the completion of casemates (No. 9A had log and earth covered underground shelters). There were several additional field positions reported from photographic interpretation, but they were not inspected and there is no definite confirmation that they were occupied at the time of the assault and therefore have not been included in computations for this report.

(4) Railroad batteries. Although there were none of this type which covered the initial assault area there were two positions in the Cotentin Peninsula; the one at Cherbourg was unoccupied and there was no evidence to confirm the caliber; the other position was at 922312 near Cap de la Hague and consisted of two 210 mm

RR guns on turntables, but there were no tracks for removing the guns.

The attached map is a reproduction of the one issued with the intelligence material prior to the invasion, but has been corrected to show the revised bombardment plan. Significant changes as found from ground observation and captured documents are noted in red ink.

Air bombardment and naval gunfire appeared to have been quite accurate and no dummy positions, with the exception of No. 8A, were attacked; this was originally a 6-gun battery of 105 FG Hows, but moved to position 7A and dummy guns installed; this was reported as unoccupied prior to D-day, however. In general the bombardment totally disrupted communications and inflicted reasonable damage to open emplacements; no apparent damage was suffered by the reinforced concrete shelters of casemates with the exception of No. 3 casemate at position 7A which was totally destroyed by naval gunfire. There was much evidence of direct hits and very near hits and in many cases insides of casemates showed effects of shell fragments, but the effectiveness of the guns did not appear to have been impeded. The greatest damage must certainly have been to personnel and morale, for after bombardment the effectiveness of the battery was always reported as poor or negligible.

POINTE DU HOE BATTERY.

Pointe du Hoe battery was considered the number one priority in the bombardment plan for it was the only enemy position which covered both of the beaches and transport areas. Originally there were six 155 mm guns (French type GPF) with an estimated range of 25,000 yards, in open concrete emplacements. It was strategetically located atop a 90 foot high coastal bluff, remote from any large landing beach, surrounded by wire and mine fields and extremely well protected on the flanks by prepared strongpoints. Personnel and ammunition shelters were underground and constructed of heavily reinforced mass concrete. Machine guns position and communication trenches were well dug in and camouflaged. The observation and command post on the seaward edge of the bluff was constructed of heavily reinforced concrete, partially earth banked.

Early in March casemates began to be built near four of the positions; two guns having been removed from their emplacements. It was estimated that by D-day the enemy would probably have two guns in casemates (sited to fire on UTAH) with 4 guns, possibly only 2 guns, with unrestricted arcs of fire remaining in open emplacements.

After this position was captured by Rangers it was found that the guns had been moved from their original positions and placed along a thickly tree arbored lane, completely hidden from air reconnaissance about 1000 yards south of the battery site. The guns were postioned to fire only on UTAH beach, but retained their observation post and main ammunition storage on top of the bluff.

Although there were no guns in the completed casemates (two were ready to receive guns and the other two still under construction) it was learned from prisoners that it was the enemy's intention to install new guns, which were momentarily expected. A captured document from Admiral Hennike's Headquarters revealed the position was intended to house 6 - 155 mm guns.

The maximum range was 19,800 yards; minimum range, 1,300 yards. No's 1 and 6 guns were to remain in open emplacements with all around arc of fire. Guns 2 and 3 were to be in casemates facing 040° and guns 4 and 5 were to be in casemates facing 330°. Casemated guns would be restricted to 120° traverse. This information coincides identically with intelligence reports.

Pre H-hour air bombardment and naval gunfire completely disrupted communications and communication trenches, badly damaged or destroyed open positions, and breached perimeter wire and mine bands. No serious damage was observed on underground shelters, O.P. or finished casemates which were constructed of reinforced concrete, despite many hits.

KNOWN ENEMY BATTERY POSITIONS.

The following tabulation lists the batteries which were in position on D-day and opposed the landings. No attempt has been made to list the many unoccupied, dummy or prepared field positions which could not bear on the D-day assault area. Batteries located in the British sector are

also omitted, with the exception of the casemated positions near Port en Bessin.

For the purpose of this compilation shore reconnaissance was made on all known battery positions from Port en Bessin to Cap de la Hague with the exception of some of the temporary prepared postions for mobile guns and several inaccessible positions on the breakwaters at Cherbourg. A comprehensive detailed analysis of the batteries in the entire Cherbourg peninsula is being prepared to serve as an aid to instruction and planning for future operations and will be disseminated independently to appropriate authorities. A captured document from Headquarters of the Commander of the Normandy Sea Frontier has also been used to confirm and amplify this information.

It must also be noted that this tabulation does not include the individual gun positions, such as casemated 88's and 75's which formed strongpoints, as distinguished from batteries.

No.	GRID	DETAILS AND REMARKS
1	586938	4-155mm guns, Covered under "Pointe du Hoe"
1A	366201	4-170 guns. Casemates were in early stages of construction and badly disrupted by bombing. The document mentioned above confirms the existence of this battery as 4-170mm guns, max. range 31,620 yards, all around arc of fire for guns, but casemates u/c, No's 1 and 2 to face 120° and No's 3 and 4 to face 100°. Casemated guns would have been restricted to 120° traverse. No guns were observed here but at 363202 there were 4 cleverly camouflaged dummy guns.
2	266268	4-240mm guns, max. range 28,444 yds., housed in 3/8" thick steel shields similiar to turrets. Casemates were sufficiently advanced to prevent guns from firing onto assault area. Casemate No. 1 was observed to be partially dismantled to permit gun to fire onto area.
3	368042	3-210mm guns. 2 in casemates with pivot mounts. A fourth gun was intended. Range 32,800 yds. 2 casemates u/c. Originally 6 155mm guns located here, moved to No. 9A.

No.	GRID	DETAILS AND REMARKS
4	355138	Originally occupied by 6-155 guns, but reported as unoccupied after heavy pre D-day bombing with possible exception of two guns. There were no guns present at time of ground observation. Range 18,050 yards.
5	533918	4-155 Hows. 1 gun knocked from its emplacement by naval gunfire or air bombardment; the other 3 guns were withdrawn when the enemy retreated.
5A	797871	4-150mm guns, range 25,160 yds., in casemates. Located in British sector.
6A	369040	6-75mmAA guns. Located on south flank of position 3.
7A	372198	6-105 FGH. Range 13,130 yds. Guns were mounted on pivots in casemates. No. 3 casemate were found to have been completely demolished by Naval Gunfire. Guns had been moved here from position No. 8A about a month and a half prior to D-day.
8	391275	6-155mm Guns. Range 22,540 yds. 3 guns had been installed in casemates by D-day and could not fire onto the assault area. Only 1 gun was found in the open emplacements, however the other 2 guns may have been fired from this site before being withdrawn. Guns were mounted on pivots in the casemates and the gun port was completely shielded by 2 inch thick curved steel plates.
9	360022	4-105 FGH. Range 13,130 yds. Mounted on pivots in casemates.
9A (13A)	361053	5-155mm guns. Range 19,475 yds. Guns were moved here from position No. 3 indicating that the 6th gun had been damaged by pre D-day bombardment. The casemats were in various stages of construction; none ready to receive guns. Guns No's 1 and 6 were to remain with all around arc of fire.

No.	GRID	DETAILS AND REMARKS
14A	361080	4-105 FGH. Range 13,130 yds. Guns were pivot mounted in casemates, moved here from battery position 15, Much evidence of naval bombardment in area; there was a 14" dud resting approx. 100 ft. from casemate no. 3 facing directly at the gun port.
16 16A	528916 531914	4-105 FGH. 3 guns were in casemates, but had been turned around to fire out of rear entrances. 1 casemate was still under construction and the gun was demolished in the open emplacement at 16A. Casemates were for Mobile guns
17	339138	6-105 FGH. Range 13,130 yds. This was a 4-gun battery; two standard casemates with personnel and ammunition shelters incorporated and two smaller casemates with only the gun compartments and small ready ammunition storage; the guns were pivot mounted. The two additional guns were mobile and were sited back of casemate no. 1 to fire towards the south; these were moved in after D-day to give protection on the flanks. Arc of fire for casemates was given as being restricted to 60°.
18	413159	75mm guns in casemates were reported with only one casemate sited to fire onto the assault area. Intelligence broadcast of 14 June reported the strongpoint "appears "effective".

INFANTRY STRONGPOINTS.

Beach strongpoints were elaborately constructed groups of concrete pillboxes, gun casemates and open light gun positions, connected by tunnels and trenches with underground living quarters and magazines. Each was surrounded by a band of wire and mines. Automatic flame throwers were frequently emplaced outside the perimeter, but none appeared to have been used.

On OMAHA strongpoints were located on the cliffs and behind the beach at the foot of the cliffs. Most of the pillboxes and casemates were partially buried in the slope. Positions were connected by tunnels in the cliffs, and communication

was maintained by means of zinc speaking tubes running between stations. Positions were sited to provide cross-fire exits and over the beach. All exits on OMAHA were blocked by ditches or walls.

Strongpoints on UTAH were located along the seawall and on the line of dunes just behind. The seawall presented a continuous barrier to exit from the beach, and strongpoint weapons were sited to sweep the area in front. Deep trenches in the dunes provided communication between stations.

The weapons found in beach strongpoints on OMAHA and UTAH were as follows:

1. German 88 mm:
These were consistently found in concrete casemates three to four feet thick, and sited to fire laterally along the beach. Heavy concrete wing walls protected the openings from gunfire from seaward. The guns were run in from the rear and fired through a narrow slit in front. Some of the casemates had two firing slits, and the gun could be sifted to fire either up or down the beach.

2. 75 mm.
These were mostly obsolete captured weapons. Some were in casemates similar to the 88's but most of them were in simple open emplacements.

3. German 50 mm.
These occured on both pivot and field mounts, and in both pillboxes and open positions. In one case on OMAHA a 50mm field gun was hidden underground invisible from aerial view, and was run out only to fire.

4. 47 and 37 MM tank turrets.
Most of these were old French tank turrets with short barreled weapons. They were mounted over concrete "Torbuk Pits" sunk flush with the ground. On OMAHA they were used rather sparingly, but in UTAH strongpoints there were as many as four or five to a strongpoint. They were located on the dune line and could fire directly on the beach.

5. Infantry mortars, 50mm, 80mm and 81mm.
The usual emplacement for a mortar was a concrete pedestal in an open Tobruk Pit, though some were fired from shallow bowl shaped concrete emplacements and from other

open emplacements. Use of a Tobruk Pit had the advantage that personnel were completely below ground. Panoramas of the field of fire were painted around the inside of the coping of such pits so that fire could be laid on a designated spot on the beach without observation. Most of the emplacements used for mortars on OMAHA were so sited that they could have been used for flat trajectory weapons, instead of on reverse slopes as might have been expected; hence many of them were reported before D-day as machine gun positions. Mortar positions were not found to any extent in UTAH strongpoints.

6. Machine Guns, 50 and 30 cal.
These were found in concrete and timber pillboxes and in open positions. They were sited for direct fire on the beach, for perimeter defense of strongpoints, and for anti-aircraft protection.

Rockets were located several hundred yards behind both beaches in hedgerows. They occurred in groups of 38 firing pits with 4 rockets to a pit. In and near strongpoints on UTAH, and in one strongpoint on OMAHA, were small robot tanks filled with explosive and operated by remote control against boats and troops on the beach. None of these were actually used against landings on American Beaches.

The annotated shoreline sketches show beach defenses' as determined by Photo-Interpretation and where possible, after D-day, by shore reconnaissance.

The approximate total number of active beach defense weapons on each beach is shown in the following table:

For OMAHA - length 7500 yards.

8	Casemates occupied by 75mm or better.
35	Pillboxes occupied by guns smaller than 75.
4	Open field positions 75mm or better.
18	Anti-tank - 37mm to 75mm.
85	Positions less than 37mm (MG).

6 Mortars (Infantry).
38 Rocket pits bearing on the beach, 4 - 32 cm rockets per pit.

For UTAH Beach - Length 9600 yards.

9 Casemates occupied by 75 mm or better.
25 Pillboxes occupied by guns smaller than 75 mm.
2 Open field positions 75 mm or better.
14 Anti-tank guns 37 mm to 75 mm.
65 Positions less than 37 mm (machine guns).
0 Mortars
0 Rocket pits, bearing on the beach.

BEACH OBSTACLES

Steel, concrete and timber underwater obstacles were used on both assault beaches, above the 6 foot contour above LLW on OMAHA, and above the 10 foot contour on UTAH. They consisted of irregular rows of stakes, element "C", hedgehogs, wooden ramps, and concrete tetrahedra. Many of them in the seaward rows had Teller mines lashed to the top, and on OMAHA, mines were buried in the sand along the seaward row. Wire occurred between the obstacles in a few places, and captured documents indicate that it was planned to criss-cross the area with wire. The following table shows in general the order and spacing in which obstacles were encountered on each beach. The attached Shoreline Sketches show the exact position of these obstacles.

OMAHA

CONTOUR ABOVE LLW	TYPE	SPACING CENTER TO CENTER	DISTANCE FROM BACK OF BEACH	APPROX. TOTAL NO.
6 to 11 ft.	Element "C"	65 ft.	240 yards	200
8 to 14 ft.	Stakes	70 ft.	225 yards	2000
8 to 15 ft.	Ramps	65 ft.	190 yards	450
12 to 18 ft.	Hedgehogs	30 ft.	130 yards	1050

UTAH

10 ft.	Ramps	Single Units	275 yards	12
13 ft.	Tetrahedra	30 to 40 ft.	175 yards	150
14 ft.	Stakes	25 to 30 ft.	160 yards	800
15 ft.	Hedgehogs	30 ft.	145 yards	1350
15 ft.	Stakes	25 to 30 ft.	135 yards	800
16 ft.	Stakes	25 to 30 ft.	125 yards	800
(10 to 12 ft.	Element "C" Scattered units - not in typical section)			42

WIRE, MINES AND OBSTRUCTIONS

On OMAHA, wire was used across exits and around strongpoints. Mines were used as perimeter defense for strongpoints and over large areas behind the beaches. Nearly all types of vehicle and personnel mines were encountered. Anti-tank ditches were used across exits on OMAHA except for the western exit which was blocked by an anti-tank masonry wall.

UTAH had wire strung continuously along the top of the seawall as well as around strongpoints. Mines were used around strongpoints, Mines warning signs had been placed around most of the areas between strongpoints, but few mines were found here. Anti-tank ditches were used around strongpoints. The sea wall made a continuous anti-tank barrier along the beach. The inundations behind UTAH, which flooded most of the fields and roads was an effective vehicle obstacle.

MARINE MINES AND MINEFIELDS

(1) Enemy Minefields and Mining Activities. The enemy made extensive use of marine mines as an essential part of his anti-invasion coastal defense system. Minefields were laid off harbor entrances, mouths of rivers, possible landing beaches, and at strategic points in the English Channel. In the American assault area in particular, fields were known to have been placed in the area between St. Vaast and the mouth of the Vire River, in the vicinity of Banc de la Rade, Iles St. Marcouf, and Banc du Cardonnet. Information concerning suspected minefields was disseminated to all forces and units concerned. As was anticipated, the enemy employed his aircraft, E-boats, and other surface craft in laying mines in the assault area after the initial Allied landing had been effected. He also laid additional mines at Cherbourg when it became apparent that the port was a primary Allied objective.

(2) Types of Enemy Mines. As was anticipated, the enemy displayed considerable energy and ingenuity in the development of new types of mines and in the adaption of existing types to meet special conditions. The familiar types (contact, acoustic, acoustic-magnetic, moored, floating, and ground mines) were encountered as well as KATIE mines (a ground contact mine, ususally with a snag or trip line). After D Day a new type mine, the OYSTER, which is of either pressure-acoustic or pressure-magnetic type, was laid by the enemy at night by means of aircraft. Constant sweeping could not guarantee a channel clear of mines because of mines dropped by aircraft in the assault area, mines laid off St. Vaast by E-Boats and carried into the assault area by the current, OYSTER mines for which completely effective countermeasures have not been developed, and mines containing PDM's (Period Delay Mechanisms) or other devices delaying detonation until the lapse of a set time period or until a given number of ships had passed over them.

(49)

VII. BEACHES AND TERRAIN.

Assault beaches "Omaha" and "Utah" lie to the east and west, respectively, of the Carentan estuary in the Bay of the Seine.

"Omaha" beach (Lat. 49° 23' 17" N, Long. 0° 55' 08" W to Lat. 49° 21' 36" N, Long 0° 50' 10" W) is 7,500 yards in length and is composed of firm sand and shingle. The gradient is in general flat up to mean level (13 ft.), then increasingly steep. Sand bars, some of which shifted during a storm shortly before D-day, exist within the tidal area. Except for its western end, the beach is backed by a low wave cut embankment, faced by a masonry wall for part of its length. Behind the embankment a level sandy grass covered shelf extends about 100 yards to an 80 foot grassy bluff, broken by four natural valley exits through which run roads. A level cultivated plateau lies inland of this section of the coast.

"Utah" beach (Lat. 49° 28' 26", Long. 1° 14' 39" W to Lat. 49° 24' 38" N, Long. 1° 10' 18" W) is 9,655 yards in length and is composed of compact gray sand with many ridges and runnels which are subject to frequent and sudden shifting as a result of storms. The gradient is very flat up to mean level (12.8 feet), thereafter it is slightly steeper. The beach is backed for its entire length by a masonry sea wall, behind which from the center of the beach southward, an area of sand dunes extends nearly 150 yards inland. Artificially inundated lowlands lie inland behind the entire beach area. Across these flooded meadows from the beach are 6 roads, only three of which were useable. The inundated area was from one mile to a mile and a half in width, and the water was less than two feet in depth with thick deep mud beneath. Behind the flooded area lies a relatively firm, well drained countryside. The planned assault area for "Utah" beach was from Lat. 49° 26' 24" N, Long 1° 12' 19" W to Lat. 49° 25' 34" N, Long 1° 11' 11" W., with a space dividing Red and Green Beaches. Actually, the assault was made approximately 1000 yards to the southeast of the planned landing place as the result of the early loss of the control vessels, and the error probably caused by drift.

VIII. COMBAT INTELLIGENCE

Combat intelligence consisted primarily of information concerning probable enemy capabilities and reaction, enemy minefields and batteries, demolitions in the port of Cherbourg, location of enemy naval units, and of the Army situation ashore.

Information was received from various sources, mainly however from ANCXF, First U.S. Army, the Admiralty, U.S. Naval Intelligence units on the far shore, assault force commanders, and photo reconnaissance.

Information received, after being evaluated, was disseminated in the form of nightly intelligence despatches, special charts showing mined areas, mine warning despatches, bulletins concerning demolitions accomplished and intended in Cherbourg, and daily situation reports. Information concerning enemy batteries situated on the east and north coasts of the Cotentin Peninsula with their arcs of fire was furnished in both written and graphic form to the naval force which bombarded the defenses of Cherbourg. The approach of enemy E-boats and hostile aircraft was promulgated over the TBS.

IX. CONCLUSIONS.

The intelligence disseminated before the assault proved to be complete and accurate.

The importance of photographic interpretation in the planning for an operation of this character cannot be over emphasized. The substitution of graphic aids for written material wherever possible proved sound.

The enemy did not make the all out naval and air effort to oppose the Allied Landing which had been anticipated. The scale of enemy surface, submarine, and air attack was far below what had been expected. The army rate of build up, particularly of armored units, was considerably slower than had been believed probable. This is probably attributable to the effective disruption of the enemy's lines of communications by allied bombing and to the enemy's decision to hold some of his forces in reserve to meet the threat of landings elsewhere.

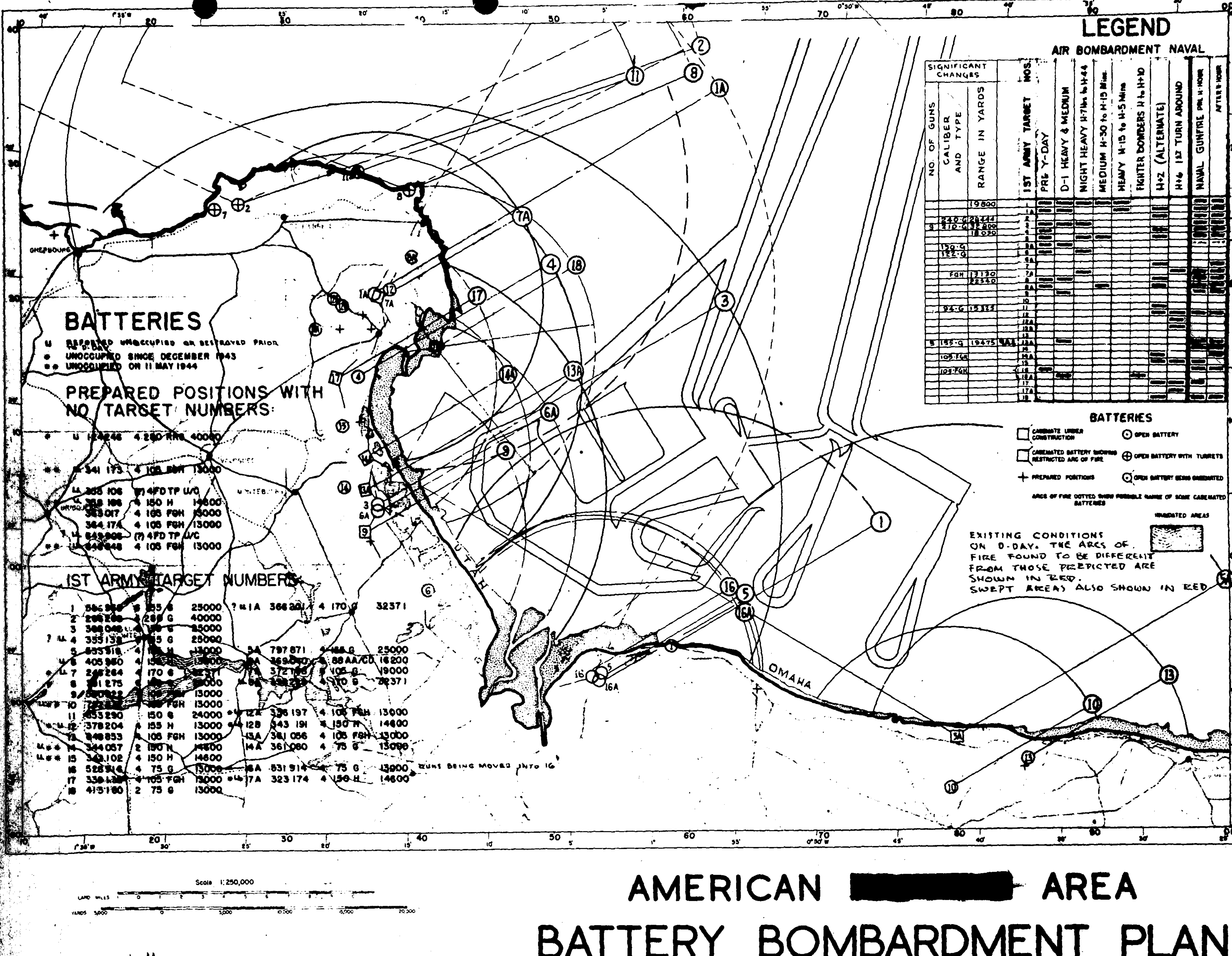
X. RECOMMENDATIONS

Adequate photographic processing facilities should be made available. In the early planning stage, lack of these facilities caused a delay of from five (5) to twenty-two (22) days in receiving prints of reconnaissance sorties.

Photographs in color of the area should be obtained for the purpose of determining distinctive terrain colors or colored landmarks which might serve as points of identification.

Very close liaison should be maintained between all planning echelons to obviate the duplication of effort in the field of intelligence.

(51)



AMERICAN [redacted] AREA
BATTERY BOMBARDMENT PLAN

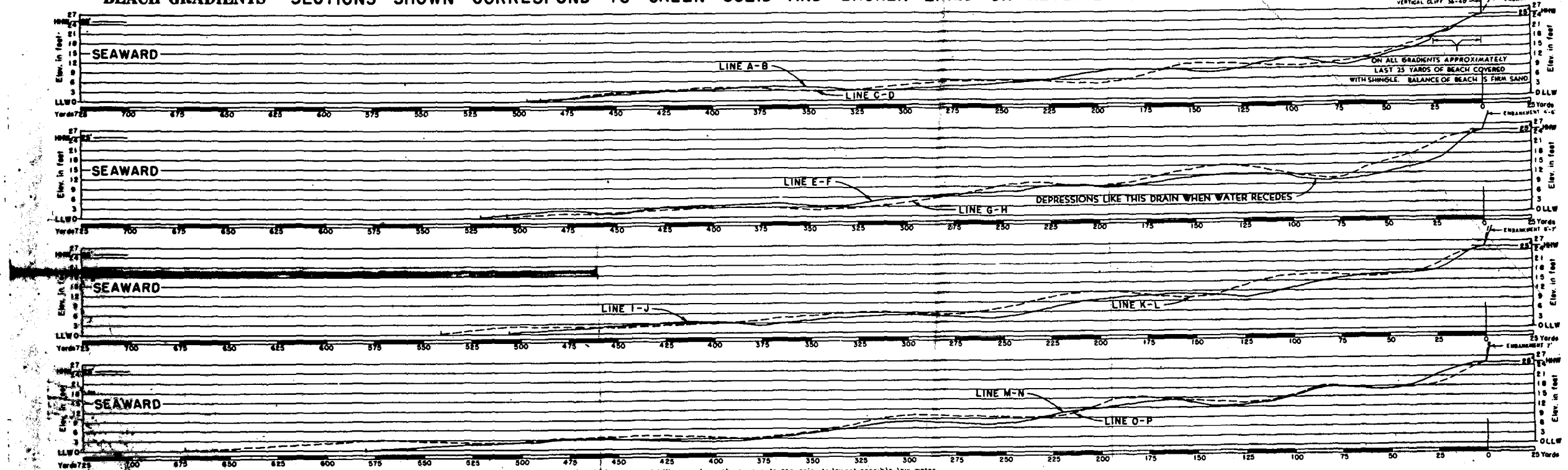
NOTE: INFORMATION FOR THIS DIAGRAM WAS COMPILED FROM THE FOLLOWING SOURCES BY COMMANDER TASK FORCE ONE TWO TWO, U.S.N., 18 MAY 1944.

(1) U.S FIRST ARMY PRE-ARRANGED AIR & NAVAL BOMBARDMENT PLAN (REV. ANNEX 12), 10 APRIL '44, AND CHANGES 24 APRIL '44, 14 MAY '44.
(2) COMMANDER SUPPORT FORCE AIR SPOT DESTRUCTION SCHED. 11 MAY '44.
(3) FORCE "O" LETTER SERIAL 00616, ENCLOSURE E, 9 MAY '44.
(4) BATTERY CHARACTERISTICS FROM SHAEF, ANCXF, AND TIS.

AERIAL PHOTOGRAPHS AND GSGS 4249 MAPS, SHEETS 5E, 6E, & 7F.

(52)

48



SUNLIGHT AND MOONLIGHT TABLE

MAY 25 TO JUNE 21, 1944

ALL TIMES SHOWN ARE MST (GMT PLUS 2 HOURS)

FIRST LIGHT and LAST LIGHT are here defined as the beginning and ending respectively of Civil Twilight (Sun 6° below the horizon).

DAY OF MONTH	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	MAY							JUNE																				
FIRST LIGHT	0528	0527	0526	0525	0524	0523	0522	0521	0520	0519	0518	0517	0516	0516	0516	0515	0514	0514	0514	0513	0513	0513	0512	0512	0512	0512	0512	0513
SUNRISE	0608	0607	0606	0605	0604	0604	0603	0602	0601	0601	0600	0559	0558	0558	0558	0557	0557	0557	0557	0557	0557	0556	0556	0556	0557	0557	0557	0557
SUNSET	2154	2155	2156	2157	2159	2200	2201	2202	2203	2204	2205	2206	2207	2208	2208	2209	2210	2210	2211	2211	2212	2212	2212	2213	2213	2214	2214	2214
LAST LIGHT	2234	2235	2237	2238	2239	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2255	2256	2256	2256	2257	2257	2257	2258
MOONRISE	*0853*	*0948*	*1048*	*1150*	*1252*	*1356*	*1459*	*1603*	*1708*	*1815*	*1924*	*2033*	*2144*	2250	2351		0043	0126	0202	0232	0258	0324	0349	0415	0444	*0517*	*0556*	*0642*
MOONSET	0011	0102	0145	0220	0250	0315	0337	0359	0419	0441	0504	*0531*	*0604*	*0643*	*0742*	*0831*	*0940*	*1054*	*1211*	*1329*	*1445*	*1602*	*1715*	*1832*	*1945*	*2054*	*2158*	*2254*
PHASE OF MOON	)	)	)	◗	◗	◗	◗	○	○	○	○	○	○	○	○	○	○	○	◖	◖	◖	◖	(	(	(	(		

Moonrise and Moonset figures in *italic* indicate that moonrise and/or moonset occur during daylight, i.e., between First Light and Last Light.

BEACH GRADIENTS SECTIONS SHOWN CORRESPOND TO GREEN SOLID AND BROKEN LINES ON REVERSE SIDE OF THIS SHEET IDENTIFIED BY LETTERS

CAUTION: The vertical scale is *5 times* the horizontal scale. HHW on each graph represents approximate highest possible high water. LLW on each graph represents approximate lowest possible low water.

CURRENTS

The currents in this region are complex and their detailed behavior little known. In general, they flow eastward along the shore as the tide rises, reach a maximum about half tide, become slack during high water stand and then reverse, flowing westward as the tide falls, again reaching a maximum at about half tide and becoming slack near the time of low water. Maximum currents are experienced during spring tides and minimum currents, during neap tides. Maximum currents attain velocities of about 2.7 knots at a distance of five miles offshore and decrease as they approach the shore, becoming about 2.2 knots at a distance of one mile offshore. The currents slack and reverse directions somewhat sooner near the shore than to seaward. Closer inshore than one mile, the current directions become more confused as the depths decrease, but in general, the velocities also decrease, and it is reasonable to assume that they become insignificant at the proposed grounding points. The following table of currents has been compiled from all the available information. The listed values have been estimated from measured values at other points along the coast, and so should be treated as estimates only. Strong and persistent winds may cause considerable departure from the average values shown in the table.

ESTIMATED INSHORE CURRENTS

Use with caution

Time Referred to the end of High Water Stand (see tide curves)	5 Miles Out Set	5 Miles Out Drift Kts During Spring Tides	5 Miles Out Drift Kts During Neap Tides	2½ Miles Out Set	2½ Miles Out Drift Kts During Spring Tides	2½ Miles Out Drift Kts During Neap Tides	1 Mile Out Set	1 Mile Out Drift Kts During Spring Tides	1 Mile Out Drift Kts During Neap Tides
6 hours before	E	0.3	0.1	E	0.5	0.3	E	0.7	0.6
5 hours before	E	1.8	1.1	E	2.1	1.2	E	1.6	1.1
4 hours before	E	2.7	1.6	E	2.5	1.5	E	2.2	1.3
3 hours before	E	2.6	1.5	E	2.2	1.3	E	1.4	1.1
2 hours before	E	1.6	0.9	E	1.1	0.6	E	0.7	0.4
1 hour before	E	0.7	0.4	E	0.2	0.1	W	0.3	0.2
End of high water stand	W	0.1	0.1	W	0.8	0.5	W	1.3	0.7

Time Referred to the end of High Water Stand (see tide curves)	5 Miles Out Set	5 Miles Out Drift Kts During Spring Tides	5 Miles Out Drift Kts During Neap Tides	2½ Miles Out Set	2½ Miles Out Drift Kts During Spring Tides	2½ Miles Out Drift Kts During Neap Tides	1 Mile Out Set	1 Mile Out Drift Kts During Spring Tides	1 Mile Out Drift Kts During Neap Tides
End of high water stand	W	0.1	0.1	W	0.8	0.5	W	1.3	0.7
1 hour after	W	2.3	1.3	W	2.1	1.2	W	1.7	1.0
2 hours after	W	2.7	1.6	W	2.5	1.5	W	2.0	1.2
3 hours after	W	2.7	1.6	W	2.5	1.5	W	2.0	1.2
4 hours after	W	2.3	1.3	W	2.1	1.3	W	1.7	1.0
5 hours after	W	1.3	0.8	W	1.0	0.6	W	0.6	0.3
6 hours after	W	0.2	0.1	W	Slack	0	E	0.2	0.1

Example of the Use of the Current Table

Suppose that it is desired to determine the inshore currents at 0600 MST on 10 June. From the tidal curves below it is seen that 10 June lies about one third between spring and neap tides, the last spring tide having occurred on 7 June and the next neap tide being expected on 14 June; the end of high water stand on 10 June is seen to be 0330 MST. Since 0600 is 2 hours and 30 minutes after the end of high water stand, the current table is entered with this value, and the probable currents found to be between 2.6 and 1.5 knots at five miles offshore, between 2.3 and 1.3 knots at two and one half miles offshore, between 1.8 and 1.1 knots at one mile offshore. Close interpolation is not warranted in general, but may be made, if desired, to allow for the period from the last spring tide. If this is done, the most probable values of 2.2 knots, 2.0 knots, and 1.4 knots, are found for five miles, two and one half miles and one mile offshore, respectively.

MAY 30 and 31 – NEAP TIDES
JUNE 7 and 8 – SPRING TIDES

TIDAL STAGES

ALL TIMES SHOWN ARE M.S.T. (G.M.T. PLUS 2 HOURS)

The accompanying tidal curves show the height of the water at any time above the approximate level of lowest low water. Soundings are shown on the chart in plain brown figures (not circled) and they represent depths measured at lowest low water. To find the depth at these points at any time:

(1) Find the height of the tide in feet at the time in question, from the tidal curve.

(2) ADD the sounding figure to height of the tide. The sum gives the depth of water in feet at the time and place in question.

FOR EXAMPLE: At 1600 on June 9th the height of tide is 13 ft. The sounding figure at the point considered is 15 ft.: 15 ft. plus 13 ft. equals 28 ft. depth.

The circled brown figures in the water area between the high high and low low water marks represent points which are sometimes above water. These figures give the heights of the beach in feet above the approximate level of lowest low water. To find the depth of water at any time over these points, proceed as follows:

(1) Find the height of the tide in feet at the time in question from the tidal curve.

(2) SUBTRACT the circled brown figure from the height of tide. The result is the depth of water in feet at the time and place in question. If the circled brown figure is greater than the height of the tide and cannot be subtracted, it means that the point will be above water at this time.

FOR EXAMPLE: At 0130 on June 21st the height of tide is 20.5 ft. The beach height figure at the point considered is 9 ft.: 20.5 ft. minus 9 ft. equals 11.5 depth.

The soundings on the high water fathom lines (figures in blue on chart) should not be used to compute such depths. The high water fathom lines are shown on the chart merely to give an idea of the underwater beach contours between the high high water and low low water marks.

WARNING ON TIDAL, SOUNDING AND BEACH CONTOUR FIGURES

Any tidal, sounding and beach contour figures, even for familiar home waters, are only approximate. The combined influences of wind and atmospheric pressure alone may cause variations from the predicted heights of high water and low water, amounting to as much as 1½ feet. For enemy waters these figures are likely to be even more subject to error due to difficulties of obtaining recent, accurate tidal and sounding information. Beach contours based on such sounding figures may also be subject to [illegible]. Tides may form gullies and ridges in the sand parallel and [illegible] to the beach which will not show on navigation charts. [illegible] USE ALL TIDAL, SOUNDING AND BEACH CONTOUR FIGURES WITH EXTREME CAUTION. ALWAYS ALLOW A SUFFICIENT SAFETY FACTOR BY FIGURING THE WATER MAY BE A [illegible] LOWER THAN CALCULATED. WHEN NAVIGATING [illegible] OR SANDBARS ALLOW AN ADDITIONAL SAFETY FACTOR.

[illegible]: All soundings on chart and all readings on graphs are [illegible]

– Indicates beginning and end of high water stand. – Indicates low water point.

JUNE 20 and 21 – SPRING TIDES
JUNE 14 and 15 – NEAP TIDES

"0" feet equals datum [illegible] soundings as shown on chart. (Approximat

50

SUNLIGHT AND MOONLIGHT TABLE

MAY 25 TO JUNE 21, 1944

ALL TIMES SHOWN ARE MST (GMT PLUS 2 HOURS)

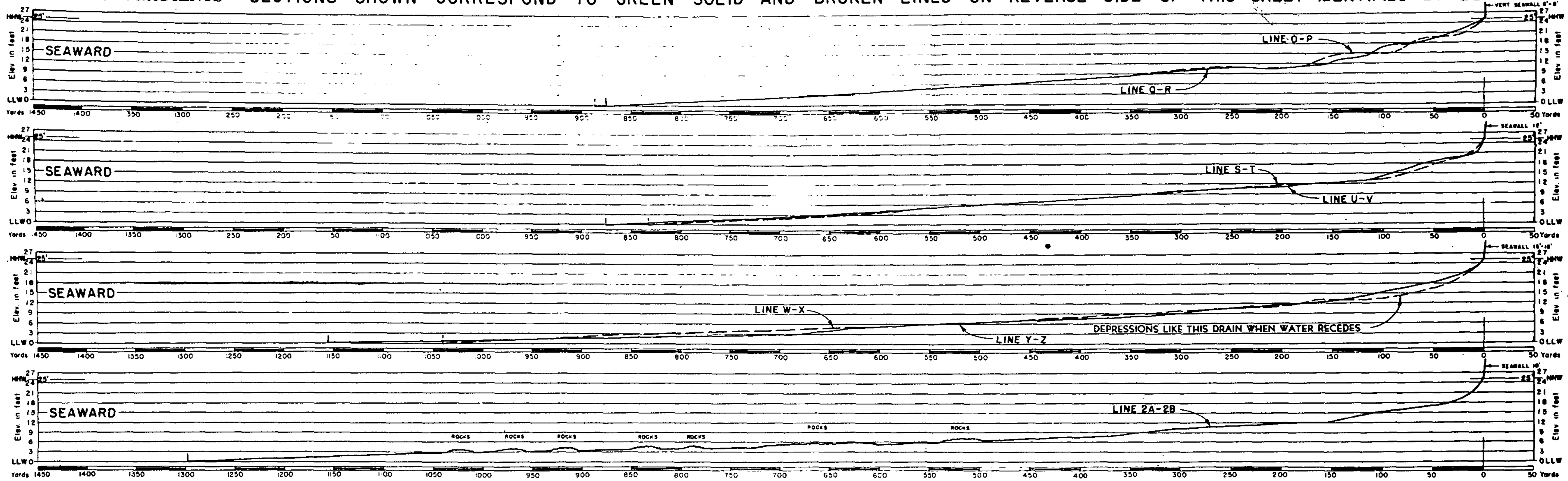
FIRST LIGHT and LAST LIGHT are here defined as the beginning and ending respectively of Civil Twilight (Sun 6° below the horizon).

	MAY							JUNE																				
DAY OF MONTH	25	26	27	28	29	30	3		2	3	4	5	6	7	8	9	10		12	13	14	15	16	17	18	19	20	21
FIRST LIGHT	0528	0527	0526	0525	0524	0523	0522	052	0520	05 9	05 8	05 7	05 6	05 6	05 6	05 5	05 4	0514	0514	0513	0513	0513	0512	0512	0512	0512	0512	0513
SUNRISE	0608	0607	0606	0605	0604	0604	0603	0602	060	060	0600	0559	0558	0558	0558	0557	0557	0557	0557	0557	0557	0556	0556	0556	0557	0557	0557	0557
SUNSET	2 54	2 55	2 56	2 57	2 59	2200	220	2202	2203	2204	2205	2206	2207	2208	2208	2209	22 0	22 0	2211	2211	2212	22 2	22 2	2213	2213	2214	2214	2214
LAST LIGHT	2234	2235	2237	2238	2239	224	2242	2243	2244	2245	2246	2247	2248	2249	2250	225	2252	2253	2254	2255	2255	2256	2256	2256	2257	2257	2257	2258
MOONRISE	*0853*	*0948*	*1048*	*50*	*252*	*356*	*459*	*603*	*708*	*8 5*	*1924*	*2033*	*2 44*	2250	2351		0043	0126	0202	0232	0258	0324	0349	0415	0444	*0517*	*0556*	*0642*
MOONSET	0011	0102	0145	0220	0250	03 5	0337	0359	04 9	044	0504	*053*	*0604*	*0643*	*0742*	*0831*	*0940*	*1054*	*1211*	*1329*	*1445*	*1602*	*1715*	*1832*	*1945*	*2054*	*2158*	*2254*
PHASE OF MOON						FIRST QTR							FULL MOON							LAST QTR								

Moonrise and Moonset figures in *italic* indicate that moonrise and or moonset occur during daylight, i.e. between First Light and Last Light

BEACH GRADIENTS

SECTIONS SHOWN CORRESPOND TO GREEN SOLID AND BROKEN LINES ON REVERSE SIDE OF THIS SHEET IDENTIFIED BY LETTERS



CAUTION The vertical scale is *10 times* the horizontal scale HHW on each graph represents approximate highest possible high water LLW on each graph represents approximate lowest possible low water

CURRENTS

The currents in this region are complex and little known. In general, they flow SE or S as the tide rises, reach a maximum just before high water, become slack shortly after high water and then reverse, flowing NW as the tide falls, again reaching a maximum just before low water and becoming slack soon after low water. Maximum currents are experienced during spring tides and minimum currents, during neap tides. *Maximum currents attain velocities of about 3.3 knots at a distance of five miles off shore and decrease as they approach the shore, becoming about 1.9 knots at a distance of one mile offshore.* The currents slack and reverse direction somewhat sooner nearer the shore than to seaward. Closer inshore than one mile, the current directions become more confused as the depths decrease, but in general the velocities also decrease, and it is reasonable to assume that they become insignificant at the proposed landing points. The following table of currents has been compiled from all the available information. The listed values have been estimated from measured values at other points along the coast and so should be treated as estimates only. Strong and persistent winds may cause considerable departure from the average values shown in the table.

ESTIMATED INSHORE CURRENTS

Use with caution

Time Referred to Time of High Water (see tide curves)	5 Miles Out Set	5 Miles Out Drift Kts During Spring Tides	5 Miles Out Drift Kts During Neap Tides	2½ Miles Out Set	2½ Miles Out Drift Kts During Spring Tides	2½ Miles Out Drift Kts During Neap Tides	1 Mile Out Set	1 Mile Out Drift Kts During Spring Tides	1 Mile Out Drift Kts During Neap Tides
6 hours before	NW	2.5	1.4	NW	0.9	0.5	NW	0.5	0.3
5 hours before	NW	1.8	1.0	Slack	0	0	SE	0.3	0.2
4 hours before	NW	0.9	0.5	S	0.8	0.5	SE	1.2	0.7
3 hours before	SE	0.3	0.2	S	1.7	1.0	SE	1.7	1.0
2 hours before	SE	2.6	1.5	S	2.3	1.3	SE	1.9	1.1
1 hour before	SE	3.3	1.9	S	2.1	1.2	SE	1.7	1.0
High Water	SE	1.4	0.8	S	0.8	0.5	Slack	0	0
High Water	SE	1.4	0.8	S	0.8	0.5	Slack	0	0
1 hour after	SE	0.3	0.2	NW	0.5	0.3	NW	0.9	0.5
2 hours after	NW	0.6	0.3	NW	1.2	0.7	NW	1.5	0.9
3 hours after	NW	1.4	0.8	NW	1.8	1.0	NW	1.8	1.0
4 hours after	NW	2.4	1.4	NW	2.3	1.3	NW	1.9	1.1
5 hours after	NW	2.8	1.6	NW	2.1	1.2	NW	1.6	0.9
6 hours after	NW	2.7	1.5	NW	1.4	0.8	NW	0.9	0.5

Example of the Use of the Current Table

Suppose that it is desired to determine the inshore currents at 1500 MST on 10 June.

From the tide curves below it is seen that 10 June lies about one third between spring and neap tides, the last spring tide having occurred on 8 June and the next neap tide being expected on 14 June; high water on the morning of 10 June is seen to occur at 1035 MST. Since 1500 is 4 hours and 25 minutes after high water, the current table is entered with this value and the probable currents found to be between 2.6 and 1.5 knots at five miles offshore, between 2.2 and 1.3 knots at two and one half miles offshore and between 1.8 and 1.0 knots at one mile offshore. Closer interpolation is not warranted, in general, but may be made, if desired, to allow for the period from the last spring tide. If this is done, the most probable values of 2.2 knots, 1.9 knots and 1.5 knots are found at five miles, two and one half miles and one mile offshore, respectively.

TIDAL STAGES

ALL TIMES SHOWN ARE M.S.T. (G.M.T. PLUS 2 HOURS)

The accompanying tidal curves show the height of the water at any time above the approximate level of lowest low water. Soundings are shown on the chart in plain brown figures (not circled) and they represent depths measured at lowest low water. *To find the depth at these points at any time:*

(1) Find the height of the tide in feet at the time in question, from the tidal curve.

(2) ADD the sounding figure to height of the tide. The sum gives the depth of water in feet at the time and place in question.

FOR EXAMPLE. At 1135 on June 3rd the height of tide is 14.5 ft. The sounding figure at the point we select is 15 ft., 15 ft. plus 14.5 ft. equals 29.5 ft. depth.

The circled brown figures in the water area between the high high and low low water marks represent points which are sometimes above water. These figures give the height of the beach in feet above the approximate level of lowest low water. To find the depth of water at any time over these points, proceed as follows:

(1) Find the height of the tide in feet at the time in question from the tidal curve.

(2) SUBTRACT the circled brown figure from the height of tide. The result is the depth of water in feet at the time and place in question. If the circled brown figure is greater than the height of the tide and cannot be subtracted, it means that the point will be above water at this time.

FOR EXAMPLE. At 1445 on June 11th the height of tide is 20 ft. The beach height figure at the point we select is 9 ft., 20 ft. minus 9 ft. equals 11 ft. depth.

The soundings on the high water fathom lines (figures in blue on chart) should not be used to compute spot depths. The high water fathom lines are shown on the chart merely to give an idea of the underwater beach contours between the high high water and low low water marks.

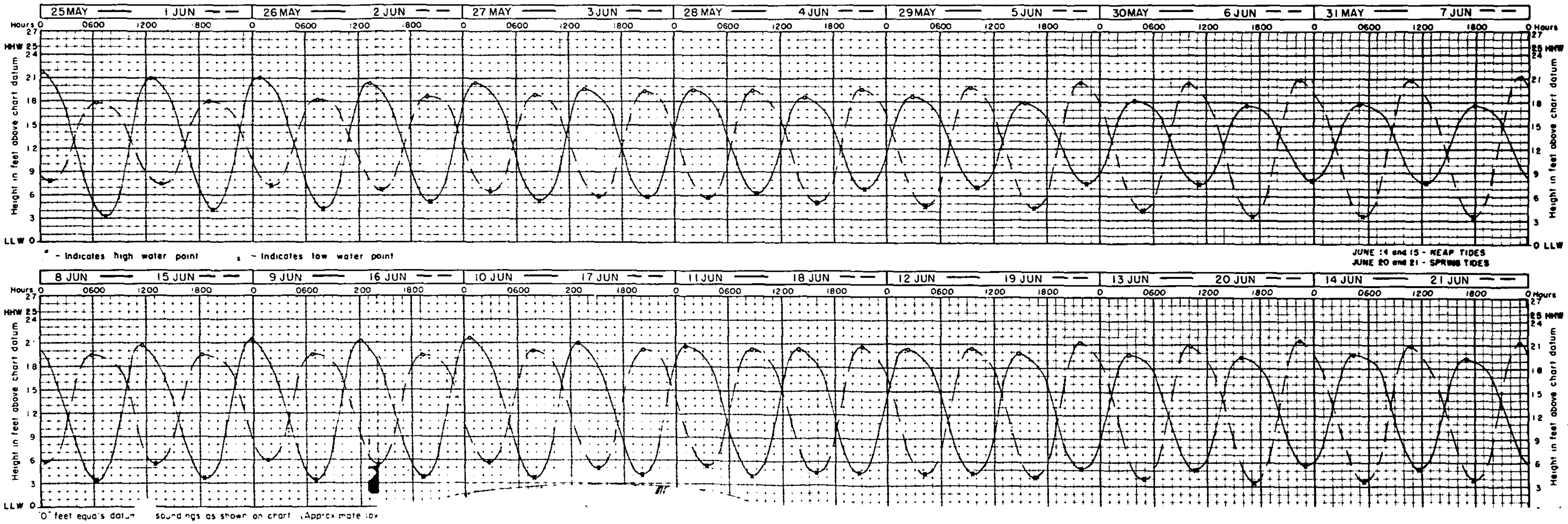
WARNING ON TIDAL, SOUNDING AND BEACH CONTOUR FIGURES

Any tidal, sounding and beach contour figures, even for familiar home waters, are only approximate. The combined influence of wind and atmospheric pressure alone may cause variations from the predicted heights of high water and low water, amounting to as much as 1 , feet. For enemy waters these figures are likely to be even more subject to error due to difficulties of obtaining recent accurate tidal and sounding information. Beach Gradients based on such sounding figures may also be subject to inaccuracies. Tides may form grooves and ridges in the sand parallel and perpendicular to the beach which *will not show on navigation charts.* THEREFORE, USE ALL TIDAL, SOUNDING AND BEACH CONTOUR FIGURES WITH EXTREME CAUTION. ALWAYS ALLOW A SUFFICIENT SAFETY FACTOR BY FIGURING THE WATER MAY BE A FEW FEET SHALLOWER THAN CALCULATED. WHEN NAVIGATING NEAR ROCKS OR SANDBARS ALLOW AN ADDITIONAL SAFETY FACTOR.

IMPORTANT. **All soundings on chart and all readings on graphs are in FEET.**

MAY 30 and 31 - NEAP TIDES
JUNE 7 and 8 - SPRING TIDES

JUNE 14 and 15 - NEAP TIDES
JUNE 20 and 21 - SPRING TIDES



• - Indicates high water point x - Indicates low water point

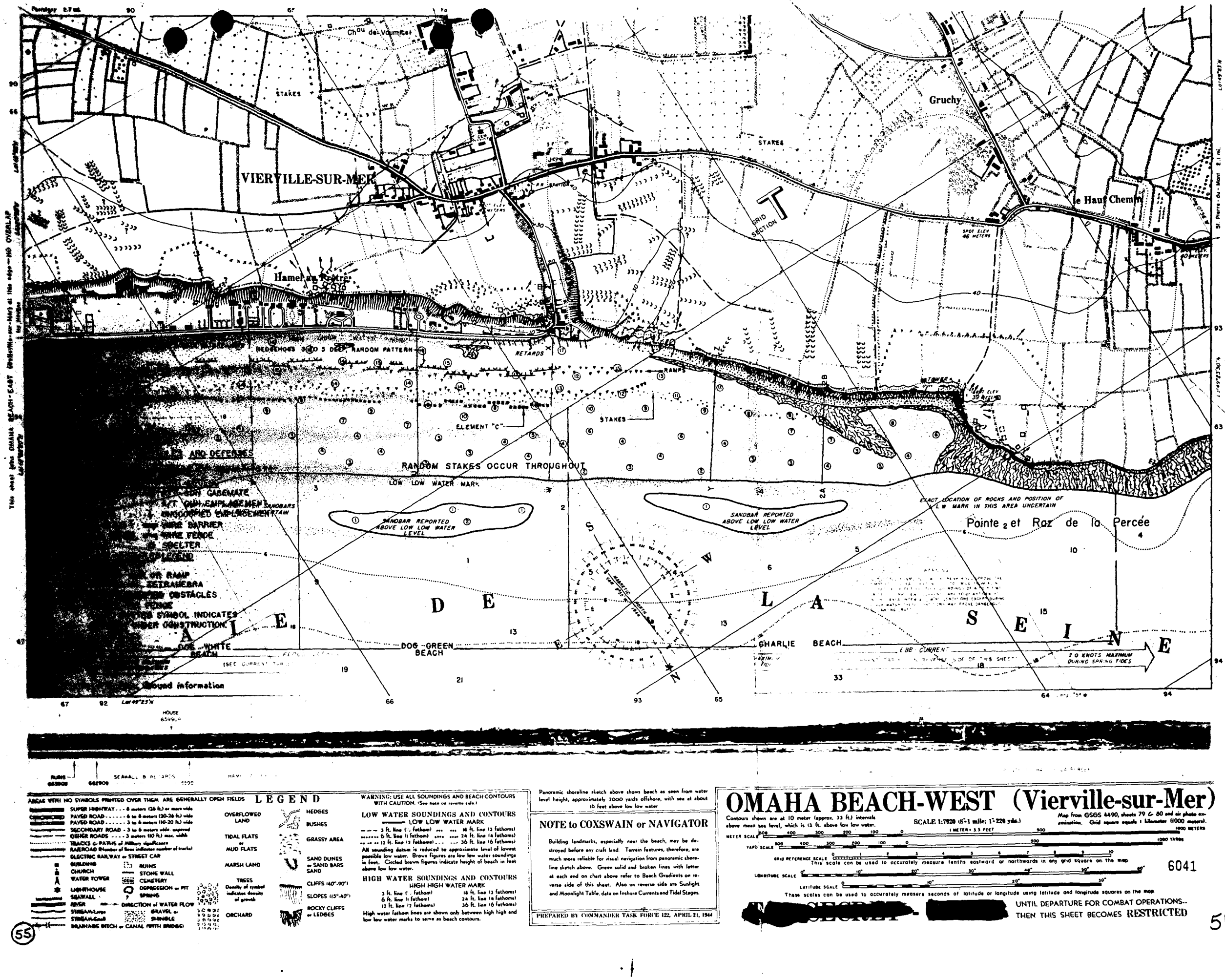
"0" feet equals datum soundings as shown on chart (Approximate low

56

(60)

WAR-NAVY DEPARTMENT
ARMY AND NAVY STAFF COLLEGE
NEW WAR DEPARTMENT BUILDING
21ST AND VIRGINIA AVE., N. W.
WASHINGTON 25, D. C.

OFFICIAL BUSINESS



AREAS WITH NO SYMBOLS PRINTED OVER THEM ARE GENERALLY OPEN FIELDS

LEGEND

SUPER HIGHWAY - - - 8 meters (26 ft.) or more wide
PAVED ROAD - - - - - - 6 to 8 meters (20-26 ft.) wide
PAVED ROAD - - - - - - 3 to 6 meters (10-20 ft.) wide
SECONDARY ROAD - 3 to 6 meters wide, improved
OTHER ROADS - - - - 3 meters (10 ft.) max. width
TRACKS & PATHS of Military significance
RAILROAD (Number of lines indicates number of tracks)
ELECTRIC RAILWAY or STREET CAR

BUILDING — RUINS
CHURCH — STONE WALL
WATER TOWER — CEMETERY
LIGHTHOUSE — DEPRESSION or PIT
SEAWALL — SPRING
RIVER — DIRECTION OF WATER FLOW
STREAM-Large — GRAVEL or
STREAM-Small — SHINGLE
DRAINAGE DITCH or CANAL (WITH BRIDGE)

OVERFLOWED LAND
TIDAL FLATS or MUD FLATS
MARSH LAND
TREES — Density of symbol indicates density of growth
ORCHARD

HEDGES
BUSHES
GRASSY AREA
SAND DUNES or SAND BARS SAND
CLIFFS (40°-90°)
SLOPES (15°-40°)
ROCKY CLIFFS or LEDGES

WARNING: USE ALL SOUNDINGS AND BEACH CONTOURS WITH CAUTION. (See note on reverse side)

LOW WATER SOUNDINGS AND CONTOURS

LOW LOW WATER MARK
3 ft. line (½ fathom) — 18 ft. line (3 fathoms)
6 ft. line (1 fathom) — 24 ft. line (4 fathoms)
12 ft. line (2 fathoms) — 36 ft. line (6 fathoms)

All sounding datum is reduced to approximate level of lowest possible low water. Brown figures are low low water soundings in feet. Circled brown figures indicate height of beach in feet above low low water.

HIGH WATER SOUNDINGS AND CONTOURS

HIGH HIGH WATER MARK
3 ft. line (½ fathom) — 18 ft. line (3 fathoms)
6 ft. line (1 fathom) — 24 ft. line (4 fathoms)
12 ft. line (2 fathoms) — 36 ft. line (6 fathoms)

High water fathom lines are shown only between high high and low low water marks to serve as beach contours.

Panoramic shoreline sketch above shows beach as seen from water level height, approximately 2000 yards offshore, with sea at about 16 feet above low low water.

NOTE to COXSWAIN or NAVIGATOR

Building landmarks, especially near the beach, may be destroyed before any craft land. Terrain features, therefore, are much more reliable for visual navigation from panoramic shoreline sketch above. Green solid and broken lines with letter at each end on chart above refer to Beach Gradients on reverse side of this sheet. Also on reverse side are Sunlight and Moonlight Table, data on Inshore Currents and Tidal Stages.

PREPARED BY COMMANDER TASK FORCE 122, APRIL 21, 1944

OMAHA BEACH-WEST (Vierville-sur-Mer)

Contours shown are at 10 meter (approx. 33 ft.) intervals above mean sea level, which is 13 ft. above low low water.

SCALE 1:7920 (8"=1 mile; 1"=220 yds.)

Map from GSGS 4490, sheets 79 & 80 and air photo examination. Grid square equals 1 kilometer (1000 meters).

METER SCALE 1 METER = 3.3 FEET

YARD SCALE

GRID REFERENCE SCALE — This scale can be used to accurately measure tenths eastward or northwards in any grid square on the map.

LONGITUDE SCALE

LATITUDE SCALE

These scales can be used to accurately measure seconds of latitude or longitude using latitude and longitude squares on the map.

6041

[redacted] SECRET [redacted]

UNTIL DEPARTURE FOR COMBAT OPERATIONS--
THEN THIS SHEET BECOMES RESTRICTED

55

51

SUNLIGHT AND MOONLIGHT TABLE

MAY 25 TO JUNE 21, 1944

ALL TIMES SHOWN ARE MST (GMT PLUS 2 HOURS)

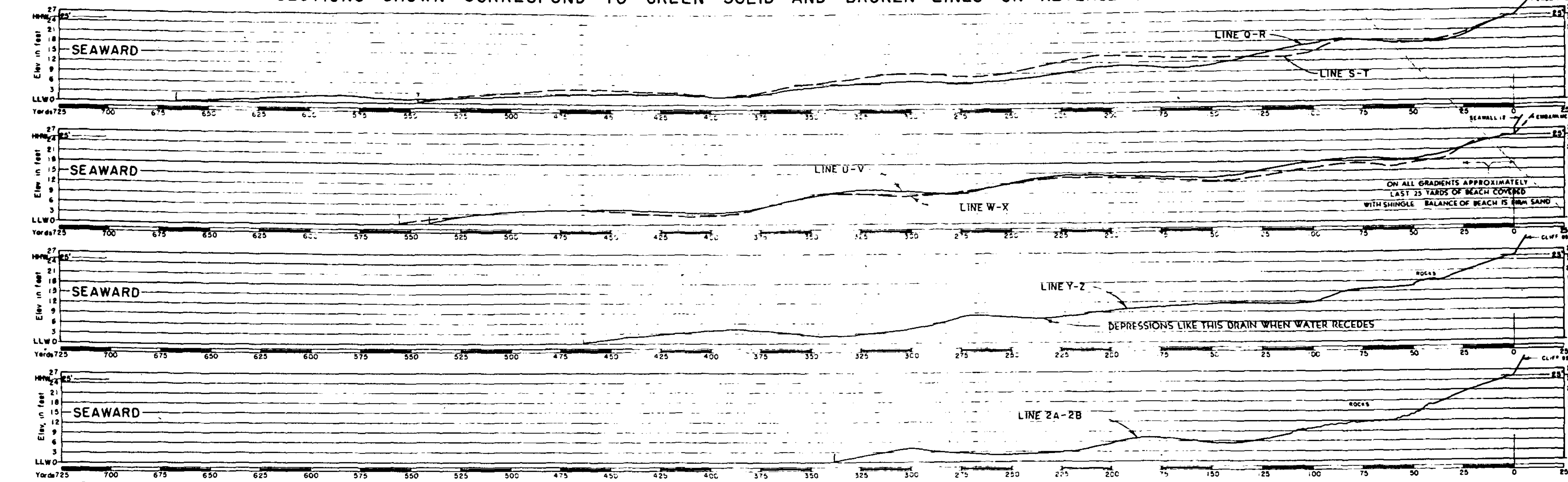
FIRST LIGHT and LAST LIGHT are here defined as the beginning and ending respectively of Civil Twilight (Sun 6° below the horizon).

DAY OF MONTH	25 (May)	26	27	28	29	30	3
FIRST LIGHT	0528	0527	0526	0525	0524	0523	0522
SUNRISE	0608	0607	0606	0605	0604	0604	0603
SUNSET	2 54	2 55	2 56	2 57	2 59	2200	220
LAST LIGHT	2234	2235	2237	2238	2239	224	2242
MOONRISE	*0853*	*0948*	*1048*	*1 50*	*1252*	*1356*	*1459*
MOONSET	00[illegible]	0102	0145	0220	0250	03 5	0337
PHASE OF MOON						First Qtr	

DAY OF MONTH (June)		2	3	4	5	6	7	8	9	0		2	3	4	5	6	7	8	9	20	21
FIRST LIGHT	052?	0520	05 9	05 8	05 7	05 6	05 6	05 6	0515	05 4	05 4	0514	0513	0513	05 3	0512	0512	0512	05 2	0512	0513
SUNRISE	0602	060	060	0600	0559	0558	0558	0558	0557	0557	0557	0557	0557	0557	0556	0556	0556	0557	0557	0557	0557
SUNSET	2202	2203	2204	2205	2206	2207	2208	2208	2209	22 0	22 0	22	2211	22 2	22 2	22 2	22 3	2213	22 4	2214	2214
LAST LIGHT	2243	2244	2245	2246	2247	2248	2249	2250	225	2252	2253	2254	2255	2255	2256	2256	2256	2257	2257	2257	2258
MOONRISE	*603*	*708*	*8 5*	*1924*	*2033*	*2 44*	2250	235		0043	0 26	0202	0232	0258	0324	0349	04 5	0444	*0517*	*0556*	*0642*
MOONSET	0359	04 9	044	0504	*053*	*0604*	*0643*	*0742*	*0831*	*0940*	*1054*	*1211*	*1329*	*1445*	*1602*	*1715*	*1832*	*1945*	*2054*	*2158*	*2254*
PHASE OF MOON						Full Moon							Last Qtr								

Moonrise and Moonset figures in *italic* indicate that moonrise and or moonset occur during daylight, i.e. between First Light and Last Light.

BEACH GRADIENTS SECTIONS SHOWN CORRESPOND TO GREEN SOLID AND BROKEN LINES ON REVERSE SIDE OF THIS SHEET IDENTIFIED BY LETTERS



CAUTION The vertical scale is *5 times* the horizontal scale HHW on each graph represents approximate highest possible high water LLW on each graph represents approximate lowest possible low water

CURRENTS

The currents in this region are complex and their detailed behavior little known. In general, they flow eastward along the shore as the tide rises, reach a maximum about half tide, become slack during high water stand and then reverse, flowing westward as the tide falls, again reaching a maximum at about half tide and becoming slack near the time of low water. Maximum currents are experienced during spring tides and minimum currents during neap tides. Maximum currents attain velocities of about 2.7 knots at a distance of five miles offshore and decrease as they approach the shore, becoming about 2.2 knots at a distance of one mile offshore. The currents slack and reverse directions somewhat sooner near the shore than to seaward. Closer inshore than one mile, the current directions become more confused as the depths decrease, but in general the velocities also decrease, and it is reasonable to assume that they become insignificant at the proposed grounding points. The following table of currents has been compiled from all the available information. The listed values have been estimated from measured values at other points along the coast, and so should be treated as estimates only. Strong and persistent winds may cause considerable departure from the average values shown in the table.

ESTIMATED INSHORE CURRENTS

Use with caution

[illegible]

Example of the Use of the Current Table

[illegible]

TIDAL STAGES

ALL TIMES SHOWN ARE M.S.T. (G.M.T. PLUS 2 HOURS)

The accompanying tidal curves show the height of the water at any time above the approximate level of lowest low water. Soundings are shown on the chart in plain brown figures (not circled) and they represent depths measured at lowest low water. To find the depth at these points at any time:

(1) Find the height of the tide in feet at the time in question, from the tidal curve.

(2) ADD the sounding figure to height of the tide. The sum gives the depth of water in feet at the time and place in question.

FOR EXAMPLE At 1000 on June 9th the height of tide is 13 ft. The sounding figure at the point we select is 15 ft., 15 ft. plus 13 ft. equals 28 ft. depth.

The circled brown figures in the water area between the high high and low low water marks represent points which are sometimes above water. These figures give the height of the beach in feet above the approximate level of lowest low water. To find the depth of water at any time over these points, proceed as follows:

(1) Find the height of the tide in feet at the time in question from the tidal curve.

(2) SUBTRACT the circled brown figure from the height of tide. The result is the depth of water in feet at the time and place in question. If the circled brown figure is greater than the height of the tide and cannot be subtracted, it means that the point will be above water at this time.

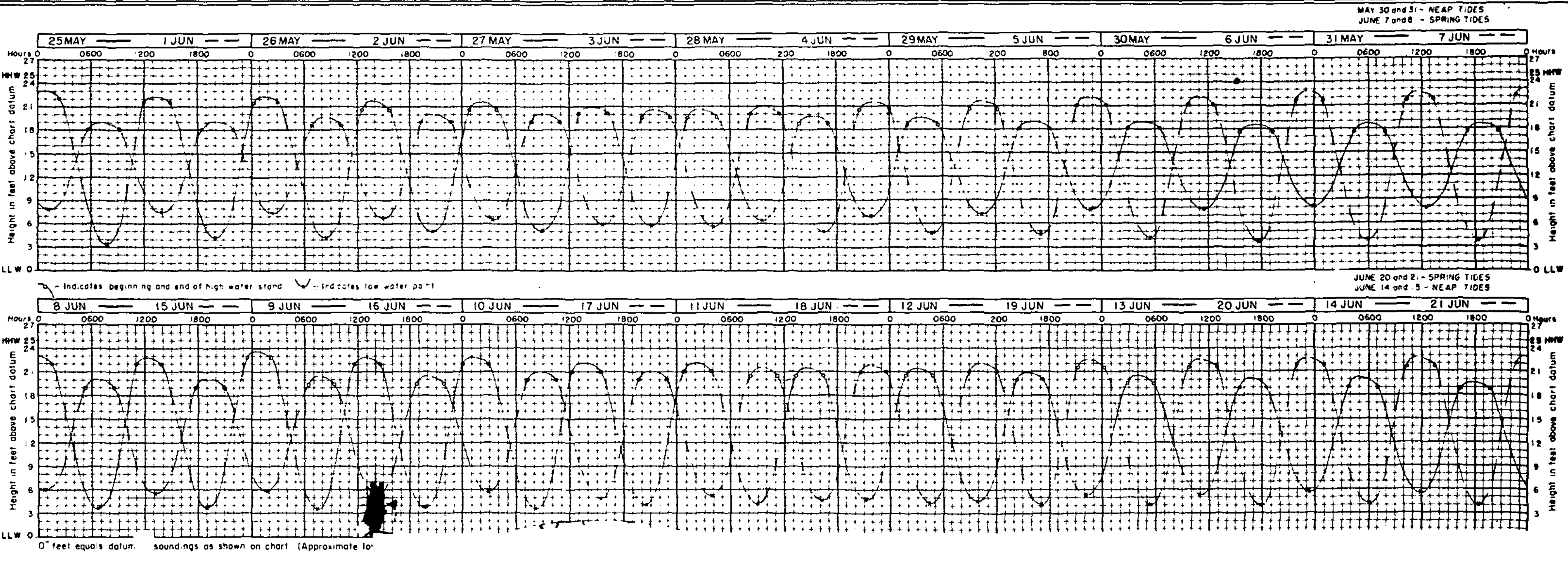
FOR EXAMPLE At 0130 on June 21st the height of tide is 20.5 ft. The beach height figure at the point we select is 9 ft., 20.5 ft. minus 9 ft. equals 11.5 depth.

The soundings on the high water fathom lines (figures in blue on chart) should *not be used to compute spot depths*. The high water fathom lines are shown on the chart merely to give an idea of the underwater beach contours between the high high water and low low water marks.

WARNING ON TIDAL, SOUNDING AND BEACH CONTOUR FIGURES

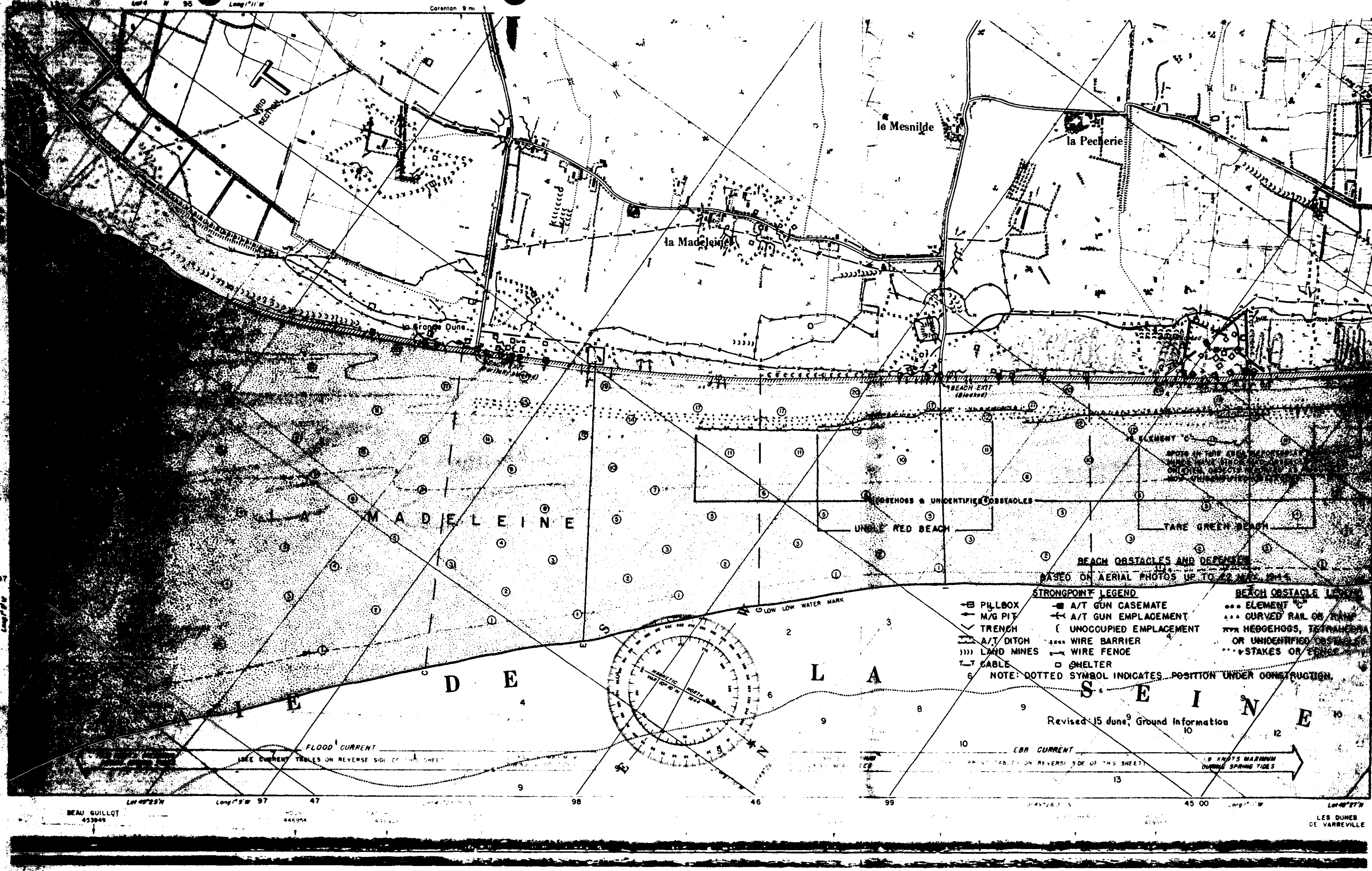
Any tidal, sounding and beach contour figures, even for familiar home waters, are only approximate. The combined influence of wind and atmospheric pressure alone may cause variations from the predicted heights of high water and low water, amounting to as much as 1 , feet. For enemy waters these figures are likely to be even more subject to error due to difficulties of obtaining recent accurate tidal and sounding information. Beach Gradients based on such sounding figures may also be subject to inaccuracies. Tides may form grooves and ridges in the sand parallel and perpendicular to the beach which will not show on navigation charts. THEREFORE, USE ALL TIDAL, SOUNDING AND BEACH CONTOUR FIGURES WITH EXTREME CAUTION. ALWAYS ALLOW A SUFFICIENT SAFETY FACTOR BY FIGURING THE WATER MAY BE A FEW FEET SHALLOWER THAN CALCULATED. WHEN NAVIGATING NEAR ROCKS OR SANDBARS ALLOW AN ADDITIONAL SAFETY FACTOR.

IMPORTANT: All soundings on chart and all readings on graphs are in FEET.



(56)

52



LEGEND

AREAS WITH NO SYMBOLS PRINTED OVER THEM ARE GENERALLY OPEN FIELDS

- SUPER HIGHWAY ---- 8 meters (26 ft.) or more wide
- PAVED ROAD ------ 6 to 8 meters (20-26 ft.) wide
- PAVED ROAD ------ 3 to 6 meters (10-20 ft.) wide
- SECONDARY ROAD - 3 to 6 meters wide, unpaved
- OTHER ROADS ---- 3 meters (10 ft.) max. width
- TRACKS & PATHS of Military significance
- RAILROAD (Number of lines indicates number of tracks)
- ELECTRIC RAILWAY or STREET CAR
- BUILDING — RUINS
- CHURCH — STONE WALL
- WINDMILL — CEMETERY
- LEVEE or DIKE — DEPRESSION or PIT
- SEAWALL — SPRING
- RIVER — DIRECTION of WATER FLOW
- STREAM-large — POND
- DRAINAGE DITCH-small or STREAM-small
- DRAINAGE DITCH-large or CANAL (with bridge)
- OVERFLOWED LAND
- TIDAL FLATS or MUD FLATS
- MARSH LAND
- TREES (Density of symbol indicates density of growth)
- ORCHARD
- HEDGES
- BUSHES
- GRASSY AREA
- SAND DUNES or SAND BARS
- SAND
- GRAVEL or SHINGLE
- CLIFFS (40°-90°)
- SLOPES (15°-40°)
- ROCKY CLIFFS or LEDGES

WARNING: USE ALL SOUNDINGS AND BEACH CONTOURS WITH CAUTION. (See note on reverse side.)

LOW WATER SOUNDINGS AND CONTOURS

——— LOW LOW WATER MARK

- 3 ft. line (½ fathom)
- 6 ft. line (1 fathom)
- 12 ft. line (2 fathoms)
- 18 ft. line (3 fathoms)
- 24 ft. line (4 fathoms)
- 36 ft. line (6 fathoms)

All sounding datum is reduced to approximate level of lowest possible low water. Brown figures are low low water soundings in feet. Circled brown figures indicate height of beach in feet above low low water.

HIGH WATER SOUNDINGS AND CONTOURS

——— HIGH HIGH WATER MARK

- 3 ft. line (½ fathom)
- 6 ft. line (1 fathom)
- 12 ft. line (2 fathoms)
- 18 ft. line (3 fathoms)
- 24 ft. line (4 fathoms)
- 36 ft. line (6 fathoms)

High water fathom lines are shown only between high high and low low water marks to serve as beach contours.

Panoramic shoreline sketch above shows beach as seen from water level height, approximately 2000 yards offshore, with sea at about 16 feet above low low water

NOTE to COXSWAIN or NAVIGATOR

Building landmarks, especially near the beach, may be destroyed before any craft land. Terrain features, therefore, are much more reliable for visual navigation from panoramic shoreline sketch above. Green solid and broken lines with letter at each end on chart above refer to Beach Gradients on reverse side of this sheet. Also on reverse side are Sunlight and Moonlight Table, data on Inshore Currents and Tidal Stages.

PREPARED BY COMMANDER TASK FORCE 122, APRIL 21, 1944

UTAH BEACH-SOUTH (La Madeleine)

Contours shown are at 10 meter (approx. 33 ft.) intervals above mean sea level, which is 13 ft. above low low water.

SCALE 1:10,000 (6.3" = 1 mile; 1" = 280 yds.)

Map from GSGS 4490, sheets 72, 73 & 74 and air photo examination. Grid square equals 1 kilometer (1000 meters).

METER SCALE 500 400 300 200 100 0 (1 METER = 3.3 FEET) 500 1000 METERS

YARD SCALE 500 400 300 200 100 0 500 1000 YARDS

GRID REFERENCE SCALE 0 1 2 3 4 5 6 7 8 9 10

This scale can be used to accurately measure tenths eastward or northwards in any grid square on the map

LONGITUDE SCALE 0" 10" 20" 30" 40" 50" 60"

LATITUDE SCALE 0" 10" 20" 30"

These scales can be used to accurately measure seconds of latitude or longitude using latitude and longitude squares on the map

~~8061~~

6066

[redacted] - [redacted]

UNTIL DEPARTURE FOR COMBAT OPERATIONS--
THEN THIS SHEET BECOMES RESTRICTED

57

SUNLIGHT AND MOONLIGHT TABLE

MAY 25 TO JUNE 21, 1944

ALL TIMES SHOWN ARE MST (GMT PLUS 2 HOURS)

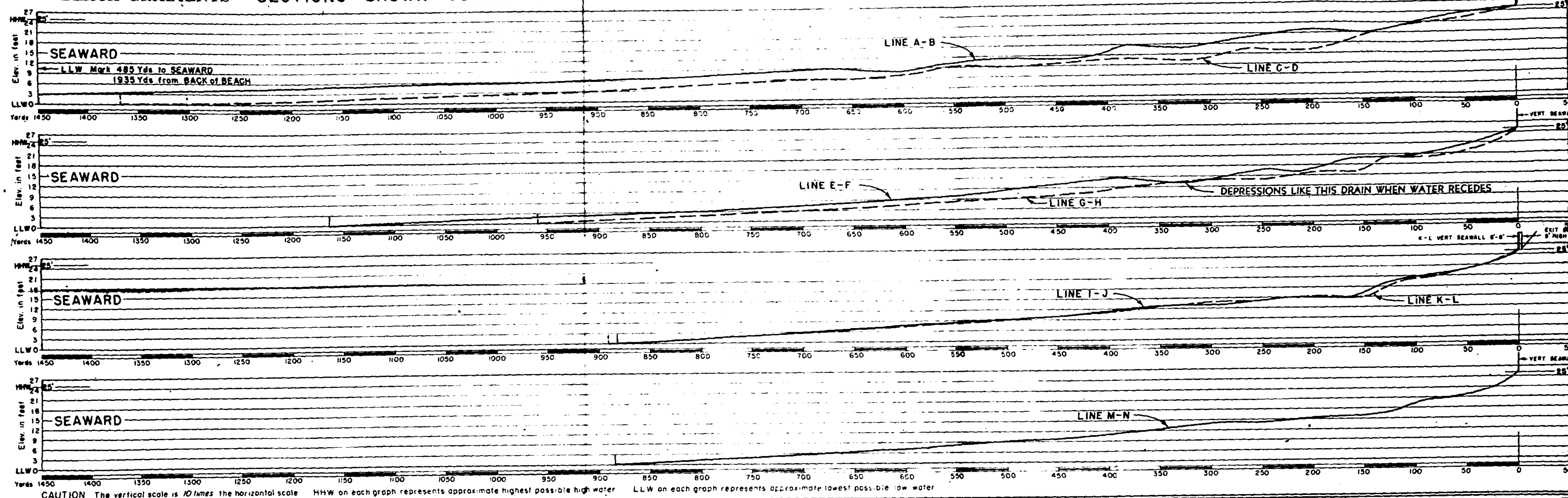
FIRST LIGHT and LAST LIGHT are here defined as the beginning and ending respectively of Civil Twilight (Sun 6° below the horizon).

DAY OF MONTH	MAY 25	26	27	28	29	30	31	JUNE 1	2	3	4	5	6	7	8
FIRST LIGHT	0528	0527	0526	0525	0524	0523	0522	0521	0520	0519	0518	0517	0516	0516	0516
SUNRISE	0608	0607	0606	0605	0604	0604	0603	0602	0601	0601	0600	0559	0558	0558	0558
SUNSET	2154	2155	2156	2157	2159	2200	2201	2202	2203	2204	2205	2206	2207	2208	2208
LAST LIGHT	2234	2235	2237	2238	2239	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250
MOONRISE	0853	0948	1048	1150	1252	1356	1459	1603	1708	1815	1924	2033	2144	2250	2351
MOONSET	0011	0102	0145	0220	0250	0315	0337	0359	0419	0441	0504	0531	0604	0643	0742
PHASE OF MOON						FIRST QTR							FULL MOON		

DAY OF MONTH	JUNE 9	10	11	12	13	14	15	16	17	18	19	20	21
FIRST LIGHT	0515	0514	0514	0514	0513	0513	0513	0512	0512	0512	0512	0512	0513
SUNRISE	0557	0557	0557	0557	0557	0557	0556	0556	0556	0557	0557	0557	0557
SUNSET	2209	2210	2210	2211	2211	2212	2212	2212	2213	2213	2214	2214	2214
LAST LIGHT	2251	2252	2253	2254	2255	2255	2256	2256	2256	2257	2257	2257	2258
MOONRISE		0043	0126	0202	0232	0258	0324	0349	0415	0444	0517	0556	0642
MOONSET	0831	0940	1054	1211	1329	1445	1602	1715	1832	1945	2054	2158	2254
PHASE OF MOON					LAST QTR								

Moonrise and Moonset figures in italic indicate that moonrise and/or moonset occur during daylight, i.e. between First Light and Last Light.

BEACH GRADIENTS SECTIONS SHOWN CORRESPOND TO GREEN SOLID AND BROKEN LINES ON REVERSE SIDE OF THIS SHEET IDENTIFIED BY LETTERS



CAUTION The vertical scale is *10 times* the horizontal scale HHW on each graph represents approximate highest possible high water LLW on each graph represents approximate lowest possible low water

CURRENTS

The currents in this region are complex and little known. In general, they flow SE or S as the tide rises, reach a maximum just before high water, become slack shortly after high water and then reverse, flowing NW as the tide falls, again reaching a maximum just before low water and becoming slack soon after low water. Maximum currents are experienced during spring tides and minimum currents, during neap tides. Maximum currents attain velocities of about 3.3 knots at a distance of five miles off shore and decrease as they approach the shore, becoming about 1.9 knots at a distance of one mile offshore. The currents slack and reverse direction somewhat sooner near the shore than to seaward. Closer inshore than one mile, the current directions become more confused as the depths decrease, but in general the velocities also decrease and it is reasonable to assume that they become insignificant at the proposed grounding points. The following table of currents has been computed from all the available information. The listed values have been estimated from measured values at other points along the coast and so should be treated as estimates only. Strong and persistent winds may cause considerable departure from the average values shown in the table.

ESTIMATED INSHORE CURRENTS

Use with caution

Time Referred to Time of High Water (see tide curves)	5 Miles Out Set	5 Miles Out Drift Kts During Spring Tides	5 Miles Out Drift Kts During Neap Tides	2½ Miles Out Set	2½ Miles Out Drift Kts During Spring Tides	2½ Miles Out Drift Kts During Neap Tides	1 Mile Out Set	1 Mile Out Drift Kts During Spring Tides	1 Mile Out Drift Kts During Neap Tides
6 hours before	NW	2.5	1.4	NW	0.9	0.5	NW	0.5	0.3
5 hours before	NW	1.8	1.0	Slack	0	0	SE	0.3	0.2
4 hours before	NW	0.9	0.5	S	0.8	0.5	SE	1.2	0.7
3 hours before	SE	0.3	0.2	S	1.7	1.0	SE	1.7	1.0
2 hours before	SE	2.6	1.5	S	2.3	1.3	SE	1.9	1.1
1 hour before	SE	3.3	1.9	S	2.1	1.2	SE	1.7	1.0
High Water	SE	1.4	0.8	S	0.8	0.5	Slack	0	0

Time Referred to Time of High Water (see tide curves)	5 Miles Out Set	5 Miles Out Drift Kts During Spring Tides	5 Miles Out Drift Kts During Neap Tides	2½ Miles Out Set	2½ Miles Out Drift Kts During Spring Tides	2½ Miles Out Drift Kts During Neap Tides	1 Mile Out Set	1 Mile Out Drift Kts During Spring Tides	1 Mile Out Drift Kts During Neap Tides
High Water	SE	1.4	0.8	S	0.8	0.5	Slack	0	0
1 hour after	SE	0.3	0.2	NW	0.5	0.3	NW	0.9	0.5
2 hours after	NW	0.6	0.3	NW	1.2	0.7	NW	1.5	0.9
3 hours after	NW	1.4	0.8	NW	1.8	1.0	NW	1.8	1.0
4 hours after	NW	2.4	1.4	NW	2.3	1.3	NW	1.9	1.1
5 hours after	NW	2.8	1.6	NW	2.1	1.2	NW	1.6	0.9
6 hours after	NW	2.7	1.5	NW	1.6	0.8	NW	0.9	0.5

Example of the Use of the Current Table

[illegible]

MAY 30 and 31 - NEAP TIDES
JUNE 7 and 8 - SPRING TIDES

TIDAL STAGES

ALL TIMES SHOWN ARE M.S.T. (G.M.T. PLUS 2 HOURS)

The accompanying tidal curves show the height of the water at any time above the approximate level of lowest low water. Soundings are shown on the chart in plain brown figures (not circled) and they represent depths measured at lowest low water. To find the depth at these points at any time:

(1) Find the height of the tide in feet at the time in question, from the tidal curve.

(2) ADD the sounding figure to height of the tide. The sum gives the depth of water in feet at the time and place in question.

FOR EXAMPLE: At 1135 on June 3rd the height of tide is 14.5 ft. The sounding figure at the point we select is 15 ft.; 15 ft. plus 14.5 ft. equals 29.5 ft. depth.

The circled brown figures in the water area between the high high and low low water marks represent points which are sometimes above water. These figures give the height of the beach in feet above the approximate level of lowest low water. To find the depth of water at any time over these points, proceed as follows:

(1) Find the height of the tide in feet at the time in question from the tidal curve.

(2) SUBTRACT the circled brown figure from the height of tide. The result is the depth of water in feet at the time and place in question. If the circled brown figure is greater than the height of the tide and cannot be subtracted, it means that the point will be above water at this time.

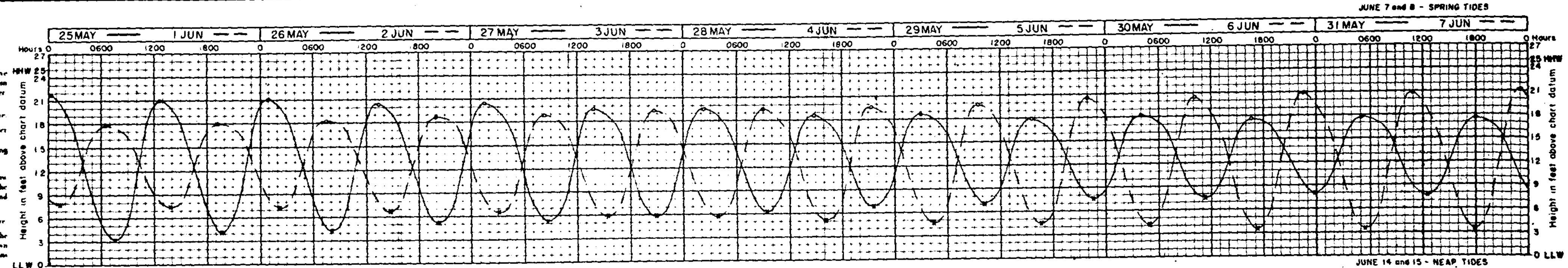
FOR EXAMPLE: At 1445 on June 11th the height of tide is 20 ft. The beach height figure at the point we select is 9 ft.; 20 ft. minus 9 ft. equals 11 ft. depth.

The soundings on the high water fathom lines (figures in blue on chart) should not be used to compute spot depths. The high water fathom lines are shown on the chart merely to give an idea of the underwater beach contours between the high high water and low low water marks.

WARNING ON TIDAL, SOUNDING AND BEACH CONTOUR FIGURES

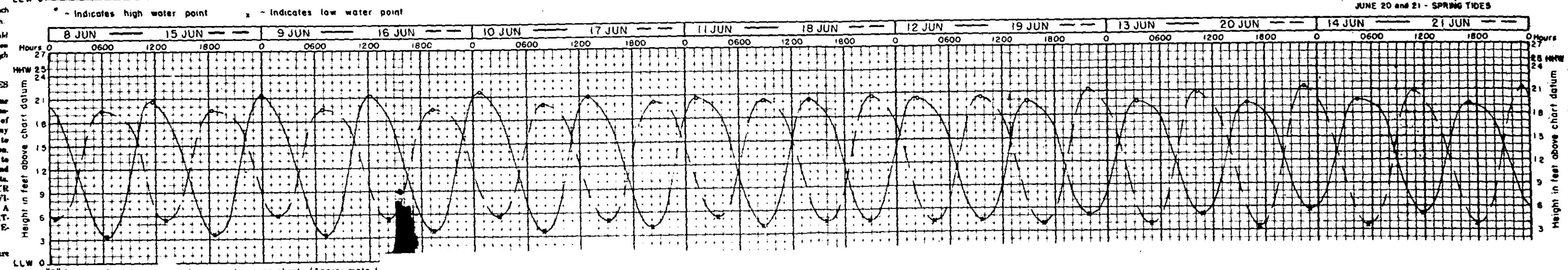
Any tidal, sounding and beach contour figures, even for familiar home waters, are only approximate. The combined influence of wind and atmospheric pressure alone may cause variations from the predicted heights of high water and low water, amounting to as much as 1½ feet. For enemy waters these figures are likely to be even more subject to error due to difficulties of obtaining recent accurate tidal and sounding information. Beach Gradients based on such sounding figures may also be subject to inaccuracies. Tides may form grooves and ridges in the sand parallel and perpendicular to the beach which will not show on navigation charts. THEREFORE, USE ALL TIDAL, SOUNDING AND BEACH CONTOUR FIGURES WITH EXTREME CAUTION. ALWAYS ALLOW A SUFFICIENT SAFETY FACTOR BY FIGURING THE WATER MAY BE A FEW FEET SHALLOWER THAN CALCULATED. WHEN NAVIGATING NEAR ROCKS OR SANDBARS ALLOW AN ADDITIONAL SAFETY FACTOR.

IMPORTANT: All soundings on chart and all readings on graphs are in FEET.



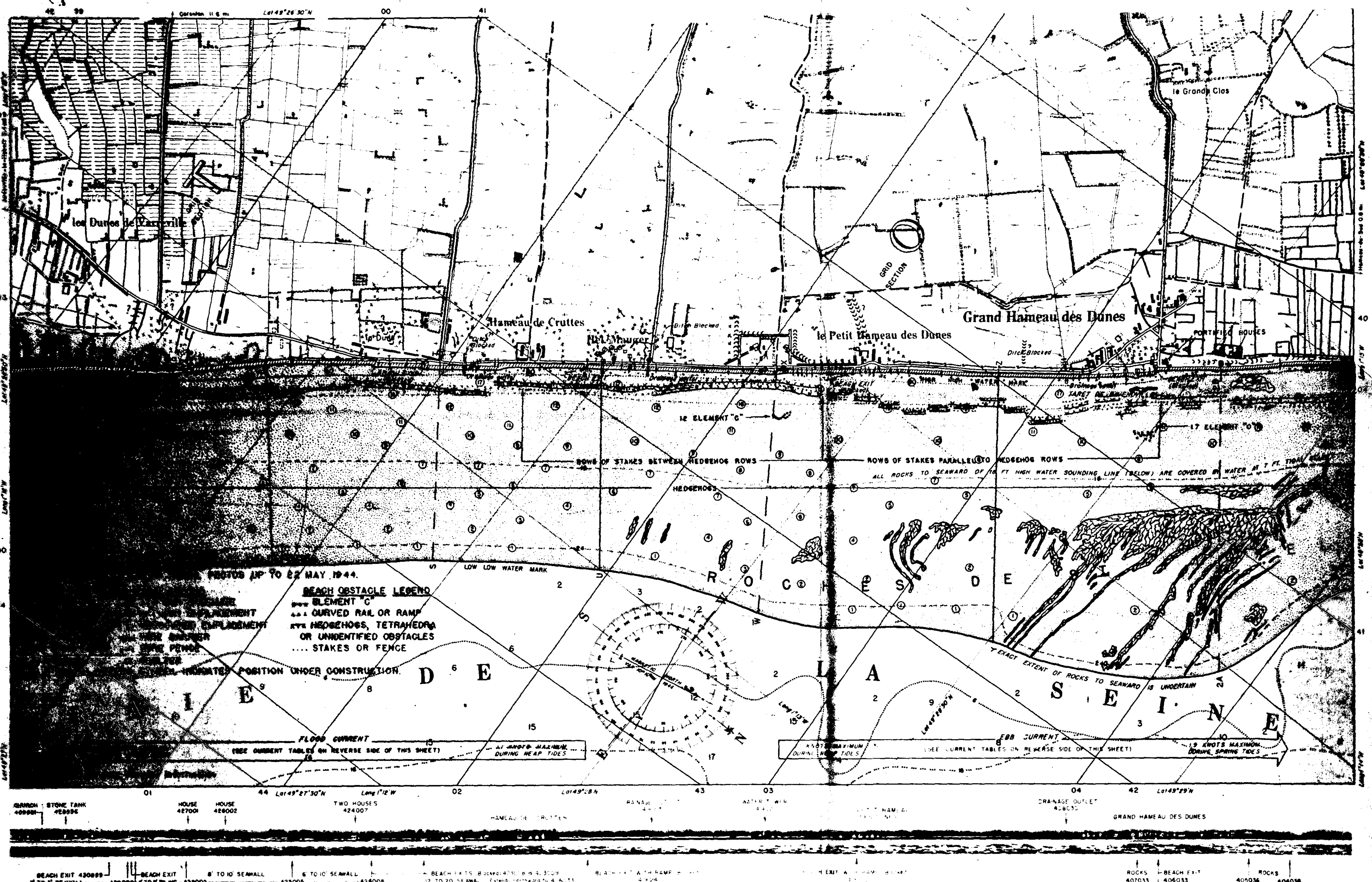
* - Indicates high water point x - Indicates low water point

JUNE 14 and 15 - NEAP TIDES
JUNE 20 and 21 - SPRING TIDES



"O" feet equals datum of soundings as shown on chart (Approximate l

(58)



LEGEND

AREAS WITH NO SYMBOLS PRINTED OVER THEM ARE GENERALLY OPEN FIELDS

- SUPER HIGHWAY - - - 8 meters (26 ft.) or more wide
- PAVED ROAD - - - - - 6 to 8 meters (20-26 ft.) wide
- PAVED ROAD - - - - - 3 to 6 meters (10-20 ft.) wide
- SECONDARY ROAD - 3 to 6 meters wide, unpaved
- OTHER ROADS - - - - 3 meters (10 ft.) max. width
- TRACKS & PATHS of Military significance
- RAILROAD (Number of lines indicates number of tracks)
- ELECTRIC RAILWAY or STREET CAR
- BUILDING — RUINS
- CHURCH — STONE WALL
- WATER TOWER — CEMETERY
- LEVEE or DIKE — DEPRESSION or PIT
- SEAWALL — SPRING
- RIVER — DIRECTION of WATER FLOW
- STREAM-Large — POND
- DRAINAGE DITCH-small or STREAM-small
- DRAINAGE DITCH-large or CANAL (with bridge)
- OVERFLOWED LAND
- TIDAL FLATS or MUD FLATS
- MARSH LAND
- TREES Density of symbol indicates density of growth
- ORCHARD
- HEDGES
- BUSHES
- GRASSY AREA
- SAND DUNES or SAND BARS SAND
- GRAVEL or SHINGLE
- CLIFFS (40°-90°)
- SLOPES (15°-40°)
- ROCKY CLIFFS or LEDGES

WARNING: USE ALL SOUNDINGS AND BEACH CONTOURS WITH CAUTION. (See note on reverse side.)

LOW WATER SOUNDINGS AND CONTOURS

LOW LOW WATER MARK

3 ft. line (½ fathom) ... 18 ft. line (3 fathoms)
6 ft. line (1 fathom) ... 24 ft. line (4 fathoms)
12 ft. line (2 fathoms) ... 36 ft. line (6 fathoms)

All sounding datum is reduced to approximate level of lowest possible low water. Brown figures are low low water soundings in feet. Circled brown figures indicate height of beach in feet above low low water.

HIGH WATER SOUNDINGS AND CONTOURS

HIGH HIGH WATER MARK

3 ft. line (½ fathom) ... 18 ft. line (3 fathoms)
6 ft. line (1 fathom) ... 24 ft. line (4 fathoms)
12 ft. line (2 fathoms) ... 36 ft. line (6 fathoms)

High water fathom lines are shown only between high high and low low water marks to serve as beach contours.

Panoramic shoreline sketch above shows beach as seen from water level height, approximately 2000 yards offshore, with sea at about 16 feet above low low water

NOTE to COXSWAIN or NAVIGATOR

Building landmarks, especially near the beach, may be destroyed before any craft land. Terrain features, therefore, are much more reliable for visual navigation from panoramic shoreline sketch above. Green solid and broken lines with letter at each end on chart above refer to Beach Gradients on reverse side of this sheet. Also on reverse side are Sunlight and Moonlight Table, data on Inshore Currents and Tidal Stages.

PREPARED BY COMMANDER TASK FORCE 122, APRIL 21, 1944

UTAH BEACH-NORTH (Ravenoville)

Contours shown are at 10 meter (approx. 33 ft.) intervals above mean sea level, which is 13 ft. above low low water.

SCALE 1:10,000 (6.3"=1 mile; 1"=280 yds.)

Map from GSGS 4490, sheets 72, 73 & 74 and air photo examination. Grid square equals 1 kilometer (1000 meters).

METER SCALE 500 400 300 200 100 0 1 METER = 3.3 FEET 500 1000 METERS

YARD SCALE 500 400 300 200 100 0 500 1000 YARDS

GRID REFERENCE SCALE 0 1 2 3 4 5 6 7 8 9 10

This scale can be used to accurately measure tenths eastward or northwards in any grid square on the map.

LONGITUDE SCALE 0" 10" 20" 30" 40" 50" 60"

LATITUDE SCALE 0" 10" 20" 30"

These scales can be used to accurately measure seconds of latitude or longitude using latitude and longitude squares on the map

6069

[redacted]

UNTIL DEPARTURE FOR COMBAT OPERATIONS-- THEN THIS SHEET BECOMES RESTRICTED

(59)

HYDROGRAPHY

The determination of the hydrographic details in the vicinity of the enemy shore during this operation presented a difficult and complex problem. Ranges of tide are over twenty feet; the detailed curves of the tide heights are complex and had not been well studied in the light of modern methods; tidal streams are swift and complicated; recent, reliable soundings, were in large measure lacking; the character of the beaches is such that their contours are subject to constant change under the influence of waves, currents, and beach obstacles.

The principal source of hydrographic information was the British Naval authorities. Regularly issued charts and standard hydrographic publications were obtained directly from the Hydrographic Office of the Admiralty; chart maps and other special studies were made available and distributed by the Allied Naval Commander Expeditionary Force. The various authorities concerned with hydrographic information used these data as basic information, supplementing it with more detailed study and interpretation as required for their particular problems, and issued charts, gradients, tables, etc., to their units in form most suitable for their uses. Continuous liaison was maintained between the authorities concerned with hydrographic data and there was a reciprocal exchange of information between them.

Aerial photography was the primary means of establishing the beach details. The "water line" method was the one which yielded the most important results on the beach contours between high and low water. In this method, the water's edge is determined from timed photographs and the level of this line determined by computing the tide level at the corresponding times. The "wave velocity method" was also employed, but was found to be of little value. This may have been due to the fact that few photographs of the area showing suitable wave patterns were available. In the "wave velocity method", photographs of the water under suitable wave conditions are used to determine the manner in which the distance between wave crests varies in shoaling water, and depths are determined by the known relationships between depth and wave length. Contours as determined by these methods were supplemented by photographic interpretation of exposed bars, lines of breakers, entrapped water in runnels, glare on water and sand, transparency of the water, etc.

Tidal information as normally prepared for navigational purposes was early seen to be insufficiently detailed for planning purposes. It was necessary to have predictions not only for time and height of high and low water, but also the tide level at any time, as accurately as possible. Owing to the complex nature of tidal curves in the Bay of the Seine and to the fact that all available data were based on French observations whose accuracy and modernity could not be readily established, the information used for planning had to be subjected to continuous study and modification. Predictions were

initially issued on the basis of tide machine results, harmonic constants having been estimated. Later investigation initiated by the Office of the Chief Engineer, European Theater, U.S. Army, made it necessary to change the initial predictions and it was not until D minus 30 that final predictions were made available.

As enemy activity is placing beach obstacles increased, certainty in predicting the position of the water line with respect to the obstacles became mandatory. A special photographic sortie was made to check the accuracy of this prediction. The result showed that it could be relied upon so long as no unusual meteorological influence obtained.

During the naval planning the chief problems depending on hydrographic factors were the following:

(a) Beach gradients at various stages of tide, particularly in relationship to the suitability of beaching and drying out various types of craft under various conditions of loading.

(b) Location of runnels and bars particularly with respect to their influence on beaching craft and on disembarking troops and vehicles.

(c) The position of the water line with respect to beach obstacles at various stages of tide.

(d) Soundings close inshore in respect to navigation of close fire support vessels and craft.

(e) Character of inshore currents and their effect on beaching and beached craft and on the construction as well as the permanence of artificial harbor installations.

(f) Estimation and prediction of meteorological influences on tide level.

CONCLUSIONS

(a) Beach gradients and contours were determined within acceptable limits of accuracy by the methods described in paragraph 3 above.

(b) Predictions of tide levels were accurate as verified by careful measurements taken by the beach hydrographic party.

(c) Hydrographic information for amphibious operations must be in much greater detail and accuracy than that required for usual navigational purposes.

WEATHER

Organization for weather forecasting and services during the operation followed in general the chain of command. The Chief Meteorological Officer, Supreme Headquarters Allied Expeditionary Force, as advisor to the Supreme Commander, took steps to minimize duplication and to coordinate activities between the three weather organizations principally involved: The Meteorological Services of the Royal Navy, the Air Ministry and the U.S. Army Air Forces. Technical studies and climatological estimates issued by the various units were centrally supervised by him. A conference of forecasters from these organizations was established; this conference, conducted by telephone under the supervision of the Chief Meteorological Officer, served to evolve coordinated short term and long term forecasts required for the operation. These coordinated forecasts were made available to the Western Task Force by Allied Naval Commander, Expeditionary Force whose meteorological officer took part in the conference.

In the Western Task Force, Staff Aerological Units were assigned to Naval Commander Western Task Force, and to Commander Assault Force "U". These units operated in the chain of command to furnish forecasts, ballistic air data and climatological information as required by their units.

The responsibility of providing facilities for synoptic observations from captured enemy ports, as they came under the control of U.S. port parties, was assigned to Naval Commander Western Task Force. Special observing personnel with equipment were assembled from the U.S., instructed, and assigned to Commander Captured Ports in order to meet this requirement.

The timing of the operation was planned to be dependent in part upon weather conditions. A weather situation giving likelihood of a quiet spell of at least four days commencing with D-day was to be sought. An ideal quiet spell was defined as a period during which onshore winds did not exceed force 3, offshore winds did not exceed force 4, and during which no major restrictions to aircraft operations occurred.

During the naval planning, the meteorological factors given particular attention were:

(a) The expected conditions immediately following the assault, particularly with respect to the likelihood of a quiet period.

(b) The expected conditions of wind and sea during the approach, particularly with respect to the effect upon smaller landing craft, heavy tows, etc.

(c) The expected wind and surf conditions on the assault beaches at H-hour.

(d) Conditions for laying smoke.

(e) Visibility, especially in its relationship to directing and spotting gunfire.

(f) Flying conditions, especially with respect to precision air bombardment and air spot of gunfire.

(g) Likelihood of strong onshore winds and dangerous surf.

D-day was initially set for 5 June on considerations of light and tide conditions. It was apparent from the synoptic situation on 3 June, that unfavorable weather conditions were developing, and, early on 4 June, orders for a postponement of twenty-four hours were broadcast by the Allied Naval Commander. By the evening of 4 June, much improved conditions were forecast for the morning of 6 June, although only a low order of confidence could be ascribed to the likelihood of moderate or quiet conditions for the following several days. Due to the tide and light conditions as well as other considerations of importance, the uncertainty of the weather conditions immediately following D-day was accepted, and at 2159 on 4 June, the Allied Naval Commander broadcast a confirmation of 6 June as D-day. These decisions were made by the Supreme Allied Commander who was advised by the meteorological organization described in paragraph 1 above. Naval Commander Western Task Force was kept informed of the developing weather situation by his staff aerological unit, independently.

During the approach, assault and immediate follow-up aerological units were established in USS AUGUSTA, Flagship of Naval Commander Western Task Force and in USS BAYFIELD, Flagship of Commander Assault Force "U". Ballistic winds and densities were broadcast to the Western Task Force before commencing the approach, when complete radio silence became effective. Summary of conditions met:

<u>During the approach</u>: Cloudy to partly cloudy sky, ceiling 2000 - 3000 feet, visibility 7 - 8 miles, wind West 15 - 20 knots, moderately choppy sea with 3 - 4 foot waves.

<u>Assault Area at H-Hour</u>: Cloudy, sky 9 tenths covered, ceiling above 10,000 feet with scattered clouds at 1200 feet, visibility 8 miles, wind West 15 knots with 3 - 4 foot waves and irregular surf inshore.

These conditions were essentially as forecast.

Moderate or quiet conditions continued during the twelve days following D-day, winds exceeding 18 knots in the unloading areas only briefly, with only slight effect on unloading operations. On the morning of 19 June (D plus 13), unforeseen strong Northeast winds developed as a result of steepened pressure gradient on the Southeastern edge of an extensive ridge of high pressure. Velocities at the surface increased from 8 knots to over 20 between 0400 B and 0800B. Onshore winds remained between 25 and 35 knots with gusts to 44 almost uninterruptedly until the morning of 22 June, a period of 72 hours. Breaking waves of 9 - 12 feet developed with wide spread damage and destruction to landing craft and the uncompleted harbor installations.

The following sources of radio weather information were used:

(a) Routine Admiralty weather broadcasts from Whitehall.

(b) Routine and special weather broadcasts from the Air Ministry.

Information included synoptic reports, upper air data, meteorological flight reports, analyses and forecasts. In order to copy sufficient radio weather traffic for complete forecasting service, it was necessary to employ a continuous watch of specially trained operators, manning one receiver at all times and two receivers about thirty per cent of the time.

When Naval Commander Western Task Force withdrew from the assault area at the conclusion of the assault and follow up phases of the operation, a complete forecasting unit was assigned to Flag Officer West who remained in charge of the build up. This unit was trained and equipped to make detailed forecasts of weather and sea conditions and to issue weather warnings.

It may be said that weather conditions during the approach, assault, and immediate follow up of the operation had the following notable effects on operations:

(a) It was necessary to postpone H-hour by about 24 hours in order to avoid a crossing in rough seas and fresh to strong winds. Among craft already underway when postponement was announced, some LCT's were swamped, capsized or otherwise damaged, so missing the assault.

(b) Even in moderate to fresh winds (15 - 20 knots) and moderately choppy sea, difficulty in crossing was experienced by some craft, notably LCT's, Rhino Tugs and Ferries. These difficulties in a few cases led to delays in arrival.

(c) With winds 15 - 18 knots and 3-4 foot waves, some DD Tanks were swamped and lost.

(d) With winds 15 - 18 knots offshore and alongshore, 3 - 4 foot waves and irregular surf, some of the smaller landing craft were broached and swamped inshore.

(e) Strong onshore winds (25 - 35) knots commencing D plus 13 and prolonged for 72 hours caused wide spread damage to landing craft and artificial harbor installations.

RECOMMENDATIONS

(a) An aerological unit trained and equipped to furnish the special forecasts peculiar to amphibious operations is essential. Such unit should be in the flagship of each commander who may be required to make decision to delay or postpone the landings.

(b) Forecasts of conditions effecting landing operations should be disseminated expeditiously to all ships concerned throughout the periods of assault and maintenance over beaches.

(c) The services of a qualified aerologist during the planning phase of a major amphibious operation are essential, in order to furnish necessary climatological research and to organize weather facilities prior to embarkation.

(d) The task of copying sufficient meteorological information for complete forecasting services under war time conditions requires a continuous watch of specially trained radio operators.

PRESS RELATIONS

The press relations of the Naval Western Task Force were handled by Commander U.S. Naval Forces in Europe. He assigned liaison officers to the Supreme Headquarters of the Allied Expeditionary Force which was charged with all Public Relations, including the accreditation of correspondents, for the operation. Directives for the conducting of public relations as well as detailed instructions as to the handling of press copy and film, status and assignment of correspondents, etc., were issued by SHAEF, and implemented by Annex A to our operation plan.

For the assault, fifty correspondents (accredited photographers but not official photographers included) representing 33 American news gathering organizations were assigned to 37 ships and craft of the Western Naval Task Force. Later 37 correspondents covered the naval activities on the Far Shore. In order to facilitate the gathering of news by the correspondents, and its transmission to London for censorship, 49 public relations officers, enlisted men and technicians were assigned.

All copy and film were sent back, by the most rapid means available, to the Ministry of Information, where SHAEF censors passed on and released copy. Most copy was sent back from the assault area via the official despatch boats, thence by despatch riders to London. Considering the distances involved, availability of boats, etc., the copy reached London in excellent time.

In order to provide an on-the-spot record, a number of Amertype Recordgraph Film Recording Units for the use of the four principal American Broadcasting Networks was used on four ships.

Arrangements were made for the transmission of copy via radio on the flagship of Force "O". A U.S. Navy censor, designated by SHAEF, was assigned to that ship for the security control of this transmission. However, this method of transmitting news was not used, as the Supreme Allied Commander did not give the necessary authorization.

In addition to the accredited photographers mentioned in paragraph 2 above, there were two Navy Combat Photo Units as well as 21 Coast Guard photographers and 13 Navy photographers (assigned to OSS) covering the operation.

The following represents the coverage given the operation:

(a) Between 6 June to 6 July there were 1819 press reports and feature articles concerning the Navy filed by correspondents. This totaled approximately 1,100,000 words of copy.

(b) During this period, 3415 still photographs and about 150,500 feet of motion picture film covering naval subjects were processed and prepared for release. Of the still pictures, 2,520 were obtained by U.S. Navy photographers and sent to the Navy Department for release.

CONCLUSIONS

(a) The press coverage for the operation was full and complete.

(b) The time consumed in forwarding and censoring copy, considering the distances involved, was very satisfactory.

RECOMMENDATIONS

(a) That permission be granted by the controlling authority for the Navy to transmit press copy in the clear, after having been censored on board, from designated ships.

CENSORSHIP AND SECURITY

Censorship was in accordance with U.S. Navy Censorship Regulations of 12 October 1943; as supplemented by instructions from ComNavEu and SHAEF. During the briefing period and until the operation began the sending of personal telegrams, cables or radiograms was not permitted, nor were personal telephone calls allowed. Personal mail was impounded during this period and was forwarded after the operation had started.

Security instructions issued through Force Commanders prior to briefing provided for complete security at all briefing points and prevented contacts between briefed and unbriefed personnel at ports, embarkation points and "hards", and on board all ships and craft. Arrangements were made for security supervision of briefed personnel taken ashore for hospitalization. Responsibility for preventing contacts between briefed and unbriefed personnel on board ships and craft rested with Commanding Officers, who detailed guards to supervise the necessary visits of unbriefed personnel such as were required for repairs, stores, etc.

CONCLUSIONS

Security and censorship measures adopted during the planning and briefing periods were effective. There is no indication that the enemy was informed of either the place or time of the Allied landing as a result of a leakage of information.

LOGISTICS

I. ORGANIZATION AND COMMAND RELATIONSHIP

Logistics planning and administration, because of the nature of the military command, departed in many respects from the normal U.S. practice. The operational planning being under the control of the British, the Allied Naval Commander prescribed British practices in many instances. Requests for certain aspects of logistic support were required to be made to the Allied Naval Commander. The British method of planning by committees was one of the major differences. The functions of many committees were not clearly defined, some committees overlapped, some continued to function after their usefulness had expired. Decision taken at meetings were recorded only in the minutes and frequently were too briefly expressed to provide an entirely satisfactory record of the basis for the action. The result was difficulty in maintain a satisfactory record and some uncertainty as to the authority of the commitments made.

The major logistic support for the Western Task Force was provided by Commander U.S. Naval Forces, Europe. His logistics organization centered in a section of his staff designated as the Task Force Support Section which had commenced logistics planning and procurement prior to the establishment of Commander Task Force ONE TWO TWO. Therefore, CTF 122 limited his logistics section to a small advisory group to cooperate and consult with the Task Force Support Section and to maintain liaison with the Allied Naval Commander.

About two months prior to the operation, Service Force ONE TWO TWO, was established by CTF 122 to assist in providing certain elements of logistic support.

The logistics support for the operation functioned satisfactorily and good cooperation existed between the logistics staffs of Commander U.S. Naval Forces, Europe, and CTF 122. In review, however, it is believed that the planning, procurement and administration of logistics matters would have been accomplished more effectively by the early establishment in the theater of a well-organized Service Force which had the specific task of supporting all operating Task Forces.

II. PLANNING, PREPARATION AND TRAINING

When the task force staff was assembled, a large part of the logistics organization was already in existence under the command of ComLanCrabEu and logistics planning had been commenced by ComNavEu. The task force logistics staff undertook to further the planning and to coordinate U.S. plans with those of the British and U.S. Army.

The logistics plan as finally evolved was very broad in scope; detailed planning remaining in the hands of the subordinate commands. The task force staff inescapably was involved in many details, however, due to the fact that detailed British planning was undertaken by the staff of ANCXF and the U.S. coordinating command was CTF 122.

In general, the procurement of necessary material was initiated by subordinate commands. In a number of instances, however, the material procurement had to be done under the control of the task force staff with the cooperation of the TFSS of ComNavEu.

Maintenance and repair of ships and craft and their preparation for the operation was performed wholly by ComLanCrabllthPhib, with only very general administrative supervision by CTF 122. On D-day 99½% of all ships and craft assigned to U.S. forces were available for the operation. This is considered to be a remarkable achievement in view of the large number involved and the fact that maintenance and repair had to be subordinated to training prior to the operation. It is a reflection of the thorough planning, scheduling and employment of repair forces under the command of ComLanCrab.

No specific logistics training program was issued. All of the supply services and maintenance organizations operated continuously and functioned in normal fashion during the training exercises.

III. [redacted] & [redacted]

The necessity for an artificial port arose out of the requirement to continue unloading over unprotected beaches for a sustained period after the assault. The design and construction of the various units were British responsibilities. The responsibility of CTF 122 included emplacing all units of the U.S. port under ANCXF direction and participating in such planning as had not been accomplished prior to the date when this command was constituted.

All units were successfully emplaced as they arrived off OMAHA Beach until 19 June, by which time the port was approximately 90% completed. The winds and seas of 19, 20, and 21 June resulted in the total elimination of [redacted] as a port of refuge. The destruction of the port was brought about in part by the direct action of the storm on the units forming the breakwater and in part by craft which when deprived of the shelter of the breakwater were washed against the piers within the port. The British [redacted], some miles to the eastward, suffered only minor damage, this due to a difference in the impact of the storm. The type of unit used was identical.

[redacted] One and [redacted] Two consisted of blockships sunk in line, so as to provide a shelter for small craft at anchor off both beaches. Both [redacted] were successfully completed according to plan. The storm of 19, 20 and 21 June caused most of the blockships to settle and broke the backs of some. The basic effectiveness of the [redacted] was lessened but not eliminated. By emplacing along the line of blockships certain units originally schedules for [redacted] it is expected that [redacted] Two will ultimately be restored to some effectiveness.

The desirability of an artificial harbor was obvious, plans for installation and the seamanship displayed in the installation were excellent. The ultimate failure possibly resulted from the dual effect of scouring of the sea bottom due to the tidal currents and to the dynamic action of the waves. It is possible that had the sunken concrete breakwater been designed with greater structural strength, it would have withstood summer storms. It is doubtful if any similar structure will withstand winter storms.

IV. SALVAGE AND FIRE-FIGHTING.

It was anticipated that great demands would exist for towing and fire-fighting on ships and craft during the passage and for salvage, towing and beach clearance during the assault phase of the operation. The problem involved two related but distinct activities:

(a) Heavy salvage and towing of large ships and craft principally in deep water; assistance in fighting fires on ships and craft off-shore.
(b) Salvage, repair and clearance from the beaches of damaged or stranded small craft.

These tasks were assigned to different organizations; the first to the Salvage and Fire-fighting Group (T.G. 122.3) operating as part of the Control Force, and the second to Craft Recovery Units operating under the beachmasters. The following report covers only the Salvage and Fire-fighting Group.

The assembly of personnel, craft and equipment was slower than desirable and organization and training was impeded somewhat by this condition. The final assembly of the personnel was not complete until about the middle of April and the assignment of salvage and rescue craft was not definite until a later date. Because of these conditions, it was not possible to exercise the group to the extent which was considered desirable, and the excellent work it rendered during the operation is a tribute to the resourcefulness of its personnel and a reflection of the prior experience of many of its members.

The necessity for large numbers of towing vessels in the operation prevented the assignment of the desired number of craft to the Combat Salvage and Fire-fighting Units which accompanied the assault forces. Fortunately, the need was less than expected and during the assault phase the salvage tasks were handled satisfactorily.

During the storm of June 19 to 21, the salvage groups were unable to undertake all the towing and salvage tasks which arose. Every available craft was pressed into service but the communications facilities were not capable of providing for the complete control of towing and salvage efforts during the emergency. Immediately after the storm seven additional tugs were assigned to the OMAHA Area by ANCXF and were employed in salvage duties.

V. SHIPS AND CRAFT.

There were several distinctly new major modifications of normal types of ship and craft developed for this operation which will be described as a matter of record. Also some standard craft were put to new uses for the first time. The following list does not cover any special devices or the new types of pontoon structures which are described elsewhere in this report.

1. Accommodation Ships

Five Liberty ships which had been fitted for the transport of prisoners of war were assigned to the Western Task Force and employed for the berthing and feeding of a portion of the rhino ferry and small boat crews. These ships also formed sources of supply for various smaller craft.

2. LST "Train Ferries".

The Army requirements for the transport of large amounts of railway rolling stock exceeded the available supply of standard train ferries. A number of LST's were fitted with three parallel lines of simple tracks constructed of flat bar welded intermittently to the tank deck. Additional fittings for securing the railway cars during the passage were installed as necessary. In order to provide a lesser grade at the threshold of the tank deck to permit the loading of railway cars, the normal incline leading to the flat deck was covered with reinforced concrete as a rapid construction method.

It had been planned to load these LST's at specially designated loading hards, employing auxiliary ramps for bridging the gap between the hard and the LST ramp.

The permanent LST installation did not interfere with the normal loading of vehicles although some minor damage to the tracks was encountered due to tracked vehicles.

3. Fighter Direction Tender

To provide fighter control in the assault area during the period before the establishment of suitable control centers ashore three British LST's were modified to act as fighter direction tenders.

The bow doors were secured. The tank deck was bulkheaded to provide office space and rooms for installation of radio, radar and auxiliary equipment. The necessary aerial equipment was installed to afford minimum interference with ship's structure. Topside structure was removed to minimize inteference.

The radio and radar masts made the ships distinctive targets and the lack of armament added to their vulnerability. However, the ships were well-adapted to the purpose intended and functioned satisfactorily.

4. DD Tank Launching

The development of the "DD" tank (amphibious Sherman tanks) created the problem of launching them from suitable craft at some distance from the beach. Early experiments were conducted by the British using LST's for the purpose. It was considered preferable, however, to disperse the tanks by the use of smaller craft and experiments were made first with an LCT(3) and later with LCT(6)'s. The latter were employed during the operation.

The problem necessitated the adoption of a suitable extension to the craft ramp to provide satisfactory depth of water for launching the tanks and a rig for supporting the ramp during the launching operation. Two types of ramps and supporting gear were developed; one was designed and installed in the U.K.; the other designed by BuShips and installed during construction. Both types were employed in the Western Task Force and the tanks were launched from the LCT's in the rough water which prevailed at the time. The launching per se was successful but a number of the tanks were swamped during passage to the beach and others put out of action by mines or obstacles.

5. LCT(A)

A number of LCT(5)'s were modified to permit two Sherman tanks to fire over the ramp during the passage to the beach in the assault. The modifications consisted of the installation of STS to protect vulnerable portions of the craft,

fuel tanks, engine rooms, ramp winch rooms, crew space and pilot house. An elevated platform was constructed in the forward portion of the tank deck to elevate the firing tanks. The platform was ramped fore and aft to permit loading and discharge of tanks.

The 75 tons added weight and distribution of the armor created an excessive trim by the stern. The carrying capacity of the modified craft was limited by these factors to the transport of three Sherman tanks; two on the elevated platform and one non-firing tank immediately abaft the forward pair.

"Mulock" Ramp Extension - A great many of the types of vehicles employed in the operation were classified as "awkward vehicles" by reason of the interference to loading and unloading which were inherent in the design of the vehicles. In order to afford rapidity in unloading it was necessary to decrease the angle between the craft ramp and the beach and to eliminate the high "drop-off" which was particularly present with LCT(5) ramps on flat beaches.

A number of the experiments resulted in the adoption of a ramp extension designed by Lieutenant Commander Mulock, RNVR. The extension's major feature was its attachment to the ramp by hinges which permitted the extension to be rotated out of the field of vision and which facilitated removal of the extension. All LCT's engaged in the operation were fitted with these extensions.

6. Salvage LCM(3)'s

It was anticipated that with the flat beaches, tidal currents and large range of tide the number of broached and damaged landing craft would be greater than usual. To cope with this situation it was necessary to have a shallow draft craft with good pulling power which could assist craft in trouble on the beaches and minimize the losses due to broaching.

Eighteen specially fitted LCM(3)'s were assigned to each assault forces to act as "CRAFT RECOVERY UNITS". Each recovery unit consisted of three LCM(3)'s. All of the craft were equipped with fire pumps, special towing bitts and towing gear. Two of each three carried bull-dozers to assist in retracting stranded craft. The personnel were specially selected and trained to act as beach salvage units and were equipped to make salvage repairs.

These craft performed very useful service both in the early assault phase of the operation and during the storm of 19-21 June.

7. 1000 Ton Barges

In order to have an emergency supply of ammunition available on the beaches it had been planned to load 20 barges of 1000 ton capacity and bring them to the assault area. Only 16 such barges were actually loaded and towed to the area. They were beached at high tide and allowed to dry out. They were unloaded by trucks alongside when dry. During the storm this reserve supply of ammunition proved very necessary.

If sufficient tugs had been available these barges could have been brought back to the United Kingdom for a second load.

The barges were car floats or barges of a similar type. They were towed across the Atlantic and all but one survived a bad storm. Fully loaded they towed well in moderately rough English Channel weather. They fulfilled their mission and in addition, when it was found that tugs were not available to tow them away, found temporary use as barges for unloading MT ships after the storm.

8. LSD

In addition to its standard use of bringing small craft to the operation HMS OCEANWAY was of great value in transporting damaged craft to United Kingdom repair bases. On one trip she carried 17 damaged LCM(3)'s from OMAHA Beach to Plymouth, England.

9. LST

Considerable doubt was expressed as to the advisability of allowing LST to dry out on the beaches. This method was successfully tested on the 2nd and 3rd tides, and as the operation progressed it was used extensively as the better method of unloading. No adverse effects appeared when due care was used in selecting and surveying the sites.

10. LCI(L)

These were found useful as Ferry Control and local headquarters ships.

11. LBE

Did a good job of repairing and maintaining British built craft such as LBV, LCT(4), LCT, etc.

12. LBO and LBW.

Fulfilled their mission of keeping a supply of fuel and water available for the use of craft unable to fuel at ships in the shuttle service.

13. LCP(L).

Were used with smoke pots to form a screen for the anchorage area. As smoke was hardly used these boats were used for local dispatch and traffic control. The gasoline engines of those assigned to U.S. forces proved not as dependable as the Diesel engines in all the other U.S. craft.

14. LCS(S)

After fulfilling their original mission in the assault these craft were useful performing the same functions as the LCP(L).

15. LCVP

After the assault the LCVP remaining in the area and later those which returned did yeoman's service as taxis and general utility boats. Having no deck forward or alongside, they are slightly difficult to get aboard or off of in rough weather.

16. LCC

These craft did not function as originally intended. In rough weather the boats are very wet and uncomfortable. It is impossible to work in the control room. They were used as scout boats during the assault rather than as navigational leaders. The generating equipment is inadequate to supply all the instruments.

VI. REPAIR, MAINTENANCE AND ALTERATION

The work of repair, maintenance and alteration in this operation involved a number of new problems:

(a) The work was done in a densely populated foreign country. The U.S. bases had to be placed in such locations as were made available. While generally satisfactory these bases had only minor docking facilities and no equipment to handle heavy material. Major repairs had to be done in British Naval or private dockyards which involved all the difficulties of foreign methods.

(b) The hugh numbers and the great variety of ships and craft made the maintenance problems complex. All during the preparation stage all U.S. bases were engaged in an extensive alteration program as well as getting all craft ready for the operation. A total of 2493 ships and craft were scheduled to take part; of these only 13 were unable to sail on schedule. An operating efficiency of 99½%.

(c) U.S. built and manned craft were operating with the British forces; British built craft, manned in some instances by British personnel and in others by U.S. personnel, were operating with the U.S. forces. It was decided as a general policy that each nationality should maintain the craft manned by it. This necessitated setting up a repair base on the Thames in the British zone. It also required the inclusion of a repair party on board the U.S. accommodation ship sent to the British beaches for the use of U.S. personnel operating there. At the same time the British repair parties in LBE were off the U.S. beaches for repairing British Craft.

(d) During the training and preparation period the U.S. bases were on the flanks of the operation. The ports to and from which the shuttle service was to operate were near the center of the south coast. This necessitated the transfer of maintenance facilities within the U.K. just at the time the operation was getting under way. At the same time the far shore repair organization had to be assembled and loaded. This transfer of personnel and equipment at such a critical time was done smoothly.

1. Near Shore

To ensure the best use of all repair facilities, the British established the COREP (Coordination or Repair) organization. At first the central COREP, in order to save towage, built up a congestion in the Portsmouth-Portland area. This was soon rectified and all U.S. bases were kept at full capacity. The U.S. forces did not need this organization to help them except in the few cases where dockyard repairs were required.

2. Craft Recovery Units in LCM(3) arrived on D-day. As beach conditions warranted, augmented E-9 Units landed and 2 ARL's anchored off the U.S. beaches. All major ships remaining in the area not only repaired their own boats but rendered assistance to many others. A 475-ton

NL pontoon dry dock, although damaged in the storm, continued to perform useful service. These integrated far shore repair organizations did excellent service in keeping ferry craft in operation and in clearing the great damage caused by the storm.

VII. SPARE PARTS AND REPAIR MATERIAL FOR LANDING SHIPS AND CRAFT.

Machinery spares were covered by automatic flow of the necessary spares from the U.S. The early automatic flow of materials was greatly delayed due to the greater need for the materials in more active areas. These deficiencies were made up prior to D-day and sufficient spares were on hand to place all ships and craft in operation for the assault and to maintain the craft after the assault.

It was expected that large quantities of hull spares and repair material would be needed to repair battle damage. The problem of procuring this material was complicated to some extent by the presence of large numbers of U.S. built craft manned and operated by the British. The total of the separate demands by U.S. and British forces exceeded the supply of material which was available. As a result the entire problem was studied by the U.S. and British commands and a joint request was submitted.

The available materials were shipped to the U.S. forces and distributed by them between U.S. and British forces on the basis of the number of craft of each type which were manned by the respective forces. As a corrallary to this decision, it was agreed that each nation would maintain the craft manned by it, regardless of which force had operational control.

The great problem of handling and transporting the great quantity of spare parts and after action material from Exeter to both the U.S. and British bases and loading points was handled expeditiously and smoothly.

No cases have been reported to this command which indicate that a lack of machinery or hull spares in any way have jeopardized the operation.

VIII. LOSSES AND DAMAGE INCURRED.

Table 1 gives the most complete record which can be compiled of losses and damages to ships and craft of LCT size and larger. This table does not follow the record exactly as received but has been edited by personnel familiar with the operation in order to present a clearer and more accurate picture.

During the early part of the operation, and during the storm of D + 13, to D + 15, it was difficult to assemble accurate records of damage and loss. This is attributable in part to the demands of more important duties than the collection of statistics and in part to the difficulties of communication. Therefore, the data can be considered not more than a close approximation. More complete and accurate data must await the compilation of detailed reports from subordinate commands.

In general, the number of ships and craft lost and damaged was much smaller than anticipated.

Damage caused by broaching.	12%
Damage caused by gunfire	3%
Damage caused by torpedo	1%
Damage caused by mines	18%
Damage caused by bombs	1%
Damage caused by grounding or collision	6%
Damage caused by unknown or other causes	56%

	Broached	Gunfire	Torpedo	Mines	Bombs	Grounding/ Collision	Unknown or Other cause	Total
D-day				1 DD				1 DD
				1 PC				1 PC
				1 AM				1 AM
							1 Danlayer	1 Danlayer
	1 LST						1 LST	2 LST
	4 LCI(L)			1 LCI(L)			1 LCI(L)	6 LCI(L)
	4 LCT(4)			1 LCT(4)				5 LCT(4)
	7 LCT(5)			2 LCT(5)			2 LCT(5)	11 LCT(5)
	8 LCT(6(	1 LCT(6)		4 LCT(6)			3 LCT(6)	16 LCT(6)
						1 LCT(A)	1 LCT(A)	2 LCT(A)
							1 LCC	1 LCC
Total	24	1		11		1	10	47
D+1		1 DD				1 DD		2 DD
							1 PT	1 PT
				1 AM				1 AM
				1 LCI(L)			2 LCI(L)	3 LCI(L)
				2 LCT(5)			2 LCT(5)	4 LCT(5)
							6 LCT(6)	6 LCT(6)
Total		1		4		1	11	17

	Broached	Gunfire	Torpedo	Mines	Bombs	Grounding or Collision	Unknown or Other Causes	Total
D+2				2 DD				2 DD
				1 DE				1 DE
				1 YMS				1 YMS
				1 LST				1 LST
	1 LCT(5)						1 LCT(5)	2 LCT(5)
				1 LCT(6)				1 LCT(6)
							3 LCT(A)	3 LCT(A)
Total	1			6			4	11
D+3				1 Trawler				1 Trawler
						1 MS	1 MS	2 MS
			1 LST				1 LST	2 LST
			1 LCT(4)					1 LCT(4)
							2 LCT(5)	2 LCT(5)
							1 LCT(6)	1 LCT(6)
Total			2	1		1	5	9
D+4							1 LST	1 LST
	1 LCI(L)					2 LCI(L)	2 LCI(L)	5 LCI(L)
				1 LCT(5)			6 LCT(5)	7 LCT(5)
							1 LCT(6)	1 LCT(6)
							3 LCT(A)	3 LCT(A)
Total	1			1		2	13	17

	Broached	Gunfire	Torpedo	Mines	Bombs	Grounding or Collision	Unknown or Other Causes	Total
D/5			1 LST	1 LST		1 LST		3 LST
					1 LCI(L)			1 LCI(L)
Total			1	1	1	1		4
D/6			1 DD					1 DD
							1 LCI(L)	1 LCI(L)
Total			1				1	2
D/7				1 MMS				1 MMS
							1 LST	1 LST
				1 LCT(4)				1 LCT(4)
							1 LCT(5)	1 LCT(5)
Total				2			2	4
D/8				1 AP				1 AP
				1 MT				1 MT
				1 LCT(5)				1 LCT(5)
				1 LCT(A)				1 LCT(A)
Total				4				4
D/9				1 LST	1 LST			2 LST
					1 LCT(5)			1 LCT(5)
Total				1	2			3
D/10							1 DD	1 DD
Total							1	1

	Broached	Gunfire	Torpedo	Mines	Bombs	Grounding or Collision	Unknown or Other Cause	Total
D/11				1 YMS				1 YMS
				1 LSI(L)				1 LSI(L)
				1 MMS				1 MMS
						3 LST		3 LST
Total				3		3		6
D/12	-	-	-	-	-	-	-	-
D/13							1 BM	1 BM
							1 ML	1 ML
							1 LST	1 LST
							3 LCI(L)	3 LCI(L)
							2 LCT(3)	2 LCT(3)
							4 LCT(4)	4 LCT(4)
							5 LCT(5)	5 LCT(5)
							3 LCT(6)	3 LCT(6)
							1 LCT(A)	1 LCT(A)
							1 LCF	1 LCF
Total							22	22

	Broached	Gunfire	Torpedo	Mines	Bombs	Grounding or Collision	Unknown or Other Cause	Total
D/14				1 Fr. DD				1 Fr. DD
						1 PC		1 PC
						1 LSI(H)		1 LSI(H)
						1 LCI(L)	3 LCI(L)	4 LCI(L)
							3 LCT(3)	3 LCT(3)
	2 LCT(4)			1 LCT(4)			3 LCT(4)	6 LCT(4)
							6 LCT(5)	6 LCT(5)
							4 LCT(6)	4 LCT(6)
							2 LCT(A)	2 LCT(A)
							2 LCF	2 LCF
Total	2			2		3	23	30

	Broached	Gunfire	Torpedo	Mines	Bombs	Grounding or Collision	Unknown or Other Cause	Total
D/15							1 DD	1 DD
							1 SC	1 SC
				1 AT				1 AT
							1 HM Tug	1 HM Tug
							4 LST	4 LST
							5 LCI(L)	5 LCI(L)
							2 LCT(3)	2 LCT(3)
	1 LCT(4)						4 LCT(4)	5 LCT(4)
							5 LCT(5)	5 LCT(5)
							4 LCT(6)	4 LCT(6)
							1 LCT(A)	1 LCT(A)
							1 LCF	1 LCF
Total	1			1			29	31
D/16				1 DD		1 PT		1 DD 1 PT
							1 HM Tug	1 HM Tug
							1 ATR-2	1 ATR-2
							1 LCI(L)	1 LCI(L)
							1 LCT(4)	1 LCT(4)
Total				1		1	4	6
								1 LCT(A)
D/17	1 LCT(A)						3 SC	3 SC
Total	1						3	4

	Broached	Gunfire	Torpedo	Mines	Bombs	Grounding or Collision	Unknown or Other cause	Total
D/18							1 SC	1 SC
Total							1	1
D/19		1 BB						1 BB
		1 CL						1 CL
		3 DD						3 DD
Total		5						5
D/20						1 PT		1 PT
							1 LCT(6)	1 LCT(6)
Total						1	1	2
D/21							1 LST	1 LST
Total							1	1
D/22						1 LST		1 LST
Total						1		1
D/23				1 PC				1 PC
				4 MT				4 MT
				1 BYMS				1 BYMS
Total				6				6
D/24	-	-	-	-	-	-	-	-
D/25	-	-	-	-	-	-	-	-
Grand Total	30	7	4	44	3	15	131	234

IX. N.L. PONTOON EQUIPMENT.

The major items of N.L. pontoon equipment used were:

(a) Drydocks.
(b) Causeways.
(c) Rhino Ferries and Attendant craft.
(d) Warping Tugs.

1. Dry Docks

ComLanCrabllthPhib assembled some 250-ton and 100-ton docks for the U.S. Army to be used by the Army in captured ports. Four 475-ton drydocks assembled by the British were to be made available to the U.S. Navy. Because of all available towage having been diverted to the use of Mulberries, only one of these docks was delivered by D-day. It was towed over to OMAHA Beach, arriving D + 11 and used in conjunction with the ARL-4 until the storm of 19 June. It was damaged in that storm but was partially repaired and continued in use in repairing storm damage. The remaining 3 docks are still to be delivered.

2. Causeways

Intelligence reports had indicated that some of the beaches were on a peat foundation and that they might therefore be muddy. To give a hard beach roadway on which to unload vehicles, it was decided to use NL pontoon causeways sunk in place. Two causeways, each consisting of 14 2x30 sections, were to be laid on each beach. Unloading experiments showed the causeways should be augmented by adding "blisters" on 4x12 sections as unloading stations on each side at intervals. On UTAH Beach, the causeways were placed as planned. On OMAHA the causeways were made shorter and of double width. On both beaches they proved extremely useful. They were not essential for unloading vehicles as the sand on the beaches turned out to be firm, but vehicles did use them. For personnel they were of great use, enabling them to land dry-shod instead of walking at least waist deep in water as they had to do before the causeways were laid. After the storm those laid inside the [redacted] were undamaged, whereas those exposed to the full force of the storm suffered from scouring and were tilted out of place.

There was difficulty in keeping craft from fouling the causeway; occasionally craft were carried across one by the current and dried out, completely blocking the causeway for a tide. No fixed marker for the causeway end was found to last as they were carried away by landing craft.

A satisfactory marker was finally made by using a barrage balloon with colored pennants on its anchor cable.

3. Rhino Ferries

Because of the flatness of the beaches it was not thought possible except near high tide for LST to unload vehicles directly without drying out. To ferry vehicles from LST to the beach 6x30 NL pontoon barges with propulsion units and ramps were employed. A total of 75 of these rhino ferries were assembled in the U.K. They were assembled, 38 by the British and 37 by the Sea Bees at USAABS. 39 were assigned to the British Task Force, 31 were assigned to the U.S. Force and 5 were held in reserve, being assigned to the U.S. force after the storm.

The rhinos were married to LST as planned in seas up to 3 feet. After D / 3 most of LST unloaded directly to the beach. The rhinos then were used with great success in unloading MT ships. Their big capacity and stable platform made them very useful as ferry craft. Loads varied from 75 Jeeps to 17 Mk. IV tanks.

In the currents and winds off the Normandy beaches the most noticeable fault of the rhinos was that they were underpowered. A great deal of time was spent in making slow progress from beach to ship and back. This meant that the power plant was run at overload and therefore needed repairs more than expected. Bigger and more rugged power plants are needed for these big barges. The inboard propulsion units are not good on barges and tugs which have to beach.

With the rhinos were sent one 6x24 repair barge to each beach. These proved highly successful as repair bases and as a haven and mother ship to the small NL tugs.

The rhinos broached and were damaged in the storm as much as any craft, but because of their compartmentation they were more easily salvageable.

4. This new use of NL pontoon gear promised to be very helpful for placing causeways and for beach recovery and salvage. They arrived in the U.K. so late that no time was available for training in the special technique of this use. Because of the difficulty of maneuverability of these craft they were of less use than had been anticipated. In the congestion on and off the beaches the anchor line was an interference. They did prove extremely useful as moorings during the storm period.

ANNEX C - LOGISTICS

5. All of these pontoon structures towed well in rough weather and in convoy. The docks, rhinos, tugs and repair barges were towed with a bridle, the causeways sections with a single line. In some cases rhinos were under tow by LST for 58 hours. They reduced the speed of LST by two to three knots.

X. PERSONNEL

The number of naval personnel in the Western Naval Task Force, shore based and afloat, reached the peak figure of 125,000. The number of man-jobs, however, was considerably larger. This was accomplished by phasing personnel, so that the same individuals performed successive duties as the schedule of preparation and operations developed. Phasing was materially assisted by the same short geographical distances which made this operation unique in so many other respects. It was limited by inadequate time for the specialized training required for many of the undertakings involved.

The responsibility of administering and phasing personnel was delegated by CTF 122 to ComSerFor 122. It was his obligation in the first instance to attempt to fill all requirements from personnel already assigned to units of TF 122. When this could not be accomplished, a request for the requisite additional personnel was made to ComNavEu. If such request was approved, it was filled by personnel available to ComNavEu in the U.K. if possible; otherwise it was forwarded to the U.S. for action. By this double screening process, requests upon the Navy Department for additional personnel were restricted to a minimum.

During the operation, records of all personnel involved were kept by ComSerFor 122. All information on casualties, transfers, and other pertinent matters concerning personnel was maintained and analyzed by him at one central office in Plymouth, England.

XI. FUEL, LUBRICANTS AND WATER

The plans for the supply of fuels, lubricants and water were prepared principally by ComNavEu with the cooperation of the task force staff.

Despite expected minor difficulties and in face of certain changes in operations which prevented replenishments of fuel and water as planned, there was at no time any threat to operations because of a lack of supply.

ANNEX C - LOGISTICS

XII. PROVISIONS AND SUBSISTENCE.

The provisions furnished to ships and craft were in accordance with the plan. The type of ration served is considered to have been generally satisfactory in view of the circumstances surrounding such an operation.

Certain additional equipment was provided for small landing craft to augment the existing cooking facilities in order that the food available could be prepared and served in the most palatable manner. LBKs were provided with vacuum food containers and other articles to facilitate the distribution of prepared meals to the craft served.

It was agreed with British authorities that the responsibility for supplying provisions to vessels and craft, whether British or American, would be in accordance with the following plan: U.S. authorities would be responsible for supplying all vessels at American Hards and Piers and British authorities would assume responsibility for supplying all vessels arriving at British Hards and Piers, regardless of the nationality of the vessel.

Several vessels of the U.S. War Shipping Administration and the British Ministry of War Transport arrived in the assault area with insufficient stocks of provisions to provide subsistence for embarked troops during the abnormally long period when these vessels were detained in the assault area owing to unfavorable weather for unloading. In at least one instance a British vessel did not have sufficient provisions to meet the needs of its own civilian crew in these circumstances. Since these arrangements were matters of concern between the U.S. Army and the respective merchant services these deficiencies were reported immediately to the Allied Naval Commander Expeditionary Force and Commander U.S. Naval Forces, Europe, with a request that appropriate British and U.S. shipping agencies and the U.S. Army be requested to take remedial action. To meet the immediate needs for provisions in these cases the U.S. Army made rations available in required quantities from its dumps on the far shore.

The basic plan provided that provisions for depot and accommodation vessels located off the far shore should be replenished by the U.S. Army on D + 11 and every 10 days thereafter direct from vessels in the shuttle service. This arrangement was made with the U.S. Army in order to avoid the necessity for landing these provisions across the beaches and then transporting them by boat to the depot and accommodation vessels. For some reason not known this desired arrangement could not be accomplished by the U.S. Army and provisions were landed on the beaches making it necessary to get these stocks to final destination afloat.

Accountability for provisions and certain approved articles of clothing and small stores was suspended for landing ships and craft, minor support vessels and far shore activities effective 1 June 1944 by authority of the Bureau of Supplies and Accounts, Navy Department, to meet operational needs in this respect. The resumption of normal procedure will be undertaken as soon as operational conditions permit.

1. Clothing and Small Stores

Provision was made for the gratuitous issue of certain specified essential items of Clothing and Small Stores to meet the urgent requirements of individuals participating in the operation who would be unable to procure such articles in a normal manner. This gratuitous issue was limited to crews of landing ships and craft, minor support vessels and far shore activities at which no facilities for the procurement of such articles could be made available. This gratuitous issue was to extend until such time as conditions enabled the establishment of normal facilities on the coast of France.

Accountability for certain articles of clothing and small stores was suspended effective 1 June 1944 under the conditions set forth above in connection with articles of Provisions.

Navy Department Bulletin of 1 September 1943 authorized the emergency of Clothing and Small Stores, Special and Protective Clothing, and Ship's Store Stock to survivors of ships and craft lost or damaged. This authority did not specifically include personnel of the U.S. Army or the military and Naval personnel, merchant crews and civilians of neutral and allied nations who might be received by Naval activities as survivors. Authority to provide for survivors of the classes mentioned in the same manner as that specified in the Bulletin was obtained from the Navy Department and this information was published to the forces of this command.

2. FISCAL

Ships and Craft except BBs, CAs, CLs, DDs, APAs, AKAs, AGC scheduled to participate in operation [redacted] were directed to land their Disbursing Officers and records and accounts at a centralized activity established by Commander Service Force 122. This activity was located at Receiving Barracks, Vicarge Field, Plymouth. As soon as conditions warranted normal procedure was to be resumed.

In the case of the vessels excepted above Disbursing Officers were not landed. These vessels, prior to departure for the operation, were directed to land sufficient data to enable immediate reconstruction of the pay account of those on board if necessary. After landing such data all disbursements on account of pay then were suspended until otherwise directed. On D + 8 the restriction on disbursements was modified to be effective upon arrival of a vessel in the U.K. port or upon departure of a vessel from the designated assault area. The restriction was to be effective again under the same conditions upon departure of a vessel to return to the assault area.

A directive was issued that the accounts of all officers serving on board vessels released from accountability for provisions were to be checked at the rate of 70 cents per day unless written evidence was furnished showing payment for subsistence had been otherwise made. The same checkage was directed to be made against the pay accounts of all officers serving on the far shore until such time as conditions made it possible to adopt normal accounting procedure in designated localities in that area.

AIR REPORT

I. ORGANIZATION AND CONTROL.

1. The NINTH U.S. Army Air Force and the SECOND British Tactical Air Force combined were employed as one Tactical Air Force in support of Operation [redacted] Operations of the U.S. Strategic Air Force and British Bomber Command were coordinated with, and units of these forces as required were used to augment Tactical Air Force operations. The following aircraft were available in the United Kingdom at the time of the invasion:

	Light Bombers	Medium Bombers	Heavy Bombers	Fighters	Total
U.S. 8TH ARMY AIR FORCE			2234	903	3137
U.S. 9TH ARMY AIR FORCE	156	467		1277	1900
R.A.F.	237		957	1306	2500
	393	467	3191	3486	7537

2. Under the general direction of the Supreme Commander Allied Expeditionary Force, the Air Commander-in-Chief Allied Expeditionary Air Force, at Allied Expeditionary Air Force Headquarters, Stanmore, England, commanded the Allied Air Forces allotted for direct participation in the operation and coordinated strategic and tactical operations. Operational control was exercised by the Commander Advanced Allied Expeditionary Air Force at Headquarters, Uxbridge, England, through the Combined Operations Room and Combined Control Center, Uxbridge. Combined Headquarters, Plymouth, was manned by representatives of the Naval Commander, Western Task Force, and the NINTH Army Air Force. This Headquarters monitored the Air Support Channels of the Western Task Force, the NINTH Army Air Force Command Channel, and one direct teleprinter circuit to Advanced Allied Expeditionary Air Force Headquarters, Uxbridge, England. Combined Headquarters, Plymouth, was maintained to furnish a standby headquarters and to keep a record of air activity in the Western Task Force Area. Representatives of the Naval Commander Western Task Force were stationed at Advanced Allied Expeditionary Air Force Headquarters and in the Fighter Director Tender in the Assault Area for the purpose of coordinating operations and keeping the Air Force advised as to the Naval dispositions and requirements.

3. The close proximity of the assault beaches to the United Kingdom was such that control of aircraft was exercised from the United Kingdom until such time as Control Centers were established on the Continent. During this phase of the operation Air Force Representatives in Task Force and Assault Force Flagships, Fighter Controllers in Fighter Director Tenders, and Air Support Parties with Assault Forces were delegated certain control functions and responsibilities as set forth in this report.

II. AIR FORCE REPRESENTATION, FLAGSHIPS.

1. Air Representatives of the rank of Colonel embarked in the Flagships of Naval Commander Western Task Force and Assault Force Commanders had the following responsibilities:

(a) Keeping the Tactical Air Force Commanders in the United Kingdom informed of the military and naval commanders' intentions and requirements.

(b) Giving air advice to the Military Commander on board.

(c) Giving air advice to the Naval Commander on board.

(d) Relaying calls, if necessary, for air support received from Air Support Parties ashore.

(e) Re-briefing or re-directing, if necessary, the aircraft which arrived in response to calls for support, or in accordance with a set program.

(f) Requesting additional Tac/R as required by the Military Commander.

(g) Re-directing this Tac/R, if necessary, on arrival, and receiving R/T reports from Tac/R aircraft if these were being made direct.

(h) Representing to the Fighter Director Tenders or to the Tactical Air Force Commanders in the United Kingdom the adequacy or inadequacy of the Air cover provided.

(i) Representing to the Naval Commander the requirements of the Fighter Director Tender as regards anchorage, etc., within the Naval Commander's area of responsibility.

(j) The visual direction of fighters on request from the Fighter Direction Tender.

III. AIR OPERATIONS CENTERS, FLAGSHIPS

1. To provide Military and Naval Commanders, and Air Representatives embarked with adequate information of the over-all air situation and to provide command communication facilities, Air Operations Centers were set up aboard Western Task Force and Assault Force Flagships. These Air Operations Centers were manned by Signal, and Controller personnel of the NINTH Army Air Force.

2. The following radio channels were available in the Air Operations Centers:

(a) AIR COMMAND CHANNEL (HF and MF, WT)

The Air Command Channel linked AEAF Advanced Headquarters, Uxbridge, with the Assault and Force Flagships and the Fighter Direction Tenders. This channel was set up as a receiving and transmitting channel but in Operation [redacted] was employed mainly as a receiving channel for information purposes only.

(b) NINTH AIR FORCE COMMAND CHANNEL (HF, WT)

This channel connected the Assault and Force Flagships, and the Fighter Direction Tenders, with Headquarters NINTH U.S. Army Air Force. A two-way channel, the principal use made was the reception of information from Headquarters NINTH Air Force.

(c) WESTERN NAVAL TASK FORCE AIR SUPPORT LIAISON CHANNEL (HF/WTF)

A separate point to point channel between the Flagship Western Task Force, the FUSA Headquarters Ship, and the Representative of the 21st Army Group, Uxbridge, for the purpose of passing intelligence and operational data relative to air support.

(d) FORCE "O" SUPPORT CHANNEL (HF/WT)

A channel for Force "O" units to originate direct Air Support requests. This was a two-way channel between Assault Force "O" Flagship units of Force "O" ashore and the Representative of the 21st Army Group, Uxbridge. Aboard the Task Force Flagship this was a receiving channel only, and traffic, as passed, was copied and recorded.

(e) FORCE "U" AIR SUPPORT CHANNEL (HF/WT)

Same as above for Force "U".

(f) HEADQUARTERS SHIP AIR LIAISON CHANNEL (VHF, WT/RT)

A channel for personal contact communications between command echelon personnel in the Flagships and Uxbridge. Not manned aboard Task Force Flagship because of lack of facilities.

(g) HEADQUARTERS SHIP AIR LIAISON CHANNEL STANDBY (HF, RT-WT)

A high frequency channel to provide personal intercommunication between C.C.C. Uxbridge and embarked Air Force personnel in the Flagships.

(h) HOME SHORE PLOT BROADCAST (LF/WT)

A broadcast of filtered tracks of enemy flights. Trouble was experienced keeping this channel clear because of enemy jamming.

(i) AIRCRAFT MOVEMENT LIAISON BROADCAST (LF/WT)

A broadcast of the movements of friendly aircraft.

(j) "Y" BROADCAST - ENEMY INTELLIGENCE.

(k) VHF CHANNELS WERE MANNED FOR VOICE COMMUNICATIONS BETWEEN AIR OPERATIONS CENTERS AND:

(1) Second TAF Fighter Bombers, Medium and Light Bombers (in the air)
(2) R.A.F. Fighters (in the air)
(3) Assault Force Flagships
(4) FDTs
(5) Fighter Bombers and Medium Bombers IX Air Force (in the air)

3. The Air Operations Centers maintained PLOTS of HOSTILE FLIGHTS and an AIR STATUS BOARD showing dispositions of friendly aircraft. In general communications were good and the interested parties aboard were kept informed of enemy as well as friendly air activities.

IV. FIGHTER COVER.

1. The Fighter Cover plans as promulgated, and the Cover Operations as executed, were thorough and the continued threat thereof to the GAF was such that daylight enemy aircraft opposition over the Assault Area and shipping lanes was reduced to an absolute minimum, approximating zero.

2. The day cover of the Shipping Lanes consisted of four squadrons of fighter aircraft operating at from 3,000 to 5,000 feet altitude on ninety minute patrols, relieved on station. One squadron maintained a patrol over each flank, one over the North half, and over the South half of the Shipping Lane was the other, from 0430 to 2330 each day, weather permitting. Night cover of the Shipping Lanes was on an "on call" basis controlled from the near shore.

3. The Assault Area was divided into two areas, namely, Eastern (British Beaches) and Western (American Beaches). The Assault Area consisted of an area extending five miles inland and fifteen miles to seaward of the beaches. Low cover over the Western Area consisted of three squadrons of aircraft operating on patrols, one over Beach OMAHA, one over Beach UTAH, and one along the northwest flank of Beach UTAH. This cover was maintained at altitudes between 3,000 and 5,000 feet. High cover consisted of a total of three squadrons operating over the combined Eastern and Western Areas. Each of the three squadrons was deployed in three levels between 8,000 and 15,000 feet. A portion of the high cover was basically assigned to patrol five miles inland approximately on the border line between the Eastern and the Western Areas. The balance was equally divided between, and centrally deployed, over each of the two areas. Night cover consisted normally of twelve (12) night fighters on patrol continuously during darkness.

4. Fighter Director Tenders (converted LSTs) Numbers 13, 216 and 217 were stationed in the Shipping Lane, Western, and Eastern Areas respectively, for the purpose of controlling fighter cover in those areas. The senior representative of the Combined Control Center, Uxbridge, was in FDT 217 and was responsible for switching fighters from one area to another, as necessary, for reinforcement purposes. Incoming patrols reported in to the FDTs when they were five minutes flying time from the Assault Area and departing Patrols reported their departure. In this manner the control ship had, at all times, a clear picture of the cover overhead and enroute. With the numbers of aircraft operating by day in the Assault Area and consequent saturation of the radar equipment, vectoring of fighters was impracticable. Night fighter direction, however, was normal. Each FDT operated two air-sea rescue launches. Calls for the services of the launches were not frequent, but when required they were despatched promptly. FDT 216 remained in constant communication with the Task Force and Assault Force Flagships and rendered a valuable service in passing plots of enemy flights. This augmented and supplemented the service of the Home-Shore Plot Broadcast.

V. AIR SUPPORT

1. Air Support Parties (Army Force personnel) suitably equipped with vehicular mounted VHF and HF radio sets were landed with each Regimental Combat Team, Division and Corps Headquarters. Requests for air support originating on the CONTINENT were transmitted directly to 21st Army Group Operations Room at Uxbridge by the Air Support Party attached. Such requests were monitored, and where necessary, relayed by the Assault Force Flagships and radio PLYMOUTH. Requests originating in the Task and Assault Force Flagships were given to the Air Representative embarked and transmitted directly to Uxbridge; those originating in the Assault Force Flagships were monitored by the Task Force Flagship. All requests were filtered in the 21st Army Group Operations Room and passed on to the Air Force Combined Operations Room, Uxbridge, for action.

2. During the Preparatory Period (D-90 to D day) air bombing commitments included:

   (a) Enemy aircraft factories and assembly plants, ball bearing and aircraft accessory plants, and aircraft on the ground.

   (b) Strategic rail centers, and, in particular, those which include servicing and repair facilities essential to the enemy for the maintenance of rail communications in Northern FRANCE, the LOW COUNTRIES, and Western GERMANY.

   (c) Selected enemy coast defense batteries, CROSSBOW targets and Naval installations.

   (d) Airfields and their installations, in particular those within 130 miles of CAEN and in the BREST-NANTES area.

3. As D-day approached, attacks by air were intensified and focused on key points more directly related to the Assault Area. Attacks on certain coastal batteries were included in this phase. To avoid disclosing the [redacted] Area, attacks on batteries in this Area were kept at one-third of the total effort against this type of target.

4. The maximum effort of pre-planned heavy, medium and fighter-bomber missions were executed the night of D-1/ D-day and the morning of D-day. Low ceiling on the morning of D-day precluded effective pre-H hour bombardment by heavy bombers of OMAHA Beach, as scheduled. To the failure of this mission may be attributed a great deal of the difficulty experienced in gaining a foot-hold on OMAHA Beach.

(99)

VI. AIR SPOT

1. The following aircraft groups operating from RNAS, Lee-on-Solent, participated under the 2nd TAF in the Air Spotting for the Fire Support Ships of the Western and Eastern Task Force:

   (a) No. 3 Naval Fighter Wing, F.A.A. (Nos. 808, 885, 886, 897 Squadrons) in Seafires.

   (b) Nos. 26 and 63 R.A.F. Squadrons in Spitfires.

   (c) Nos. 2, 268, and 144 R.A.F. Squadrons in Mustangs, up until approximately noon of D-day.

   (d) Seventeen U.S. Naval Aviators from Cruisers and Battleships in Spitfires.

2. Initially, and until noon of D-day, approximately 159 aircraft were available to the Air Spot Pool at Lee-on-Solent. At noon, D-day, the R.A.F. Squadrons Nos. 2, 268 and 144 were withdrawn for reconnaissance missions leaving approximately 95 fighters available.

3. Up until noon of D-day ten frequencies (VHF, Voice) were allotted to the Western Task Force for spotting. From noon of D-day onwards five frequencies were allotted to the Western Task Force.

4. Fire Support Ships and spotting aircraft were supplied with 20 complete sets of VHF crystals. Each Fire Support Ship was assigned one frequency and a call sign. Crystals were readjusted in the aircraft VHF radios at Lee-On-Solent when necessary in order to conform with the frequency of the assigned Fire Support Ship.

5. Following the pre-arranged missions on D-day, requests for air spot on specific targets or targets of opportunity, and information as to which Fire Support Ships would be employed, were passed to Allied Naval Commander Expeditionary Force by Assault Force Commanders with information to Naval Commander Western Task Force.

6. Prior to departure from Lee-On-Solent, for their spotting missions, pilots were briefed on two pre-arranged targets or specific areas to be searched for targets of opportunity. In other cases, pilots were instructed to report via VHF radio (voice) to assigned Fire Support Ships in the area for target briefing. Often times, the Fire Support Ship would direct the spotting aircraft to scout specific areas to provide intelligence information. When a target was located and reported by the pilot, the ship would determine advisability of engaging the target with Naval gunfire.

7. Four hundred fifty three (453) spotting missions were flown from D day (6 June) to D + 19 (25 June) over the Western Task Force Area. Twenty-two per cent of all missions flown during the twenty day period took place on D day. Each mission consisted of two aircraft acting as a team, one to spot, the other known as a "weaver", to protect the spotter. The spotting aircraft were prepared to spend a maximum of 45 minutes over the target area. The spotting table gives in detail the Air Spotting effort by dates:

SPOTTING MISSIONS

DATE	TOTAL NO.	NO. ACTUALLY SPOTTED	NO. FAILING TO SPOT
D Day	101	50	51
D + 1	79	37	42
D + 2	50	25	25
D + 3	0	0	0
D + 4	37	13	24
D + 5 to D + 11	106	30	76
D + 12 to D + 18	29	7	22
D + 19(Cherbourg)	51	25	26
TOTAL	453	187 42%	266 58%

NOTE: No spotting on D + 3 due to inclement weather.

8. Only 42% of the Spotting Missions flown actually spotted naval gunfire. This was due to the following causes: Radio communications and engine failures, inability to locate or find suitable targets of opportunity, ships not in correct position to fire, weather, flak and action of enemy fighters. Thirty-seven (37) (14%) of the two hundred sixty six (266) missions that failed to spot failed because of breakdown in radio communications. Fifteen missions (6%) were aborted by aircraft failure.

9. Two hundred sixty three (263) (58%) of the four hundred fifty three (453) missions flown were impromptu types. The remaining one hundred ninety (190) (42%) missions were pre-arranged.

10. A total of two hundred twenty nine (229) different shoots were executed with aircraft spotting the gunfire from D day through D + 19 days. Approximately 70% of all air spotting shoots were directed against coast defense guns, field artillery and flak batteries of various calibers. Of the remaining shoots, 13% were directed against communication facilities of various types, 10% against Troop Concentrations, and 7% against mechanized tanksand vehicles.

11. One hundred seventy-two (172) (75%) of the two hundred twenty-nine (229) shoots conducted with air spotting produced neutralization or destructive effect. The remaining fifty-seven shoots (25%) missed the target area and were assessed as ineffective.

12. Eighty-one (81) missions (18%) of the four hundred fifty-three (453) in the Western Task Force Area were flown by the seventeen U.S. Naval pilots. Approximately 10% of all the missions in both the Western and Eastern Task Force Areas were flown by these pilots. These pilots were drawn from U.S. Cruisers and Battleships and qualified in Spitfire aircraft and the employment of the Allied Naval Assault Spotting procedure prior to day.

13. Nine spotting aircraft were lost in the Western Task Force Area. Eight losses were caused by flak and one loss was attributed to weather.

14. Air Spotting was conducted in accordance with procedure outlined in Allied Naval Assault Gunnery Instructions dated 11 April 1944. The Clocking method, also known as ship control, was employed by pilots during 220 of the 229 spotting shoots. This procedure makes use of the clock grid and the pilot reports the location of the fall of the shot with reference to the hour and distance from the target. The line of fire method, also known as Air Control, of spotting was only used for nine shoots. With this method of spotting naval gunfire, the pilot orders corrections to place the salvos on the target. The procedure as outlined in the Allied Naval Assault Gunnery Instructions, was employed exclusively by both British and U.S. Pilots and worked well.

VII. ANTI-AIRCRAFT DEFENSE AND AIRCRAFT RECOGNITION.

1. During the Assault anti-aircraft fire discipline was excellent. After the Assault forces began their withdrawal, and the build-up of merchant types commenced, fire discipline deteriorated, particularly on merchant ships and small naval ships. As soon as one vessel opened fire during the dark many others would follow suit, irrespective of whether or not planes were seen or heard overhead, or hostile acts committed. Steps were taken to correct this situation. Rigid restrictions were placed on those vessels within the Assault Area. Merchant ships were restricted from firing at any time during darkness. Small Naval ships were prohibited from firing during darkness unless directly attacked. By D + 7 day, the AA fire situation was well in hand, and thereafter discipline

1. (Continued)
was again good. At all times the fire discipline of the Destroyers, Cruisers, and Battleships was excellent.

2. Barrage balloons flown by ships and craft in the Assault Area was kept close hauled until after the first landings were made. After H-hour balloons were flown at 1000 feet unless visibility was less than 1500 yards or cloud ceiling less than 1000 feet in which case balloons were flown at 300 feet.

3. Aircraft recognition officers were attached to all major men-of-war. Aircraft recognition personnel of the Royal Observer Corps were detailed to all transports and merchant ships participating in Operation [redacted] Prior to the Operation, extensive training had been given to personnel of the smaller craft at the various landing craft bases. To aid in recognition, all Allied aircraft were painted with distinctive markings on D-day.

4. In spite of all these preventive measures, it is the fact that a few Allied aircraft were shot down by our forces.

VIII. SCALE OF ENEMY EFFORT.

1. The enemy air effort against the Shipping Lanes and the Assault Area during the assault phase, and subsequently, was on a scale appreciably less than had been anticipated.

2. The only air attacks directed against shipping in the Western Task Force Areas was during darkness. Enemy night activity was largely confined to minelaying. There was some night bombing. Flares (aerial and floating) were dropped nightly over the shipping and the beaches, but little follow-up was made.

3. As our air ascendency mounted, confidence increased and it soon became common practice, when aircraft appeared in daylight, merely to ask which type of friendly plane was in sight - never to bother about their being "Jerries".

IX. USE OF AIR SMOKE

1. Two squadrons of Boston (A-20) aircraft were available for laying smoke during the assault phase.

2. The only smoke mission called for by the Western Task Force was the laying of a screen between Force "U" transport area and the shore batteries North Westward of Force "U" on the morning of D day. This mission was executed on time as requested.

X. AIRBORNE OPERATIONS

1. The 82nd and 101st Airborne Divisions were flown from the United Kingdom on the night of D-1/D day to a dropping point on the Contentin Peninsula. Reinforcements were flown in on the afternoon of D day and morning of D + 1 day.

2. Extensive last minute changes made in the plans for the dropping of the Airborne Divisions caused the route to pass over Force "U" Assault Area. Information concerning these changes was disseminated by the Naval Commander Western Task Force, to all naval units concerned, and the large group of Troop Carrier Transport planes and gliders, over 1,000 in all, passed over the ships in the Assault Area without being fired on by any friendly gun.

XI. ANTI-SUBMARINE PATROLS

1. The Coastal Command flew continuous patrols protecting the Eastern and Western approaches to the Assault Area from surface craft and U-Boat attack.

XII. PLANNING AND TRAINING.

1. A close liaison was maintained during the planning and training period between the Naval Commander Western Task Force, and the Commanding General, NINTH U.S. Army Air Force. A high degree of cooperation was manifested between the Ground Forces, the Naval Forces, and the Air Forces.

2. Large scale maneuvers, simulating battle conditions, were held during the spring of 1944. Air participation was planned for the following exercises: FOX, 8 - 12 March; MUSCRAT 11, 25 - 27 March; BEAVER, 29 - 31 March; TIGER, 23 - 28 April; and FABIUS, 5 - 10 May. Inclement weather materially reduced air participation in all exercises except FABIUS.

XIII. DAILY SUMMARY

D - 1 (5 June)

At 1600 day air cover reported on station and at 2300 was relieved by night cover according to plan. No direct support missions were originated or relayed by Flagships. On approach to the Assault Area enemy AA fire was observed on the beach. No enemy aircraft action was observed.

ANNEX D - AIR OPERATIONS

D Day (6 June)

Day and night air cover operated according to plan. At 0721 radar and radio silence was broken and control of fighter cover in the Western Task Force Area was assumed by FDT 216. Five (5) direct support missions were originated or relayed by Flagships of which four (4) were flown. Enemy air activity in the Western Task Force Area was slight and consisted of mine laying, flare dropping and reconnaissance flights during darkness only. Two enemy aircraft were reported shot down, one by air cover and one by USS MALOY. Enemy aircraft attacks were countered by AA fire from ships. Advanced Headquarters, NINTH Air Force reported that paratroop drop had been successful. Commanding General NINTH Air Force, estimated the enemy air capabilities to be 360 LRB, 325 SEF, 100 FB, 200 TEF, and 60 reconnaissance aircraft.

D + 1 (7 June)

Day and night air cover operated according to plan. Armed reconnaissance missions flown by aircraft of the air cover and the unexpectedly slight enemy air activity reduced the number of air cover sorties. Sixteen (16) direct support missions were originated or relayed by Flagships of which nine (9) were flown. The enemy repeatedly jammed the Aircraft Movement Liaison Broadcast Channel. The enemy operated approximately fifty aircraft over the Western Task Force Assault Area near midnight. Night fighters destroyed one Ju 88. Mines were laid. Enemy bombing results were negligible. Commanding General NINTH Air Force estimated that the disposition of the German Air Force would be completed by dawn 8 June. Fighters and bombers from northwest Germany were being transferred to France and Belgium.

D + 2 (8 June)

At 0430 day cover reported on station relieving the night cover. At 1600 cover was reduced because of weather. By 2210 all cover was withdrawn because of bad weather which delayed the reporting of the night cover. Twenty-six (26) direct support missions were originated or relayed by Flagships of which fifteen (15) were flown. There was some duplication of requests. Only seven (7) requests were actually refused. During darkness three (3) attacks were made on shipping in the Assault Area by a total of approximately fifty (50) enemy aircraft. Flares were dropped and mines laid. Bombing results were negligible. The attacks were countered by AA fire, which brought down one (1) enemy aircraft in the Assault Area. The USS ANCON reported that

D / 2 (Continued)

Me 109's and Fw 190's were using Allied Special Identification Markings. The Air Support Party of the 101st Airborne Division on shore established radio communication with Direct Support Aircraft and Air Force Headquarters.

D / 3 (9 June)

Weather improved and at 0010, night cover reported on station. At 0430 night cover secured but no day cover reported because of weather. Weather prevented a continuous patrol of day cover. At 2330 night cover reported on station. Thirty-one (31) direct support missions were originated or relayed by Flagships of whichnone were flown because of weather. Approximately fifty enemy T/E bombers, mostly Ju 88's, were estimated to have operated against the unloading points on the beachheads during darkness. Bombs were dropped. Mines were laid within the screened area. Enemy fighter reconnaissance missions were flown both during the day and night in the Assault and Approach Areas. A night fighter shot down one Ju 88. Commanding General, NINTH Air Force estimated capabilities of enemy Air Force as five hundred plus fighters and three hundred sixty bombers.

D / 4 (10 June)

Day and night air cover reported on station according to plan. Naval Commander Western Task Force advised the day air cover to stay clear of Assault Area until daylight because of heavy flak. From 1405 until 1447 there was no air cover because of weather. Twenty-seven (27) direct support missions were originated or relayed by Flagships of which twelve (12) were flown. Approximately twenty plus enemy bombers operated over the Western Task Force Area during the night. Flares were dropped resulting in heavy AA fire. Bombs were dropped with negligible damage. One enemy aircraft was shot down by ship in area screen. One Ju 88 was reported shot down by a friendly fighter. Commanding General, FIRST U.S. Army left the AUGUSTA to assume command ashore as of 102300B.

XIV. RESUME

Because of the extremely light enemy air activity in the Assault Area and the increased number of requests for armed reconnaissance, the number of sorties in the air cover decreased rapidly. After 12 June requests for air support were being sent directly from the Army Command Posts on the Continent.

ANNEX D - AIR OPERATIONS

Enemy air activity during the period was sporadic and the bombing results were negligible. The chief enemy air activity consisted of mine laying in the shipping areas and convoy lanes during darkness. On 15 June a convoy entering the Western Task Force Area was attacked by dive bombers. One LST damaged.

15 June

One Fighter Control Station on the Continent became operative. FDT 217 took over the duty from FDT 216 as standby for the Fighter Control Station on the Continent. The FDT 216 returned to the U.K. FDT 13 took station 20 miles northeast of Barfleur to counter enemy torpedo/bomber aircraft.

22 June

Complete Fighter Cover Control was taken over by 70th Fighter Control Wing. FDT 217 departed for the U.K.

23 June

Army Air Force Controllers and radio operators transferred from the USS AUGUSTA to the U.K.

25 June

USS BAYFIELD with Commander Force "U" embarked departed for the U.K.

27 June

USS ANCON with Commander Force "O" embarked departed for the U.K.

1 July.

USS AUGUSTA departed for the U.K. Naval Commander Western Task Force transferred to USS THOMPSON.

3 July

USS THOMPSON with Naval Commander Western Task Force embarked departed for the U.K.

XV. CONCLUSIONS AND RECOMMENDATIONS

1. Coordinated planning and preparatory training exercises involving the Army, Navy and Air Force participating in a combined operation are essential to good performance.

Exchange of representative liaison officers is desirable.

2. Low altitude dive bombing attacks are more effective than horizontal bombing attacks against batteries and other point targets.

3. During darkness aerial mining in anchorages and shipping lanes is more economical for an inferior air force and generally more effective against ships than aerial bombardment.

4. In an area where enemy aircraft and heavy anti-aircraft fire can be expected, Fighter/Observation aircraft, either shore based or carrier based, are more suitable than combat ship based seaplanes for spotting Naval gunfire.

5. Shore based air control centers are considered preferable to ship based centers in the control of air cover and air missions, when such shore based control centers are readily available. In a large operation it appears desirable that the control of fighter cover should be divorced from flagships and delegated to ships specially fitted for the purpose.

6. Naval authorities must be given ample warning of contemplated air operations over shipping, in order that detailed information can be disseminated to the ships concerned.

7. In a large operation, where both friendly and enemy aircraft may be expected to operate, a rigid and simple set of anti-aircraft firing rules should be promulgated for each type of ship or craft in the area. It appears desirable that merchant ships and small Naval ships be directed not to fire during darkness.

8. For a large operation, such as the one just concluded, new and distinctive markings on friendly aircraft for the operation is a valuable aid to recognition.

I. COMMUNICATIONS

1. Communications were generally as satisfactory as in previous large amphibious operations. There were no noteworthy departures from normal amphibious communication procedures during this operation. The difficulties experienced were similar to those reported in previous amphibious operations. The more important of these are noted below:

   (a) On some circuits traffic assigned a precedence of priority was frequently delayed as much as twelve hours. This was due to various causes, viz:

      (1) Improper drafting of despatches.
      (2) Improper assignment of precedence to despatches.
      (3) Excessive number of addressees.
      (4) Use of cumbersome cryptographic system.
      (5) Use of cryptographic system not held by addressees.
      (6) Incompetent personnel, particularly radiomen.

   (b) Voice circuits were generally overloaded and a general lack of security in the use of such circuits was noted.

   (c) The call sign system was unsatisfactory in that it required the use of too many publications.

   (d) It was again demonstrated that a combatant vessel is not the best flagship for a large amphibious operation.

II. SPECIAL EQUIPMENT

1. Comment on the operation of special equipment, not strictly communication equipment, is given below:

   (a) Radar operation was satisfactory. There was some indication that enemy planes were using Allied I.F.F.

   (b) Equipment for the jamming of radar controlled shore batteries was used extensively in this operation. This equipment was of great value particularly in protecting mine sweepers from the fire of shore batteries during darkness.

(c) Counter guided missile jammers were used. Numerous reports of control signals were received but there is no positive visual corroboration that glider bombs were used by the enemy.

(d) Equipment was installed to enable ships to make use of the British "GEE" radio navigational system. This equipment operated satisfactorily.

III. RECOMMENDATIONS

1. The following recommendations for future operations are submitted:

(a) In planning every effort should be made to simplify all features of communications, particularly cryptographic aids, call sign systems, and radio frequency plans.

(b) Officers should be instructed in the proper drafting of despatches and in the proper use of voice circuits.

(c) Officers who originate despatches should have a comprehensive knowledge of the operation plan and the communication plan in order that they may know the channels by which despatches are delivered and thus intelligently designate the addressees on a despatch.

(d) The operation plan, insofar as task organization is concerned, should be stabilized as early as possible in order that it may be a guide for making the communication plan. Likewise the number of ships by type to be employed in an operation should be known at an early date in order to facilitate the procurement and installation of additional equipment required.

(e) The operating ability of radiomen must be increased by constant drill and instruction at all times.

(f) The responsibility for the installation and operation of non-communication equipment such as radar, navigational aids, and radar counter-measure equipment should be removed from the communication officer and placed under an appropriate staff officer or department head.

MEDICAL REPORT

I. INTRODUCTION.

Medical Service of the Western Naval Task Force In Operation [redacted] functioned according to plan.

The paramount task of the naval medical service was the seaward evacuation of casualties during the assault and build-up phase. Thus, the naval medical service formed a middle link in the chain of evacuation with the FIRST U.S. Army on the far-shore and ETOUSA plus COMNAVEU on the near-shore.

Early in the planning period, a table of specific responsibilities, both joint and individual, was agreed upon by the responsible echelons of the Army and Navy forces involved. This allocation of responsibilities resulted in a sound basis of planning; each service had a definite plan of action. The high degree of coordination of action during the operational phase came as a natural result of this early understanding.

II. GENERAL INFORMATION.

1. Casualty Handling.

Organized seaward casualty evacuation was primarily effected in LSTs supplemented by Hospital Carriers and APAs.

a. Medical personnel.

Availability - The medical personnel of the operational force was augmented for organized casualty evacuation by approximately 166 Navy medical officers, 100 Army medical officers, 2600 Navy hospital corpsmen and 200 Army enlisted operating technicians.

Operational assignment - Authorized ship's complements were augmented as follows: Each LST was assigned two (2) Navy medical officers and twenty (20) hospital corpsmen. During the early assault phase, the complement of these craft was further augmented by one (1) Army traumatic surgeon and two (2) enlisted assistants. The complement of each APA was augmented by three (3) Navy medical officers, one (1) hospital corps officer and ten (10) hospital corpsmen. Each LCI(L) had two (2) hospital corpsmen assigned to it. Three of the five Hospital Carriers were staffed with U.S. Army medical personnel; the remaining two, with British Army medical personnel.

Training - The Navy medical personnel for LSTs began to arrive in the ETO during the latter part of March and were put through an intensive indoctrination course at USNAASB, Fowey, Cornwall, England.

The Army medical personnel were given a joint indoctrination course by the Army surgical consultants and by the Navy force medical officer and his training officers.

(b) Forces afloat.

Medical service to the forces afloat was normal except for the following:

(1) When peak loads of battle casualties occurred.
(2) For organized casualty evacuation.

From the information available, medical preparation for battle afloat was adequate. Sea rescue and the handling of survivors was frequently complicated by the presence of casualties. The latter, for the most part, were evacuated to LSTs. A considerable number of casualties were evacuated to the U.K.

Casualty handling equipment - Casualty evacuation in LSTs on the scale anticipated in this operation necessitated the provision of special casualty handling equipment. Such equipment was required to facilitate the loading of casualties into LSTs from smaller craft. This equipment was developed and thoroughly tried out in practice exercises and proved most satisfactory under combat conditions.

(c) Casualty records and reports.

Early in the planning stage a need was seen for a simple system of recording casualties evacuated from the far-shore. This need was envisioned because of anticipated volume of casualties to be handled and the fact that many small naval vessels and craft with limited office and clerical facilities were involved. For this reason, a form, "Running Record of Battle Casualties", was developed by this force. This form supplied shore commands in the U.K. with earliest possible information necessary for further casualty reporting to U.S. during the assault phase.

2. Medical supplies.

(a) Problems and requirements.

(1) To "top-off" all craft and vessels to their commissioning allowance level and to supplement that allowance where necessary, prior to the operation.

(2) To provide sufficient medical materiel on LSTs to care for a maximum anticipated casualty lift, both for the initial phase and for the build-up.

(3) To equip or, where necessary, re-equip the Navy medical section of the beach battalions.

(b) Preparation.

A medical estimate of the operational needs was prepared. A thorough study of the medical supply problem was made in conjunction with consultants from the Army and Navy. The medical logistic support section of COMNAVEU procurred the supplies for the operational forces. Included in these supplies were certain items made possible by ETOUSA, namely:

Whole blood.
Penicillin.
Intravenous sulfonamided.
Surgical instrument kit (abdominal).

The medical materiel of the beach battalions was rechecked and deficiencies corrected. Medical jeeps and additional field equipment was provided by the Army Shore Party Brigade.

In accordance with the joint Army and Navy agreement on medical responsibilities, medical re-supply points were established by the Army at the near-shore LST hards in Portland, Southampton and Brixham. The Army agreed further to load these supplies under the supervision of Navy medical representatives at these points.

Three hundred (300) Army "Exchange Units of Medical Supplies" for delivery to the far-shore were handled in accordance with the medical plans and joint agreements. A unit consists of the following:

Blankets	each	320
Litters	each	100
Splint sets	each	4
Dressings	case	3
Plasma	box	8
Splint litter bars	each	24

(c) Operation.

Replenishment of medical supplies on LSTs was effected at the LST hards in cooperation with ETOUSA through its representatives in the Southern Base Section. The maintenance of the stock levels on the hards, their rapid and efficient replenishment, and the maintenance of stock levels on the LSTs reflected most excellent teamwork.

Beach battalions found their initial medical supplies to be adequate when not lost in landing.

The Army "Exchange Units of Medical Supplies" arrived on the far-shore in sufficient quantities to meet the needs. However, it was not always possible to land these "units" in the early trips of the LSTs.

VII. SPECIFIC INFORMATION.

1. Far-shore. (Narrative of events - beaches OMAHA and UTAH).

During the early assault phase, six medical sections of the SIXTH Beach Battalion and three sections of the SEVENTH Beach Battalion were committed to beach OMAHA; six sections of the SECOND Beach Battalion to beach UTAH.

The first naval medical elements landed at H + 40 minutes. During the early period, much hand-carried equipment was lost due to personnel being debarked in deep water. Other medical supplies were lost in craft suffering damage by enemy action.

In spite of the loss of equipment, reports indicate that prompt first aid was administered on the beach insofar as the military situation would permit.

It was a military necessity, as well as a humanitarian need, to keep the beaches cleared of casualties. Therefore, early in the assault casualties were placed in any type of landing craft available and despatched to APAs and LSTs.

In some cases an unavoidable delay occurred on D-day on OMAHA beach in which casualties were not cleared from the beaches for a period of from 4 to 8 hours. This was due to the natural early confusion resulting from strong opposition. Small craft were damaged and sunk, enfilading gunfire persisted and the movement of casualties was a dangerous procedure.

In both beach areas many small first aid points were established very early. As the situation began to settle on D-day, three evacuation points on OMAHA and one on UTAH were established in the line of the normal drift of casualties.

Natural topography, as well as the military situation, dictated the locating of the Navy medical evacuation points. On UTAH, the evacuation point continued to function in its original site, whereas on OMAHA, by D + 5, the evacuation points began to consolidate with the main axis of evacuation which was on EASY WHITE beach. This also was true of the far-shore party medical battalions.

The teamwork of the medical personnel in all forces was observed. This included the Army Air Evacuation group which started functioning at OMAHA beach on D + 4 when 12 cases were evacuated by air. On D + 5, 80 more were so evacuated, and build-up progressed from that point on. It must be pointed out that the Plan did not call for this means of casualty evacuation until D + 14.

The Navy Evacuation Control Officers went ashore with the NOICs. In the UTAH area the Navy Evacuation Control Officer acted as liaison between the Army and Navy and assisted the senior medical officer of the beach battalion. In the OMAHA area the Navy Evacuation Control Officer functioned at the Evacuation Control Center, conjointly with the Army Ground Force and Army Air Force evacuation officers. This unit was established on the main axis of evacuation, adjacent to the air field, and the beach area in conjunction with the 60th and 61st Far-Shore Medical Battalions where a clearing holding unit was established and a final triage of casualties effected.

Estimated casualties evacuated as of 2400, D + 18:

	OMAHA	UTAH	TOTALS
Sea	4,611	11,305	15,916
Air	3,822	1,384	5,206
Totals	8,433	12,689	21,122

2. Forces afloat.

Medical service to the forces afloat was rendered in accordance with plan. Combat ships, auxiliary ships

Forces afloat (continued)

and craft provided medical service to their own personnel and, when overtaxed, evacuated to LSTs and other vessels. The latter was necessary on those ships suffering major materiel damage.

No untoward incident occurred during the approach to the assault area. However, sea rescue and casualty handling entered the picture rather early.

During the early assault phase, small craft and LCI(L)s bore the brunt of the action. At this time, the hospital corpsmen in LCI(L)s and like craft rendered invaluable medical service.

Many of the small craft suffered early materiel damage from beach obstacles, underwater explosions and from shore batteries. In spite of this handicap, the remaining craft rendered first aid and evacuated many casualties seaward. At times, the opposition off OMAHA was so intense that a great degree of confusion was inevitable. However, much credit is due to this personnel for the admirable way in which they conducted themselves.

LSTs began receiving casualties early on D-day. In the UTAH area where the opposition was relatively less, it was possible to dry-out the LSTs which materially facilitated casualty loading. In the OMAHA area, drying-out was not expedient during the early assault phase. This necessitated the use of the specially-developed casualty handling equipment.

As was expected, many of the early evacuated casualties had received little or not preliminary first aid. This difficult task of patient care was met by the medical personnel in LSTs.

On D / 1 Hospital Carriers arrived off both beaches. These vessels were somewhat unsuitable for the task assigned. This was due to several causes, namely: a lack of briefing of the crew, relatively low casualty capacity, ambulance boats designed for British and not American stretchers and duality of operational control. Nevertheless, these factors did not mitigate against the enthusiastic effort to contribute their share in the operation.

Certain of the APAs, APs and AKAs carried casualties on their return trip to the U.K. Particular mention should be made of the U.S.S. BAYFIELD (APA 30) and the U.S.S. ACHENAR (AKA 54). Both rendered invaluable service in the reception and treatment of casualties during certain short periods of absence of LSTs and Hospital Carriers.

The general condition of casualties evacuated by LSTs from the far-shore is shown in the following excerpt from the report of the commanding officer of a Navy Base Hospital: "The Commanding Officer wishes to bring to the attention of the Commander of Naval Forces in Europe the generally excellent condition of combat casualties which have been brought to this hospital. This observation...has been particularly noticeable among the patients transferred on LSTs. ...all measures for treatment of shock, hemorrhage, and infection, including the use of sulfa drugs, and the administration of plasma, penicillin and whole blood has been adequately and intelligently carried out. The excellent primary treatment...has been reflected in their superb morale upon arrival at this hospital."

3. Near-shore.

Near-shore facilities were under the joint control of the U.S. Army and Navy. At this transition point, casualties were unloaded and medical re-supplies loaded. The three receiving points (hards) for casualties evacuated by LSTs were provided at Portland, Southampton and Brixham. The latter was primarily set up as a reserve and was not used. The other two received the majority of casualties evacuated by this force from the far shore.

The Army, being responsible on the near-shore for the receipt and hospitalization of all casualties, made all necessary provisions. COMNAVEU supplemented the Army facilities with the U.S. Navy Base Hospital No. 12 and all Navy medical facilities on the near-shore.

The Army debarked the casualties at the near-shore. The Navy hospital corps officers, one at each LST casualty receiving point, provided the necessary liaison between the incoming vessels and the near-shore Army groups for debarking of casualties from and the medical re-supply to the ships.

The near-shore facilities functioned most satisfactorily. One exception so far reported was at Portland from D / 4 to D / 7 when three convoys comprised of 67 LSTs were awaiting unloading facilities simultaneously. Operations insisted on the priority of loading of ships regardless of casualties. Further, because of congestion, LSTs were kept outside of the breakwater. This necessitated such debarking of casualties as was possible to be accomplished by LCTs. Ten LCMs and fifteen LCVPs which were made available could not be used because of the rough water. The boat trip was a long and rough one and was protested by the Army and Navy medical officers. After 24 hours of this, a British "side-wheeler" was assigned the task. This, however, only carried 36 litters and was difficult to load and unload. It was found unsatisfactory. The situation was most satisfactorily solved by "marrying" LCTs to LSTs, unloading the casualties into the LCTs and taking them to LCT hards made available for this purpose. In one period of just over 3 hours, approximately 1,100 patients were thus evacuated.

Approximate totals of casualties debarked at near-shore hards are as follows:

PORTLAND (Total - 12834)

Date	Casualties	Date	Casualties
D	19	D / 11	1
D / 1	543	D / 12	464
D / 2	17	D / 13	562
D / 3	1466	D / 14	800
D / 4	2269	D / 15	291
D / 5	971	D / 16	3
D / 6	1052	D / 17	1
D / 7	1102	D / 18	301
D / 8	854	D / 19	240
D / 9	329	D / 20	185
D / 10	1144	D / 21	7
		D / 22	213

SOUTHAMPTON (Total - 6065)

D	0	D / 11	579
D / 1	0	D / 12	309
D / 2	280	D / 13	258
D / 3	138	D / 14	1
D / 4	1439	D / 15	324
D / 5	419	D / 16	0
D / 6	486	D / 17	0
D / 7	194	D / 18	227
D / 8	280	D / 19	1
D / 9	279	D / 20	86
D / 10	204	D / 21	263
		D / 22	298

IV. COMMENTS.

1. Personnel casualties.

Analysis - Information contained in battle casualty analysis submitted by CTF 127 is as follows:

The data for the compilation of the following information was obtained from the Running Record of Battle Casualties used during approximately the first eleven (11) days of the operation.

The analysis and classification of wounds as herein tabulated probably does not present an accurate clinical picture of the type and extent of wounds and injuries sustained by U.S. Army and Navy personnel. It is a cursory review taken from the records compiled under battle conditions when a large number of casualties were being received aboard ship for treatment and evacuation.

The ratio of Army to Navy wounded analyzed is approximately 11:1. This ratio cannot be used as a basis for comparison of the type of wounds received. Certain inferences, however, appear to be indicated as follows:

The Navy received slightly more wounds per man.

Of the Navy wounded, a higher percentage were severe.

Burns and blast injuries, wounds of head, face and neck, and simple fractures were higher among Navy personnel wounded.

Extremity wounds in the Army were 13% higher than Navy.

Injuries of the extremities, due to accident, were approximately four times as high in the Army as compared to Navy.

The percentage of chest wounds among Army personnel was nearly twice that of Navy.

Casualties caused by disease among Army personnel approximately doubled that of the Navy.

Conclusions, based on the foregoing, are drawn for this operation only. Eighteen types of wounds are tabulated and a little less than a thousand Navy wounded accounted for. This is not considered a sufficiently large figure from which to anticipate wounds among Navy personnel in future operations, except that one-half

(119)

to two-thirds of all wounds will be sustained in the extremities, and the remainder varying greatly according to the situation opposed. There are over ten thousand Army wounded, which figure is considered sufficient to anticipate wounds and percentage of types in future amphibious assaults.

The tabulation of casualties among prisoners of war that were evacuated is included only as a matter of interest. Analysis shows the following:

Wounds of the extremities are found in approximately the same percent of Axis Army wounded as in U.S. Army wounded.

Wounds of the head, face, and neck, in the Axis Army wounded occur in lower percentages than in the U.S. Army wounded.

Wounds of the chest and abdomen in the Axis Army wounded occur in higher percentages than in U.S. Army wounded.

BATTLE CASUALTY ANALYSIS DERIVED FROM RUNNING RECORD OF BATTLE CASUALTY REPORTS RECEIVED FROM D THROUGH D + 11.

Type	Army	Navy	Total	Percent Army	Percent Navy	Wounds per Man - Army	WOUNDS Per Man - Navy
Wounded	10,864	968	11,832	91.8	8.2		
Wounds	13,332	1,516	14,838	89.8	10.2	1.23	1.57

Types of Wounds	U.S. Army	U.S. Navy	TOTAL	Percent Army	Percent Navy	percent Total Army Wounded	Percent Total Navy Wounded
Burns	127	43	170	74.7	25.3	0.95	2.84
Head, Face and Neck	1498	254	1752	85.6	14.5	11.25	16.74
Chest	1471	101	1572	93.6	6.4	11.05	6.66
Abdomen	245	23	268	91.4	8.6	1.80	1.52
Extremities							
-due to enemy	7702	655	8357	92.2	7.8	57.81	43.21
-accident	550	18	568	96.8	3.2	4.13	1.19
-s.fracture	108	80	188	57.4	42.6	0.81	5.27
-S.fracture accident	245	6	251	97.6	2.4	1.80	0.40
-comp.fracture	254	47	301	84.4	15.6	1.91	3.10
-traumatic amputations	27	4	31	87.1	12.9	0.20	0.26
Total	8886	810	9696	91.6	8.4	66.70	53.43
Minor Wounds	108	28	136	79.4	20.6	0.81	1.85
Blast Injuries	220	205	425	51.8	48.2	1.65	13.52
Groin	63	6	69	91.3	8.7	0.47	0.40
Spinal cord	24	3	27	88.9	11.1	0.18	0.20
Gas Gangrene	4	0	4	100.0	0.0	0.03	0.00
Mental Disease	137	13	150	91.3	8.7	1.03	0.86
Cardiac Disease	4	2	16	66.7	33.3	0.03	0.13
Urinary Calculi	3	1	4	75.0	25.0	0.02	0.07
Other Diseases	532	27	559	95.2	4.8	3.99	1.78
TOTALS	13322	1516	14838	89.8	10.2	100.00	100.00

TRIAGE

	U.S. ARMY	U.S. NAVY	TOTAL	Percent U.S. ARMY	Percent U.S. NAVY
A - Ambulatory	3651	357	4008	91.3	8.7
B - Transportable	6620	500	7120	93.0	7.0
- non-transportable	593	111	704	84.2	15.8
TOTALS	10864	968	11832	91.8	8.2

BATTLE CASUALTY ANALYSIS

PRISONERS OF WAR

Wounded Casualties 876
Total Wounds 1,328

Type of Wounds	Number	Percent
Burns	7	0.53
Head, face, & neck	116	8.73
Chest	234	17.62
Abdomen	34	2.56
Extremities	899	67.70
Minor Wounds	4	0.30
Mental Diseases	1	0.08
Groin	13	0.97
Spinal Cord	1	0.08
Gas Gangrene	1	0.08
Blast	6	0.45
Other Diseases	12	0.90
TOTALS	1328	100.00

TRIAGE

Triage	Number	Percent
A - Ambulatory	179	19.3
B - Transportable	629	72.9
- non-transportable	68	7.8
TOTALS	876	100.0

2. Casualty evacuation statistics based on organized casualty reports D through D / 11.

(a) LSTs.

Trips made with casualty loads.

A total of 106 LSTs (WNTF) participated in the operation. Of these, 95 carried casualties on one or more return trips from the far-shore. Of these 95 -

49 made 1 trip.
41 made 2 trips.
4 made 3 trips.
1 made 4 trips.

Casualties carried.

Avg. per LST on 1st trip - 70.24 (6673 casualties)
Avg. per LST on 2nd trip - 106.56 (4369 casualties)
Avg. per LST on 3rd trip - 76.0 (304 casualties)
Only 1 LST made a 4th trip - (179 casualties)

Avg. per LST for the period covered by this report - 78.4

Largest single load recorded - 331.

Specific LST loads over 300 casualties - 2
Specific LST loads over 200 casualties - 16
Specific LST loads over 100 casualties - 28
Specific LST loads less than 100 - 101

Number of casualty loads by LSTs - 147

(b) APAs, APs, AKAs.

Of the ten involved in the operation, two made two casualty evacuations to the near-shore, six made one and two made none.

Total casualties evacuated - 560
Average loads - 56

(c) Hospital Carriers.

Of the five hospital carriers involved, one completed one evacuation, two completed two, one completed three, and one made none (mined).

Total casualties evacuated - 2272
Average load - 284
Largest single load - 643

(d) LCI(L)s

Six casualties were returned to the near-shore by this type craft.

(e) Summary.

Percentage of casualties evacuated by -

LSTs	79.63
APAs, etc.	3.86
Hospital Carriers	16.46
LCI(L)s	0.04

V. RECOMMENDATIONS.

That joint Army and Navy agreements on zones of responsibility be drawn up as a preliminary step in an amphibious operation.

That a medical estimate of the situation be made early in the planning stage, keeping it current in order to have a concrete basis for operational planning.

That medical personnel for evacuation be made available in sufficient time to permit reasonable training and indoctrination.

That joint training of the medical personnel of the beach and shore party be stressed.

That sufficient casualty exercises be held for the purpose of coordination and teamwork.

That all vessels and craft be "topped-off" with medical supplies prior to the operation.

That the first aid instruction be emphasized to all personnel.

That small-boat crews, especially for assault craft, be thoroughly trained in their phase of casualty handling (shore-to-ship phase).

That whole blood and penicillin be supplied to the evacuation vessels having proper refrigeration facilities.

That the Army "Exchange Unit of Medical Supplies" be charged to Navy lift but shown on the Army load Manifest in order to facilitate the unloading on the assault landing beach.

That a Navy Evacuation Control Officer be trained with the Far Shore Party and Beach Party.

That operational casualty reporting be as simple as possible.

TRAINING AND REHEARSALS REPORT

On December 17, 1943, a directive for amphibious training was issued directing the ELEVENTH Amphibious Force to arrange for the amphibious training of Naval Forces and such Army divisions as were to be assigned by the Commanding General of the FIRST U.S. Army.

Amphibious training for the assigned divisions was carried out generally along the Southern Coast of England and particularly in the SLAPTON SANDS Area: Training exercises were first scheduled for battalions and Regimental Combat Teams: Finally full division and Corps rehearsals were held with all supporting elements, which included Engineer Special Brigades. Sea and air support units were exercised in conjunction.

Every effort was made to simulate conditions that would obtain in the assault area. An important factor was the training of landing craft in beaching and retracting on flat beaches with large tidal range. It is felt that this training paid big dividends. Another noteworthy feature was the training of landing craft in keeping the narrow swept channels with current running up to 3 knots.

Full scale rehearsals were held during periods 24 to 28 April for Force "U" and 3 to 8 May for Force "O". These rehearsals involved a movement to sea of combat loaded transports, LSTs, LCI(L)s, escorts and gunfire support ships, as well as build-up forces. Shuttle and ferry control were exercised also. Due to the proximity of enemy aircraft, submarines, and E-boats, these operations were undertaken at considerable risk. During Exercise "Tiger" German E-boats caused the loss of 2 LSTs and badly damaged another.

It is considered that these operations were well-planned and efficiently executed. With the exception of beach and underwater obstacles and the absence of a number of the gunfire support ships, the rehearsals simulated as nearly as possible the actual assault. It is extremely difficult in this type rehearsal to create the critical situation that occurs on every assault, i.e., of beaches heaped with supplies, boats disabled and the Army supply system in danger of a breakdown. A full-scale unloading was exercised in these training operations and served to acquaint the beach organizations with the real problems involved and permitted many corrective measures to be taken.

Particular information pertaining to the training of individual units such as Shore Fire Control Parties, Demolition Units, Bombarding Ships, Beach Parties, etc., will be found in other annexes of this report which deal directly with the respective unit.

ANNEX G - TRAINING AND REHEARSALS

MINES, MINEFIELDS AND MINESWEEPING FOR OPERATION NEPTUNE

I. PROBLEMS AND REQUIREMENTS

(a) Suspected enemy minefields and a complete plot of mines detonated and swept together with ship casualties are listed in Appendix 1 and plotted in Appendix 2 to this Annex. No minelaying was required by the Western Naval Task Force. British minelaying is covered by Operation [redacted] in ON 2. Minefields and swept channels adjacent to coastal waters of the United Kingdom used for assembly and approach prior to D-day are shown in Admiralty M.O. and S.O. charts, respectively. British Hydrographic Office charts were used for planning, navigational purposes, and for overlays drawn to scale. U.S. Hydrographic Office charts were not of the same scales and were not generally referred to.

(b) The detailed planning of assault channels was produced by the minesweeping staff office of ANCXF. The Minesweeping Problem in a Cross Channel Operation was first described in X.F.P.M., Chapter 15, issued 15 February 1944. About the same time a provisional layout of the ten assault channels and transport areas as proposed by ANCXF was presented for study to this command, and included in the X.F.N.P. issued on 28 February 1944, and the ON of 10 April 1944.

(c) "Clair Quiz" was the name of the system used during the assault phase for reporting mines, minefields and swept channels. This system was initially effective, but was departed from by originators who resorted to ordinary despatches, which appear to more accurately describe the particular situations. Daily reports of completed sweeping, mines detonated and casualties were made by Commander Minesweepers WEST.

II. PREPARATION AND PLANNING.

(a) Details of minesweeping were discussed with the two assault force commanders, and the channels to be swept were incorporated in ONWEST TWO.

(b) Basic minesweeping serial orders for British fleet minesweeping flotillas sweeping the four initial assault channels, interconnecting channels and completion of channels 12, 34 and 14 and transport areas 12 and 34 were covered in detail by ON 6, which also included buoy laying. Sweeping of boat lanes, fire support channels and assault and screening areas were assigned numerically in ON 6 and ONWEST TWO, and covered in detail by the two force commanders.

(c) A serious problem, which affected the planning and timing of fleet minesweeping flotillas sweeping the four initial approach channels was the 5-knot speed of assault vessels and landing craft in slow channels 2 and 4. This necessitated a 360° turn-around of the two minesweeper flotillas to lose 90 minutes. A later adjustment of D-day and H-hour and earlier time of arrival in transport areas showed an Easterly set of tidal current from the time of entry of minesweepers in channels 2 and 4 at H - 12 hours until reversal of set at H - 7½ hours when they would be approaching the turning point into the transport areas. The solution of this problem was to shift from port echelon to starboard echelon during the turn-around, and, in order to make a similar shift of echelon for the minesweepers clearing channels 1 and 3, a similar turn-around had to be executed. After rehearsing this turn, it was found necessary to take two hours from H - 9½ to H - 7½ hours. Time of minesweepers entry into the approach channels at latitude 50° 05' N was advanced one-half hour accordingly.

(d) British minesweeper formations "G" and "K" were used for "O" type sweeping, as described in S.P. 02275, Minesweeping Appendix to the Auxiliary Vessels Signal Book, S.P. 02226. Full details of minesweeping operations are given in the following British publications which were followed by the 11 AM and 21 YMS vessels in the force:

O.U. 6350 - Manual of M/S, Volume I.

C.B. 04031 - M/S Manual, Volume II.

C.B. 4136 - Regs. for Maintenance of LL Minesweepers.

(e) Specific instructions for all M/S vessels participating were covered in X.F.M.I. issued 28 April 1944 by ANCXF.

(f) Shallow water minesweeping was expected to be of utmost importance and preparations were made for sweeping snag line mines by means of sisal line sweeps streamed by means of modified diverter (twin) floats from LCTs. About 30 LCTs equipped with this gear were assigned by both assault forces.

(g) Ten rake type anti-boat mine firing units for mounting on LCVPs were ordered but trials in rough water indicated their failure as the frames buckled and broke up prior to arrival of the craft in shallow water.

(h) Two British motor minesweeper flotillas consisting of 10 vessels each were equipped with Size 5 Oropeas gear for sweeping the boat lanes. The Size 5 paravanes and depressors buckled at speeds greater than 6 knots and were replaced by British Mk. 5 "Star" Otters, floats and kites for the assault sweep. These vessels were also used for sweeping in to shallow water where the Size 4 gear of the YMSs could not be used. Sweeping of water in the [redacted] Areas, CARENTAN Estuary, St. VAAST and CHERBOURG Harbors was accomplished by this means together with ten LCVPs similarly equipped.

(i) Many material difficulties developed as a result of late arrival of U.S. minesweepers and S.P.D.C. gear. Mechanical differences between U.S. and British sweep wire, cutters, stops and dan buoys presented problems which were met by cooperative action from British supply sources and dock yard shop facilities.

(j) Training of U.S. minesweepers in formation sweeping for the assault was curtailed to two weeks. Only two AM vessels took part in the training operations for combined forces known as Operations Beaver, Tiger and Fabius. In spite of this disadvantage the results obtained in Operation [redacted] are considered to be excellent. Sweeping through cross-tide currents of over 3 knots was unavoidable and training in this phase using the British Higson-Ellis Station Keeping method was introduced.

III. OPERATION AND EXECUTION OF PLAN.

(a) The execution of the various operation plans, serial orders, and directives was followed according to schedule, except for a few unavoidable changes. A noteworthy example of deviation in the timing was occasioned when the Y1 Squadron suffered a 45-minute delay due to casualties to sweep gear prior to starting sweep of the Force "U" boat lane. This caused interference with the 14th MSF sweeping Fire Support Channel 2 and delayed the start of Fire Support Channel 3.

(b) Support of minesweepers in exposed positions, close to the shoreline was in some areas too distant to furnish protection, or draw enemy fire away from the sweepers, but as this enemy fire was poorly directed, no ship casualties were suffered in this phase of the assault.

(c) Some difficulty was experienced in obtaining reports on completion of sweeping and issuing of orders for subsequent sweeping due to congestion of radio traffic on the single M/S frequency assigned for both Eastern and Western Task Force Areas.

(d) Additional channels were swept after the initial assault dependent on the minefield obstructions which appeared in the progress of sweeping the large areas required.

(e) Dan buoy laying by danlayers during the assault and the laying of A.G.A. and Ocean Light Buoys by T.H. Vessels G. deJoli, Discovery II, and H.M.S. Scott was carried out according to plan.

(f) A summary of mines accounted for by Commander M/S West in the Western Task Force Area from the initial assault until 28 June 1944 was as follows:

By minesweeping

Influence ground mines swept	126
Moored mines swept	78
By casualty with vessel or gear	27
Total	231

IV. CONCLUSIONS AND RECOMMENDATIONS.

(a) That lighted navigational buoys and markers, including those screened from aircraft, should be extinguished when night enemy aircraft minelaying is anticipated.

(b) That all M/S spare gear and replacements, which have been set up for availability at advanced bases, or on supply vessels in assault areas, be sailed in the same convoy with minesweepers which depart from the U.S. for operations away from established bases of supply.

(c) That minesweepers operating with amphibious forces in advanced base areas be organized into unit commands with adequate staffs, capable of administration, operational planning, logistics planning, and supply functions. A senior minesweeping commander, commensurate with the minesweeper forces present should be furnished, independent of amphibious commands.

(d) That AM vessels be equipped as navigational control vessels, and that they have standard smoke generators, bull horsn, davit swung life boat, and adequate dan buoy stowage. That certain AM vessels be especially rigged for accurate danlaying at 10 knots with capacity of 80 dan buoys.

(e) That Size 5 gear be designed to stand the strain of sweeping at 8 knots, and that cutters with light weight metal frames which do not cause excessive sag be made available for this gear.

(f) That explosive cutters be designed with quick-securing device suitable for removal or placement on the wire in complete darkness.

(g) That the special signals for protection of minesweeper formations and gear be promulgated to all combatant vessels and landing craft.

(h) That laying and weighting of dan buoy gear should be understood by other than minesweeping forces in the eventuality that they may be required to use these buoys in assault operations for indicating mines, wrecks, or navigational marks.

(i) The lack of knowledge of minesweeping procedures, equipment and operations exhibited by most naval forces introduces a serious hazard to all vessels from mines and also causes the loss of critical minesweeping gear.

V. COMMENT.

1. The magnitude and intricacy of the minesweeping task for this operation posed a problem upon whose solution depended not only the success of the initial assault but likewise the continued operation of our forces off the beaches.

2. The results achieved were admirable, and reflect the highest credit upon the minesweeping forces.

CHRONOLOGICAL RECORD OF MINES IN WESTERN TASK FORCE ASSAULT AREA

CHART SERIAL NO.	DISPATCH NO.	ORIGINATOR	REMARKS 6 June 1944
(1)	061530B	CTF 125	Suspected mines 49-28N 01-04W.
(2)	122152B	SO M/S F16	Anti-sweep obstructor field.
(3)	060755B	SO 14th M/S F	One mine swept 50-12 N 01-22 W; One mine swept 49-37 N 00-56 W.
(4)	060300B	CTG 125.9	Three mines swept 50-15 N 01-37 W; One mine swept 50-13 N 01-33W One mine swept 49-39 N 00-57 W
	060840B	SO GRP 63	HAMBLETON Sank mine 49-35 N 00-30 W
	060905B	CTU 125.9.3	OSPREY (AM56) mined and sunk 50-12.9 N 01-20.4 W.
(5)	070320B	CTF 124	LCT sunk 2000 yards 360° from St. Honorine des PERTES.
	061149B	SO 1st MSF	11 mines detonated 50-36 N 00-34 W.
(6)	070840B	ANCXF	SUSAN B. ANTHONY damaged 49-31N 00-47W. 1 mine swept 49-37N 00-54 W.
(6a)	061415B	CTG 125.9	
(7)	070910B	SO 6th M/S F	9 mines swept 49-36 N 00-31 W, 7 detonated in sweep.
(8)	071131B	CTF 122	S.B. ANTHONY sunk 49-30 N 00-42 W. USS TIDE (AM125) hit mine 49-27 N 01-04 W.
(9)	071343B	CTG 125.9	Two mines picked up 49-39N 00-56 W.
(10)	071929B	CTF 124	M.T. 233 damaged by mines 49-27-03 N 00-51 W.
(11)	080310B	CTF 125	29 mines, magnetic exploded in boat-lane near pt. Z.
(12)	080620B	CTF 125	30 heavy mines (magnetic) detonated in boat lanes on seaward side of banks by minesweepers June 7 line pattern bearing 315° true from St. Marcouf - time activiation suspected.
(13)	081123B	CTF 125.8	Wrecks of following in positions - coordinated CORRY 448070 (Reference 201123B & 151100B - C.O. CORRY).

CHART SERIAL NO.	DISPATCH NO.	ORIGINATOR	REMARKS
(14)	081630B	COM M/W	Minefield enclosed by following: Bearings and distances from St. Marcouf Island: A. 325°T - 4.7 mi. B. 313°T - 4.8 mi. C. 238 true - 1.6 mi. D. 131 true - 5.0 mi. E. 119 true - 4.8 mi. F. 145 true - 0.7 mi.
(15)	082105B	----------	Minefield enclosed by following points: A. 49-41 N 00-51 W B. 49-41 N 00-48 W C. 49-43 N 00-51 W D. 49-43 N 00-48 W
(15A)	082330B	SO 104 M/S	Elder Area swept Total 4 groundmines.
(16)	061249B	ANCXF	Reported enemy mine barrier "A".
(17)	061249B	ANCXF	Reported enemy mine barrier "B".
(18)	090930B	CTU 125.9.3	Detonated mine 49-34 N 01-08 W. Detonated mine 49-35 N 00-53 W.
(18A)	091010B	MINAS	Detonated mine 142° 4 miles from Ile DuLarg.
(19)	091102B	SO 31st M/S F	Detonated mine 49-27 N 01-05 W.
(20)	091300B	CTU 125.9.3	Detonated mine 49-34 N 01-05 W.
(21)	091430B	CTG 124.9	Fired acoustic mine 1.5 mile 300° from point DU HOE.
(22)	091847B	CTF 122	Mines explosions in vicinity 49-32.3 N 01-11.9 W.
(23)	092105B	CTU 122.4.4	Floating mine destroyed 49031.5N 01-07 W.
(24)	092227B	CTF 124	2 mines dropped by planes in berth No. K1 L2, 1 mile north of Port en Bessin.
(25)	092230B	CTG 122.7	S.S. F.C. HARRINGTON mined 49-29N 00-45 W.
(25A)	092340B	CTF 124	Reported 2 mines dropped 2600 yards 320° from Port-En-Bessin.

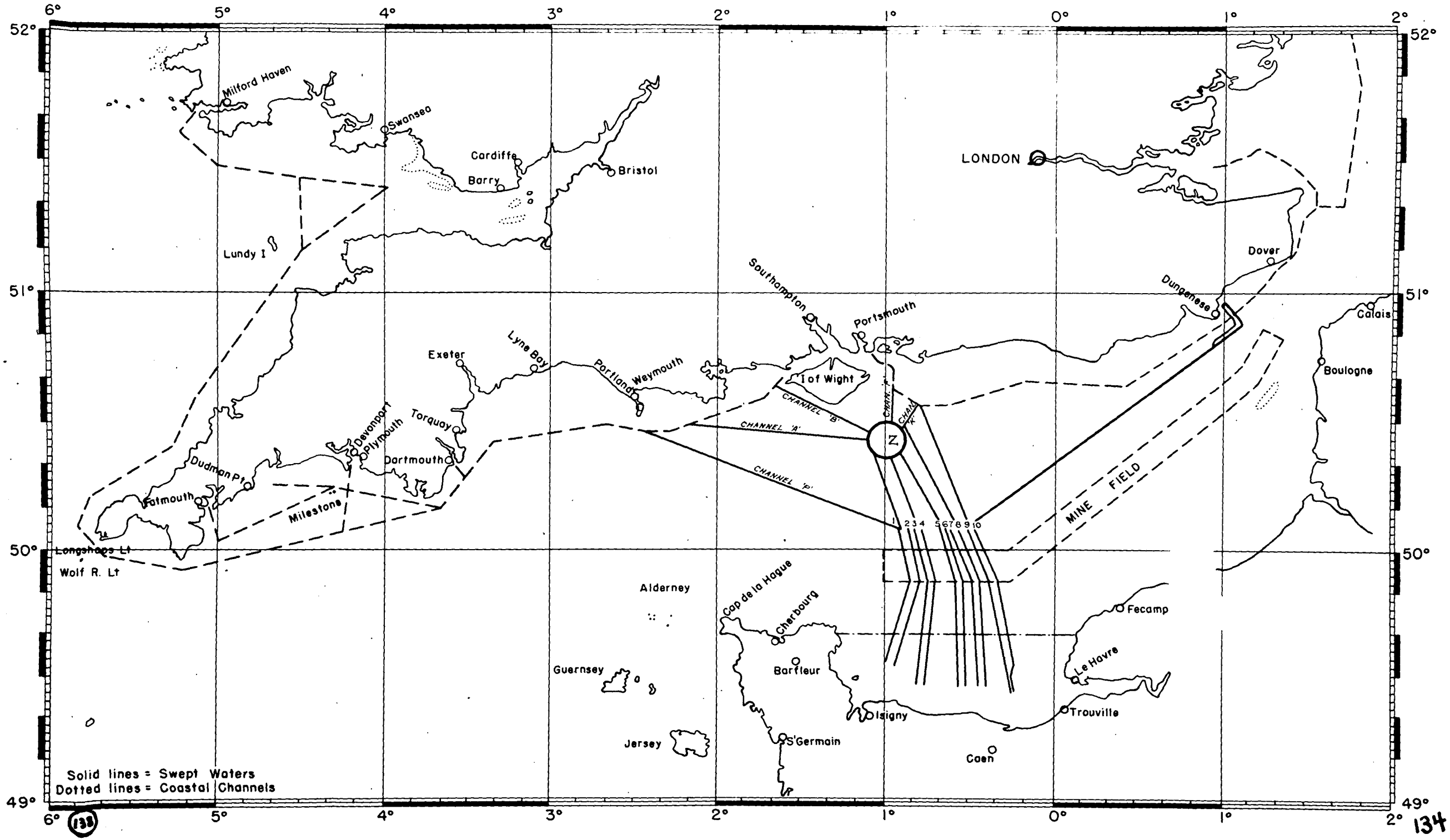
CHART SERIAL NO.	DISPATCH NO.	ORIGINATOR	REMARKS
(26)	100603B	PC 617	Possible 2 mines 1 mile north of station 46 DIXIE Line.
(27)	11-----	CTG 122.4	LST mines position A34.
(27A)	111343B	CTG 125.8	USS GLENNON - sank in position 49-32N 01-11.4W.
(28)	120125B	ComLST Gr 30	LST 496 mined and sunk position 6 to 5 miles 220° from GRANDCAMP Light.
(29)	121440B	CO LST 314	LST 314 torpedoed 9 June position 49-43.5 N 00-53.2 W.
(30)	110903B	NCWTF	MEREDITH was mined 0215 June 8 - towed within screen area, broke up and sunk 49-35 N 01-03 W.
(31)	131510B	LCT Flot 18	Following LCTs damaged by mines and gunfire and obstacles attempting to land on E-red OMAHA LCT 30, 25, 305, 364 and 332.
(32)	132025B	CTF 125	MMS 229 mined on Bane du Cardonnet
(33)	132324B	CTF 125	LCT 967 mined 49-27.8 N 01-05.3 W.
(34)	141130B	LA SURPRISE	Reported mines dropped 49-44 N 00-51 W.
(35)	141254B	LST 376	LST 376 torpedoed 9 June, sunk position 49-43 N 00-53 W.
(36)	151539B	CTF 124	Mines laid in WTF area night 14/15 June A. 49-27-08N 00-46-00W B. 49-26-00N 00-44-02W C. 49-26-00N 00-52-04W D. 49-27-02N 00-53-06W E. 49-26-08N 00-51-00W F. 49-24-00N 00-53-00W G. 49-22-06N 00-51-00W H. 49-27-03N 00-53-05W I. 49-25-00N 00-52-03W J. 49-23-05N 00-53-00W K. 49-22-08N 00-51-07W
(37)	150840B	CTU 125.9.3	Detonated mine position 49-33 N 01-08 W.
(38)	150910B	CTU 125.9.3	Detonated mine position 49-36 N 01-02 W.
	151542B	CTF 122	LST 133 struck mine 49-52.5N 00-46W.

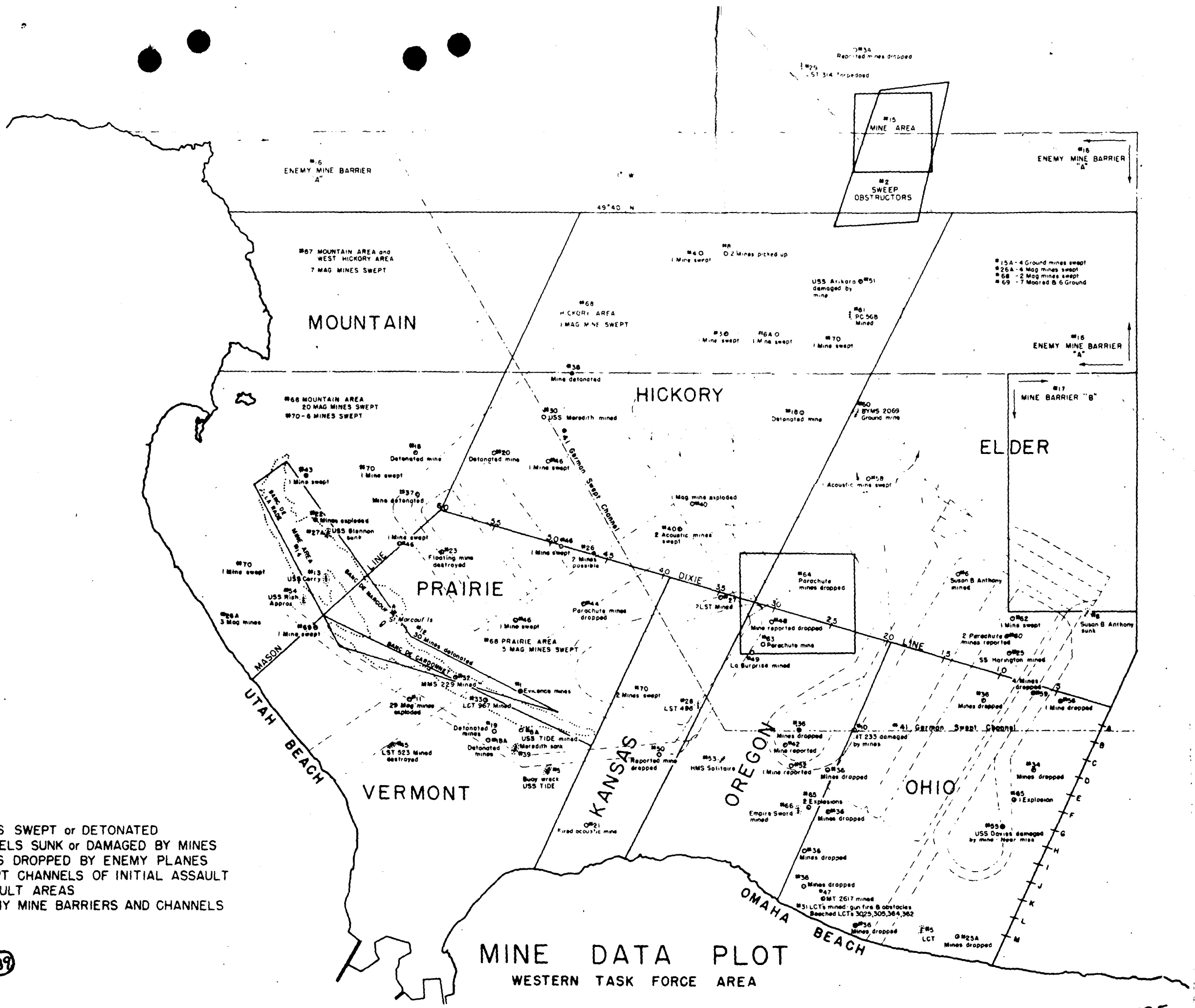
CHART SERIAL NO.	DISPATCH NO.	ORIGINATOR	REMARKS
(39)	161547B	C.O. MEREDITH	MEREDITH struck mine 7 June 49-33.3 N 01-06.3 W, subsequently sank 8 June 49-26.4 N 01-04.3 W.
(40)	161803B	CTU 125.9.3	Completed mag. and acoustic sweep of Fire Support Area and F.S. Channel #1 - 1 mag. mine Blue field 256° 4.8 mi. from Pt. K, 2 acoustic mines 250° 5.25 mi. from Pt. K, Oropesa sweep negative - sweeps made to 12 fathom curve.
(41)			German swept channel reference -----.
(42)	182158B	CTF 124	Mine sighted 49-26-42 N 00-53-43 W.
(43)	182353B	M/S West	1 mine swept 271° 2.3 mi. from posit "N".
(44)	190028B	LCH 269	2 parachute mines dropped 276° 2 mi. from U12.
(45)	191415B	CTF 125	LST 523 destroyed by mine position L 54
(46)	192046B-	M/S West	Mines swept in following area 1 - D48 1 - D49, 1 - B61, 1 - 045° 5.5 mi. from St. Marcouf Tower.
(47)	Mailgram	USS PINTO	Norwegian ship I-671 mined while at anchor position 49-22-40 N 00-52-15 W
(48)	200558B	CTG 122.4	Mine reported dropped in water 500 yds. south of D30 - several explosions in water 1500 yards NE D1.
(49)	201430B	HMS WHIMBRED	LA SURPRISE damaged by mine in position 49-29-00 N 00-55-00 W - being towed to UK.
(50)	210915B	CTG 127.2	LST 288 reports mine dropped 40-26-23 N. 00-58.6 W.
(51)	211631B	CTF 124	USS ARIKARA damaged by underwater explosion probably mine near 14F Buoy bearing 012 2000 yards.
(52)	212148	Garbled	1 mine reported in position 49-26.1 N 00-53.5 W.

CHART SERIAL NO.	DISPATCH NO.	ORIGINATOR	REMARKS
(53)	212316B	CTF 124	HMS SOLITAIRE sunk 49-26-15 N 00-56-18 W.
(54)	081123B	CTG 125.8	USS RICH sunk coordinates 442068.
(55)	220145B	CO DAVIES	At 212150B from USS DAVIES - mine detonated close aboard to port - slight damage; in G4.
(56)	220540B	CTF 124	Ship mined yesterday 2000 yards 013° True from 14 F buoy. Mine also dropped 49-27-45 N 00-43-00 W.
(57)	231400B	CTF 125	USS TIDE wreck marked by Dan buoy 49-26-02 N 01-03-01 W.
(58)	251932	M/S West	Acoustic mine swept bearing 061° 1.8 mi. from 14 G buoy.
(59)	290110B	CDD34	2 parachutes mines reported 2000 yds north D9 4 mines dropped 1000 yds west of D5.
(60)	290810B	BYMS 2182	BYMS 2069 mined by ground mine in position 49-35 N 00-51 W.
(61)	291235	CTF 122	At 290343B PC 568 mined on A/S patrol. Near 14F Buoy. At 290810B BYMS mined by ground mine bearing 175° 2.5 miles from 14F buoy.
	291616B	SO 132 M/S	Detonated Acoustic mine 49.26.57 N. 00° - 55 - 56 W.
(62)	302344B	Capt. MS/W	1 Mine swept Position 074°T 6.4 mi. from Kansas lightship.
(63)	302358B	CERES	Parachute mine dropped 010°T 5000 yds from CERES.
			JULY 1944
(64)	010117B	CTG 122.7	Parachute mines fell center channel 14D line between 49-29 N 49-31.5 N and 00.51 W and 00-55.5 W.
(65)	011343B	CTF 122	3 heavy underwater explosions at 1315/1 2 at Item 20 one at Fox 4.
(66)	031011B	CTF 125	EMPIRE SWORD mined and sunk vicinity L5 buoy MMS 1019 mined between H10, YMS 350 mined (acoustic) while sweeping to seaward of detached breakwater CHERBOURG.

CHART SERIAL NO.	DISPATCH NO.	ORIGINATOR	REMARKS
(67)	100130B	Capt. M/S West	Swept 7 mag. mines in West Hickory and Mountain Area.
(68)	140005B	CTF 125	Mines swept in following areas - Total ELDER 71 moored 6 ground. 1 Red ground mine swept 260° - 2 mi. from St. Marcouf Isle.
(69)	120025B	Capt M/S West	Mines swept in following areas: Mountain 1, magnetic, on Bane De La Rade, Prairie 5 magnetic on Bane de Marcout, Elder 2 magnetic Hickory One magnetic.
(70)	152314	CTF 125	Mines swept following Areas. 1 Mine near 14F Buoy. Utah Anchorage 2 Mines, Fire Support Channel #3 and Shoal 1 Mine Fire Support Channel #1 and Fire Support Area #1 and Area Mountain 6 mines.

CHART of ASSAULT ROUTES





MINES SWEPT or DETONATED
VESSELS SUNK or DAMAGED BY MINES
MINES DROPPED BY ENEMY PLANES
SWEPT CHANNELS OF INITIAL ASSAULT
ASSAULT AREAS
ENEMY MINE BARRIERS AND CHANNELS

(139)

MINE DATA PLOT

WESTERN TASK FORCE AREA

NAVAL GUNFIRE SUPPORT

Reference: (ANNEX D to CTF 122 Op Plan 2-44 - Gunfire Support Plan)

I. GENERAL.

The initial estimate of combatant ships required for the Western Task Force was made in December 1943 as follows:

2 Battleships	18 Submarine Chasers
6 Light Cruisers	12 Mine Sweepers (AMs)
48 Destroyers	12 Mine Sweepers (YMs)
8 Old Destroyers	12 Motor Torpedo Boats
12 Patrol Craft	

In February 1944 requirements for fire support only were estimated by Allied Naval Commander Expeditionary Force as follows:

3 Battleships
2 Heavy Cruisers
8 Light Cruisers
36 Destroyers

This estimate was based upon the strength of coastal defenses and upon the scheme of maneuver of the FIRST U.S. Army. By D-day the known coastal batteries had increased in number and in strength as many batteries were placed in concrete casements. However, an increased air bombing effort was available to assist in neutralizing both the coastal batteries and the beach defenses.

Late in February the following British warships were designated for allocation to the Western Task Force:

RAMILLIES	BELLONA
EREBUS	ENTERPRISE
GLASGOW	HAWKINS
AJAX	12 Fleet Destroyers
DIDO	4 Hunt Destroyers
BLACK PRINCE	

Upon assignment of U.S. warships to the Western Task Force certain British warships were detached and the final assignment of fire support ships to the Assault Forces of the Western Task Force was as follows:

Assault Force "O"	ARKANSAS	GLASGOW
	TEXAS	MONTCALM (Fr.)
	DESRON 18	GEORGES LEYGUES (Fr.)
	(Total DD's 9)	2 Hunt Destroyers.

Assault Force "U"	NEVADA	ENTERPRISE
	EREBUS	SOEMBA (Dutch)
	QUINCY	DESDIV 54
	TUSCALOOSA	DESDIV 20
	HAWKINS	(Total DD's 8)
	BLACK PRINCE	

A reserve fire support group was constituted to relieve ships which had severe battle damage or had depleted their ammunition. This group consisted of AUGUSTA (WNTF Flagship), BELLONA, DESDIV 55, plus PLUNKETT, DESDIV 119 And DESDIV 18. (Total DD's 17)

II. PREPARATION

The TEXAS and AUGUSTA arrived in this theatre 15 April 1944. NEVADA, ARKANSAS, TUSCALOOSA and Destroyer Squadron 18 arrived in 26 April and the remainder of the destroyers arrived during May. Full utilization was made of the short time available for training. All ships were exercised in Naval Gunfire Support at the Bombardment ranges at Kintyre, Scotland, and Slapton Sands, Devon.

III. EXECUTION.

1. Prearranged Fires.

Fire support ships made the approach to the assault area with the fast assault convoys. Fire support channels were swept inshore of the transport area for fire support ships. Enemy coastal batteries commenced firing sporadically about 0535. At 0550 the prearranged bombardment of beach defenses and coastal defenses began with all available ships and spotting planes. This period of bombardment was extremely heavy, but was of too short duration to silence or neutralize all the defenses particularly in the OMAHA area where the defenses were strong and well-protected. Destroyers and heavier ships continued to deliver direct fire on the OMAHA beaches after H-hour, some destroyers closing the beach to within 800 yards in certain cases.

2. Call Fires.

Naval gunfire support was delivered in support of the Army from D-day on until the troops had advanced inland beyond the range of naval gunfire. Counter-battery fire was continued for several days after D-day on three coastal batteries in concrete casemates north of UTAH Beach, which came to life from time to time and required daily neutralization. On June 25 a force consisting of NEVADA, TEXAS, ARKANSAS, QUINCY, TUSCALOOSA, GLASGOW, ENTERPRISE and

escorting destroyers made an approach along the Cherbourg Peninsula for the purpose of delivering naval gunfire support to units of the VII U.S. Army Corps advancing on Cherbourg. The ships were under extremely heavy fire from coast defense batteries for 3 hours. Effective naval gunfire support was delivered as requested by Shore Fire Control Parties and counter-battery fire was kept up during the entire time with air and ship spot. It is not practicable to state how much this bombardment was a contributing factor in the fall of Cherbourg. The fire had been requested by the Army and was delivered, and it was reported that 19 of 21 batteries in the area were neutralized.

IV. SHORE FIRE CONTROL PARTIES.

1. Twenty-seven Shore Fire Control Parties were organized and equipped and nine were assigned to each assault infantry division, the 1st Division, 4th Division, and the 29th Division. Nine naval gunfire spotting teams, consisting of 1 Army paratroop officer and 2 enlisted men were dropped by parachute with the 101st Airborne Division. The personnel of each Shore Fire Control Party was increased to two officers, 1 Army officer, 1 Navy officer and twelve enlisted men. Each party was supplied with two (2) SCR 609, a frequency modulated set, in addition to normal equipment. In order to communicate on this channel each fire support ship, U.S. and Allied, except the late arrivals, was equipped with an SCR 608. This SCR 608/609 channel proved most effective and added to the flexibility of fire support communications. A Naval Gunfire Liaison Officer was assigned to each Field Artillery Battalion Fire Direction Center in order to direct the activities of the three Shore Fire Control Parties in his sector. In addition a Naval Gunfire Liaison Officer was assigned to each Division Artillery Headquarters in charge of all Shore Fire Control Parties in the division.

2. Prior to the assault every Shore Fire Control Party conducted a shore bombardment practice with its assigned fire support ship and held conferences onboard with gunnery and communication personnel. Shore Fire Control Party composed of naval personnel were permanently based at each bombardment range to conduct shore bombardment practices and proved invaluable in the training program.

V. AMMUNITION.

1. Supply.

Arrangements were made with the Admiralty for afloat

stowage in lighters and ammunition ships of the majority of large caliber ammunition so that it would be readily available to reammunition fire support ships. Generally one refill of main battery ammunition was available for battleships and destroyers and two refills for cruisers. 14-inch, 12-inch, 8-inch and 5-inch were held in Plymouth, and 8-inch and 5-inch in Portland and Southampton. USS NITRO carried the majority of the ammunition in Plymouth. Quick reammunitioning was accomplished in all cases and USS NEVADA main battery was reammunitioned in 20 hours. Small caliber ammunition for landing craft was available at all bases on the southcoast and some AA ammunition, depth charges and smoke material was carried to the assault area in small Admiralty ammunition ships. During the assault as fire support destroyers expended ammunition they were replaced by destroyers from the screen.

2. Expenditures.

	15"	14"		12"		8"		6"		7.5"		5.25"			
	HC	AP	HC	AP	HC	AP	HC	AP	HC	AP	HC	AP	HC	5"	4"
WARSPITE	60														
EREBUS	41														
NEVADA		260	1048											4498	
TEXAS		248	442											272	
ARKANSAS				163	656									94	
QUINCY						70	1743							935	
TUSCALOOSA						98	1051							118	
AUGUSTA							68								
GLASGOW									1586						
ENTERPRISE								362	2308						
HAWKINS										1200					
MONTCALM								236	506						
GEORGE LEYGUES								466	614						
BELLONA													275		
BLACK PRINCE												65	1198		
SOEMBA									400						
ELLYSON														436	
EMMONS														914	
HAMBLETON														8	
RODMAN														0	
FORREST														513	
FITCH														834	
CORRY														---	
HOBSON														1028	
PLUNKETT														460	
NELSON														0	
MURPHY														4	
GLENNON														---	
JEFFERS														820	
BUTLER														1075	
GHERARDI														1015	
HERNDON														973	
SHUBRICK														343	

	5"
FRANKFORD	1127
CORMICK	739
DOYLE	---
ENDICOTT	1099
MC COOK	1031
THOMPSON	---
BALDWIN	1087
HARDING	1007
SATTERLEE	1165
BARTON	457
WALKE	850
LAFFEY	1169
OBRIEN	206
MEREDITH	12
SOMERS	208
DAVIS	30
JOVETT	0
MELBREAK	1000
TUNATSIDE	1000
TALYBONT	1000

TOTALS

15-Inch	101 H.C.				
14-Inch	508 A.P. 1490 H.C.				
12-Inch	163 A.P. 656 H.C.				
8-Inch	168 A.P. 2862 H.C.				
6-Inch	1064 A.P. 5414 H.C.				
7.5-Inch	1200 H.C.				
5.25-Inch	65 A.P. 1473 H.C.				
5.38-Inch	25707		5.51-Inch	376	
5.25-Inch	118		4-Inch	3000	

3. Performance.

All ammunition, ordnance material and fire control equipment performed well. Although many ships fired continuously for long periods of time only minor casualties resulted.

VI. RECOMMENDATIONS.

1. Longer periods of preparation bombardment with deliberate fire at long and close range are required to effectively reduce strong enemy coastal and beach defenses.

2. Heavy air bombing of enemy strong points should be accomplished prior to the assault.

3. Aircraft capable of remaining on station for at least 2 or 3 hours and capable of low altitude flying to search for targets of opportunity are required for efficient air spotting. Carrier based and land based groups should be especially trained in spotting naval gunfire for amphibious operations.

4. Photographic coverage and interpretation, which was excellent in this operation, is of paramount importance and should be continued.

5. Frequency modulated radios functioned effectively on this operation and it is recommended that SCR 608 be standard equipment for fire support ships and SCR 609 for Shore Fire Control Parties.

VII. CONCLUSIONS.

1. That the naval gunfire plans were sound, realistic, and effectively carried out.

2. That the effect of naval gunfire on coast and beach defenses was a major factor in enabling the troops to land and start their advance inland.

3. That efficient air spot and deliberate fire over a long period are required to neutralize or destroy concrete batteries or strong points.

AREA SCREEN

The Area Screen, organized as a defense for ships and craft in the vicinity of the beaches against E-boats, U-boats and enemy DDs, functioned according to plan.

Due to the fact that additional destroyers were assigned to Task Force ONE TWO TWO just prior to the operation, it was possible to release two-thirds of the PCs from duty in the Screen to carry out control vessel duties off the beaches.

Initially the picket line, composed of DDs, PCs and SGBs, was formed along the DIXIE Line and connected at its eastern end with the outer defense line of the Eastern Task Force. The pickets were supported by DDs in pairs or in company with MTBs. Along the MASON Line there were counter attack divisions of PT boats. To avoid being confused with enemy craft all PTs, MTBs and SGBs remained in assigned stations at low speed except when enemy contact developed. They were continuously plotted by radar and coached into position by designated destroyers.

The first enemy attempts to enter the Assault Area were made by E-boats or German coastal craft during the hours of darkness by approaching close inshore down the Cherbourg Peninsula. These craft were picked up on radar by destroyers in the picket line at ranges of ten to twelve thousand yards and taken under fire. The enemy always approached at low speed, sometimes stopping when illuminated, but always withdrew in the face of destroyer gunfire. The Screen was never penetrated but it is probable that the enemy laid mines on these sorties.

On the night of D / 3 enemy craft endeavored to pierce the Screen from approach positions north of the DIXIE Line. These attempts were repulsed.

Subsequently in order to cut off E-boats which were passing near Pointe de Barfleur two attack units of SGBs and PTs were stationed in MOUNTAIN AREA and were vectored into positions for counter attack by destroyer radar. Although these units made no known kills of enemy E-boats, their presence and aggressive attitude are considered partly responsible for the fact that no serious threat was again made against the Screen.

Shortly after the assault, convoys and miscellaneous ships often arrived at the assault area during darkness without previous notice. It was difficult for Pickets to recognize these ships as friendly and in one instance, on 13 June, the British cable layer MURDAUGH MONARCH, was fired upon by USS PLUNKETT.

ANNEX J - AREA SCREEN

In addition to their screening functions the Pickets were useful in reporting mines laid by aircraft, in estinguishing floating flares dropped by aircraft and in the warning they gave of impending air attacks.

USE OF PT BOATS

PTs arriving from the U.S. were based at Portland. MTBRons 30 and 34 did not arrive at their base till 7 June and reported that date to NCWTF. These squadrons were employed as relief for PTRon 2 and 35 under a rotating system.

PTs used in the initial assault acted as escort vessels for the minesweepers of Force "U" and subsequently were employed by the Area Screen Commander for general duties which included:

(1) Anti E-boat patrol.

(2) Counter attack units.

(3) Shooting out flares which were dropped by aircraft.

Aside from the above, PTs were utilized as fast dispatch boats. When Cherbourg was captured, they were placed on a nightly patrol on a line 49° 46' N 01-40 W to 01-13 W. Attack units consisting of PTs and SGB also were stationed north of the DIXIE Line and in the vicinity of the swept channels in order to take offensive action against "E" Boats which attempted "End Run" Tactics; after their original sorties against the Screen had proven fruitless.

After D / 1 PTs were fuelled in the assault area by LBOs, thereby eliminating the necessity of returning to the U.K.

For the tasks assigned them the PTs were very satisfactory.

SMOKE REPORT

During the initial planning stage of Operation [redacted] much consideration was given to the large number of vessels and craft that were to be crowded into a limited sea area. In anticipation of this condition and the attendant difficulties in coordinating ships and craft movements during the attack by enemy sea and air forces, elaborate smoke plans were prepared.

Many ships and craft not ordinarily equipped to make smoke were especially fitted for this operation. This group included LCP(L)s, Fishing Trawlers, PCs, AMs, etc.

LCP(L) smoke laying craft were provided for each of the assault forces. These craft, equipped with smoke racks designed to hold four (4) Mark 3 smoke pots were assigned a dual role: (a) to screen the flanks of the assault waves, and (b) to furnish cover for the transport area from sunset until sunrise, if required. To meet this smoke requirement 46,000 #24 H.C. smoke generators (British equivalent of the Mk. 3 H.C. smoke generator) were procured. In connection with equipping these craft, an anti-glare shield was designed to hide the flames omitted by the #24 generator. The shield, while adequate, should be improved and standardized.

Specially fitted Fishing Trawlers equipped with Esso Fog oil generators were made available to the assault forces. These vessels were provided to furnish smoke cover for the [redacted] and [redacted] A.

In addition to the various seaborne smoke sources mentioned, twenty (20) Douglas A20 attack bombers equipped with F.S. smoke tanks were made available to the navy for prearranged smoke missions. Plans for frontal and flanking screens to be executed by these aircraft were evolved by each force. These plans were to be put into effect on signal by the Assault Force Commander prior to H-hour, and to be executed upon approval of the air force commander.

During the training phase, efforts were concentrated on LCP(L) and LCS(S) crews. Much excellent training had been given previously by ComPhibTrainLant to LCS(S) crews, who arrived from the U.S.

The operation presented little opportunity to use the many prescribed smoke plans. In the assault phase, Force "U" requested an aerial smoke screen be laid on the Western Flank of the Assault Area to screen this transport area from heavy enemy coastal guns. The Air Force executed this mission promptly and efficiently. Force "U" also employed smoke in the transport

area during night air attacks and reported favorable results. It is interesting to note that it took approximately ten (10) minutes following the order "Make Smoke" for a good cover to develope.

Smoke again proved its value in subsequent minesweeping and naval bombardment operations in the Cherbourg area. Throughout these operations, which were carried out in restricted waters, smoke was used advantageously to provide cover under which sweeping and bombarding forces could retire from heavy enemy fire which they encountered. 5"/38 W.P. projectiles were also effectively used.

CONCLUSIONS

(a) Although smoke was not extensively used, it is believed that carefully prescribed smoke plans should be included in all amphibious operation orders.

(b) The Air Force proved its ability to lay a prearranged flank screen in support of a landing operation.

(c) Anti-glare shields as developed to guard flame from British #24 and Mk. 5 H.C. smoke generators need improving.

(d) Sufficient warning must be had of approaching aircraft in order to develop an efficient area screen - approximately ten minutes.

CONTROL VESSELS

It was necessary during most of the training period to use LCCs and AMs as control vessels although they were not entirely satisfactory. When a large number of PCs were assigned this Force about one month prior to D-day, these craft, due to their shallow draft and navigational equipment, were ultimately used as the Primary and Secondary Control vessels and proved invaluable.

The assault and landing of the initial waves went according to plan. One PC was sunk by enemy gunfire and mines during the assault.

The plan called for the PCs to report to the Area Screen Commander after the initial assault. However, due to the demand for craft to control traffic, this was not carried out in total. Eight PCs were sent to the screen and the remainder were retained for control duties off the beaches.

These PCs plus SCs and subsequently coast guard cutters were used to great advantage during the days of rough weather, when convoys were still coming in, to keep traffic moving and perform rescue and minor salvage work.

NAVAL SCOUT BOAT

I. TRAINING.

In order to familiarize crews with current and tidal conditions anticipated off the Normandy coast, a Scout School was set up aboard an LST. Officers and crews of LCS(S)s were trained by the scouts in recognition of coastline silhouettes and recognition of landmarks.

II. OPERATION

The primary duty of the Naval Scouts used in the operation was to lead the first assault waves and DD Sherman Tanks into the beach, then lend close rocket and fire support to the troops as they landed and deployed over the beach. In several instances the Scout Boat upon completion of duty took over the functions of control vessels in directing landing craft to gaps which were blown through obstacles; others acted as traffic control boats or when called upon did hydrographic survey work.

III. SUMMARY.

It is felt that the work of the Naval Scouts was excellent.

BEACH AND UNDERWATER OBSTACLES

During the initial planning stage of Operation [redacted] the Beach and Underwater Obstacle problem did not appear to be serious. Aerial photographs made about the middle of February indicated that the enemy had begun reinforcing his beach defenses in the area of our assigned assault beaches.

Training was begun and all demolition units were trained on the basis of the intelligence data and aerial photographs of the beaches. Obstacles similar to those shown in the aerial photographs were constructed and all demolition units were trained in several methods of removal. All units were trained on both wet and dry obstacles.

The operation orders and methods of employment of the demolition units were written by the assault forces.

Thirty-two (32) Naval Combat Demolition Units were employed in Operation [redacted] Eleven (11) units were assigned to Force "U" at UTAH beaches and twenty-one (21) units divided into two groups were assigned Force "O" at OMAHA beaches.

Considerable opposition was encounted by and heavy casualties inflicted upon the demolition units at OMAHA beaches. Despite casualties the mission of clearing gaps in the obstacles was carried out, but at a slower rate. All obstacles were cleared from the beach by the evening of D + 3 days.

Slight opposition was encountered on the UTAH beaches which enabled the Demolition Units in this area to work very fast. Casualties to the units on UTAH beaches were light and their mission was carried out satisfactorily in a very short time.

The breaching of Beach and Underwater Obstacles is covered in detail in the Reports of the Assault Force Commanders and in the special report of Lieutenant (jg) Blackwell, USNR. (Enclosure (A) to CTF 122 Serial 844 of 19 July 1944).

CONCLUSION.

Removal of underwater obstacles by hand placed charges is practicable as shown by this operation, but personnel losses will be commensurate with the opposition encountered.

RECOMMENDATIONS

(a) Research and development should be continued with a view of finding methods of removing underwater obstacles by other means than hand-placed charges.

ANNEX N - BEACH AND UNDERWATER OBSTACLES

(b) That development of aerial bombardment of gaps through beach obstacles be continued.

(c) That the Naval Combat Demolition Units used in this operation be kept in contact for use in future operations.

(d) That gap marking be given further consideration and assigned as a duty of the beach party.

(e) That the Naval Demolition Units, the gunfire support covering them, together with the assault infantry, should conduct exercises as a team; and future plans be made to have all the above elements function at the same time on the same beaches in support of each other. That the development of ramming obstacles with specially fitted landing craft be continued. That tank dozers be assigned to Naval Combat Demolitions teams. That demolition units be organized into groups with regular assigned Commanding Officer and necessary assistants.

BEACH AND SHORE PARTY

I. GENERAL.

1. Three Beach Battalions were assigned for this operation: 2nd, 6th and 7th Beach Battalions. FIRST U.S. Army organized three Engineer Special Brigades and one Beach Battalion was attached to each Engineer Special Brigade.

II. PREPARATION

1. The Beach Battalions were assigned and bivouaced with the Engineer Special Brigades. Joint training was conducted and joint training exercises and rehearsals were held. Every opportunity was taken for elements of Beach Battalions and Engineers Brigades to take part in RCT and Division exercises with the Army units with which they were to operate in the assault.

III. OPERATION.

1. The 1st Engineer Special Brigade with the 2nd Beach Battalion attached, landed on beach UTAH in support of the VII Corps (4th Division). Two-thirds of the 5th Engineer Special Brigade with two-thirds of the 6th Beach Battalion attached and one-third of the 6th Engineer Special Brigade with one-third of the 7th Beach Battalion attached landed on beach OMAHA in support of the V Corps (1st and 29th Divisions). The remainder of the Brigades and Beach Battalions landed with the first follow-up force on the afternoon of D-day. On D + 2 day a special organization previously established, NOIC OMAHA and NOIC UTAH; landed and assumed control of unloading in conjunction with the Commanding General of the Engineer Shore Brigades. Lessons learned from previous operations were applied with the result that Beach Battalions functioned well and the beach organization functioned more smoothly than reported in any previous operations. By D + 1 day the UTAH beach was thoroughly organized and supplies were being unloaded expeditiously. The OMAHA beaches were operating efficiently by D + 2 day.

SURPRISE - D DAY AND H HOUR

It was assumed from the outset that a high degree of surprise would be difficult to obtain for the following reasons:

(a) The large concentration of landing craft and ships in a limited number of ports within easy reconnaissance range.

(b) The comparatively few beaches satisfactory for an amphibious landing within range of fighter cover.

(c) The recognized need for the capture of a port of considerable size early in the operation.

(d) The need for a concentrated and sustained aerial bombardment of the enemy's lines of communications and coastal defenses.

(e) The early movement which would be required of the slow landing craft, which it was necessary to disperse over a considerable area.

(f) The short period of darkness with which to conceal these movements.

(g) The requirement of minesweepers to precede the movement sufficiently to sweep transport and fire-support areas prior to the arrival of those ships.

(h) The desirability of conducting an intense aerial bombardment of coastal defenses and strong points just prior to the landing.

(i) The need for employment of airborne troops sufficiently in advance of the landing to secure exits through flooded areas in the rear of beach UTAH.

(j) The choice of a daylight H hour to permit accurate gunfire-support and neutralization of beach defenses and the removal of beach obstacles.

— Measures taken to deceive the enemy concerning our intentions were:

(a) A delay in the final assembly of ships and craft until the last moment.

(b) The bombardment by air prior to D day covered the various areas which were favorable to assault.

(c) A cover plan was implemented as early as D-30 and maintained as a threat to the Pas de Calais Area.

(d) Slow convoys were routed as coastwise traffic insofar as possible.

(e) Ships and craft which would enter the assault area early were fitted with radar jamming gear.

(f) Diversional forces, fitted with special radar devices, were mounted on each flank. These forces were to have the effect of delaying the enemy shifting static troops from these areas to the assault area.

(g) The choice of H hour as near daylight as possible, while still permitting enough light for accurate air and fire support and time of tidal rise for removal of obstacles while still clear of the water.

It is believed that the measures taken were effective and that actually a good deal of surprise was attained both as to time and local areas of assault. So far as is known there was no interference with the movement. The assembly and approach of assault waves was not molested until coming within range of the actual beach defenses.

X

H-HOUR AND D-DAY

The selection of H-hour and D-day was made to meet many requirements:

(a) The night before D day to be a reasonably light one so that convoys could be properly formed and have sufficient visibility at night to keep station with ship darkened. Air-borne operations also required this, necessitating choosing a night on which the moon would be full or nearly so.

(b) H-Hour to be fixed so that there would be a period of about one hour of daylight before initial landings to enable bombarding ships to neutralize enemy batteries and drench the landing beaches.

(c) H-Hour to be sufficiently before high water in order to permit the demolition parties to remove beach obstacles while still dry.

(d) H-hour to be sufficiently after low water in order to permit the landing on certain British beaches to avoid bad ground which existed until 2 or 3 hours of flood tide.

(e) H-Hour to be timed to permit of a second high water in daylight on D-day to permit the maximum discharge during this period.

(f) The only dates on which all these factors were available were May 21-22-23, June 5-6-7, June 19-20-21, July 3-4-5, etc.

DIVERSIONS

Prior to the assault there were three (3) diversionary attacks of which two (2) were under British operational control. These attacks were designed to:

(1) Cause the enemy to delay the movement of his military reserves to meet an incoming force.

(2) To involve a naval action during the night of D-1/D-day which would draw the enemy naval opposition from our assault and follow-up forces.

Operation [redacted] Under the command of Vice Admiral DOVER a special force of 6 H.D.M.L., with air cover, were to make a feint at the beaches in the Pas De Calais area. This feint was to occur at approximately the same time as the assault.

Operation [redacted] Under the command of Vice Admiral DOVER another special force of eight H.D.M.L., with air cover, were to make a feint, at approximately the same time as the the assault, off the beaches outside Cap Antifer.

Operation [redacted] Under the command of Naval Commander Force "U", CinC PLYMOUTH furnished four H.D.M.L. to operate on the western flank of the assault to occupy the attention of enemy radar stations situated in the North East COTENTIN by the use of radar counter measures.

In addition to these three operations there was one other pre D-day operation. Operation [redacted], see Mine Laying Report, was an overall mine laying operation which took place day by day for several weeks prior to the assault.

After the assault there was one further diversionary feint. On the night of 12 June HMCS HAIDA and HMCS HURON swept to the entrance of ROCHES DOUVRES in an attempt to make the enemy think a landing was to be made in that area. Radio transmissions were carried out. This brought on enemy pyrotechnics which were seen in the vicinity of St. Malo and on the west side of the COTENTIN Peninsula.

X

COVERING FORCES

Cover for the operation was provided, according to plan, by the British Home Commands of Plymouth, Portsmouth and Dover. These commands had at their disposal DDs, MTBs, and other coastal craft and aircraft with which they provided cover against sorties of enemy DDs, E-boats, U-boats and W-boats in the channel outside the Assault Area.

Cover against sorties by major enemy units was provided by the Home Fleet basing at Scapa and the Clyde, but it was not required.

The Assault Area initially was limited to the Bay of the Seine south of latitude 49-40. Outside this area the Home Commands maintained anti U-boat air patrol by day and destroyers and MTBs on patrol at night. In addition there were some coastal aircraft equipped with Leigh lights on patrol during darkness across lanes of probable enemy sorties.

The disposition of the channel covering forces varied from night to night. Commander-in-Chief, Portsmouth, issued a daily despatch giving the stations for these forces for the ensuing dark period, identifying the stations by sectors on special channel overprinted charts issued for the operation.

Generally the channel covering forces consisted of the following:

(1) Plymouth Command - four to six DDs and six to eight MTBs.

(2) Portsmouth Command - four DDs and four to six MTBs.

(3) Dover Command - four DDs and eight to ten MTBs.

The Plymouth covering forces, assisted by radar stations in the United Kingdom, repulsed an enemy destroyer sortie of three (3) Narviks and one (1) Elbing in the early morning of 9 June, destroying one (1) enemy DD and forcing another to beach. Except for that one sortie, their enemy contacts on the Western flank were all with E-boats or W-boats.

The strength of the covering forces was not adequate to provide impenetrable cover for the cross channel routes, but it kept enemy activity to a minimum.

ANNEX R - COVERING FORCES

When forces of the Home Commands were stationed near the Assault Area boundary, the danger of conflict with units of WNTF Area Screen was a difficulty which was overcome by prohibiting either of these allied forces from crossing the Assault Area boundary. Direct communication between the screening and covering forces was impractical due to their limited equipment.

When the Assault Area was extended to include the entrances to Cherbourg, a measure of cooperation between screening and covering forces was provided by having DDs of each force guard the radio frequency of the other force.

From the viewpoint of NCWTF the lack of direct communications with units of the covering force was a source of anxiety. There was considerable time lag between the origin of action reports of the covering forces and the time of their receipt in the flagship. There was also considerable time lag in the receipt of the channel disposition despatches. This made coordination of tactical effort between the Home Commands and the NCWTF generally impracticable.

ASSEMBLY AND LOADING

The problem involved was to assemble and load all the ships and craft of Forces "O", "U" and "B" in the following ports assigned the Western Task Force: Poole, Portland, Weymouth, Torquay, Brixham, Dartmouth, Salcombe, Plymouth, Fowey, and Falmouth/Helford.

All but two of these ports are very small, have a large range of tide, and small and tortuous channels. Salcombe, Fowey and Helford have no loading facilities.

The road networks serving many of the ports were bad and in many cases only permitted of one way traffic.

All the ports were very congested and every available mooring and berth was occupied. This necessitated a very careful timing of loading, and movement between ports, of loaded and unloaded ships and craft, plus the additional final assembly of convoys.

The Royal Navy had constructed, prior to our arrival in the country, a number of "Hards" or loading ramps and these proved invaluable.

Numerous exercises were carried out at the Hards to establish loading time-tables for the various types of craft and ships and equipment to be loaded, which enabled an accurate time-table of pre-loading to be completed. In several large scale landing exercises this loading schedule was tested and modified.

The final loading time-table worked smoothly, and in spite of the extensive movements of ships and craft required, and the bad road network, no ships and craft required a pre-loading time of more than 48 hours. Had there not been a postponement of 24 hours, troops would not have been embarked for an excessive length of time.

Although the loading worked smoothly and according to schedule, a number of last minute alterations to the schedule could have been avoided, if the Army loading tables had been matched with the Navy tables at an earlier date. Fluctuations in availability of lift was a partial cause.

In any similar operation, Hards should be constructed, similar to those prepared by the Royal Navy, and more attention paid to improving the road network behind the Hards.

Army loading tables should be adjusted with the Navy, and the final schedule promulgated by D - 20. This would obviate last minute movement and regrouping of ships and craft.

ANNEX S1 - ASSEMBLY AND LOADING

POSTPONEMENT

There were two types of postponement:

(a) For a period of 24 or 48 hours.

(b) For a period of approximately 14 days to the next suitable tidal and lunar period.

For the shorter period, due to the early sortie required of some slow convoys, little could be done other than to consume the time by backtracking, taking advantage of such sheltered water as could be reached. For the longer period ships and craft were to return to assembly points, and personnel disembarked.

Fortunately, although a postponement was required, it was only for 24 hours. About 0700 4 June, D day was changed from 5 to 6 June. Many of the Force "U" slow convoys were enroute and some had proceeded for 15 hours or more. These convoys were turned about and found shelter in Weymouth Bay during the night of 4-5 June. Several Force "B" slow convoys had not been long enroute and returned to assembly points.

Although there was considerable congestion in the Portland-Weymouth Area, slow convoys of Force "O" and "U" were sortied from this area in the early morning of 5 June with a minimum of interference.

CONVOYS, ROUTING AND ESCORT

I. ROUTING

With one exception, established coastal swept channels were employed in the routing of assault forces to a general approach area south and east of the ISLE OF WIGHT. One additional channel was swept from Bill of Portland to the head of the approach channels for the use of Force "U". These routes proved to be adequate and little or no interference was experienced between the several forces. The coastal routes also provided a fair degree of deception, a paramount consideration in view of the early sorties required of slow landing craft from the southwestern ports. These routes had been used considerably by large numbers of landing craft for several months, during initial assembly and training exercises, and most of the assault craft were in some measure familiar with them.

The approach channels were sufficient to permit a fast and slow grouping of each assault force, and were laid out so that a wide channel could be developed to the Western Assault Area on D day. Some difficulty was experienced by the slow convoy of Force "U" in locating the entrance to Channel No. 2, and the marker vessel does not appear to have been on station. The turning point in the approach channels should have had some distinctive marking as several instances of crossing from one channel to another were noted. In general, all channels were well-marked and accurately located.

Fortunately such mistakes as were made, though causing some delay in arrival, did not interfere with the essential timing of the assault as a whole.

As the U.S. forces were staged from Portland to Falmouth, inclusive, whereas the British forces staged in the general area of the ISLE OF WIGHT, U.S. ships and craft proceeded by substantially longer routes to the assault area. This required many of our landing craft to be at sea as early as H-39 hours.

II. ESCORTS

At the outset, the escort problem was recognized as a difficult one. The over-all commitment in view of the immediate follow-up and sustained build-up was enormous. For the assault forces this situation was somewhat alleviated by the assignment of 34 U.S. destroyers, 6 U.S. destroyer escorts, 18 PC and 18 SC in addition to a number of British escort types, ranging from Hunts to A/S trawlers and ML. Many of the destroyers were required to be phased forward for the

support of the minesweepers, the screening of heavy fire-support ships and transports, and to be in position and ready to function as control vessels. These demands resulted in a paucity of escorts for the large, slow landing craft convoys.

The escort for the slow landing craft convoys was augmented by a number of reserve fire-support destroyers. These destroyers and other large escort types were required to steam at 5-knots with these convoys, in narrow swept channels, subjected to strong cross-currents of as much as 3 knots. This was considered necessary, as the smaller escort types did not mount armament capable of coping with the two major threats, aircraft and E-boat attacks.

There were no losses from enemy air surface action to the assault forces or immediate follow-up while enroute to the assault area. No instances of positive enemy contacts in the assault phase were reported.

During the build-up phase, escorts were operated in groups by the Commanders-in-Chief, Home Commands. These groups were made up of British escort types, some of which were formed from ships returned from the assault. Some losses were sustained up to D / 17 day but these were light as compared to losses due to mining.

III. CONVOYS

Assault and Follow-up Force convoys were made up in accordance with arrival by tides. The composition of these convoys was determined largely by the tactical plan, with the underlying idea of not exposing types which were valuable to the build-up until it was assured that they could be expeditiously and safely unloaded. Only 15 LST were permitted to arrive off the U.S. beaches on the first tide.

The scale of the operation severely taxed the port facilities on the south coast of England and necessitated the use of many small ports and assembly areas. This resulted in a rather complex system of sorties and rendezvous of major landing craft, as well as transports and fire-support ships. The latter were assembled at Belfast and proceeded directly from there to the assault area. Although accurate timing of the 5-knot convoys was difficult due to the strong and fluctuating currents, sorties and rendezvous were carried out expeditiously by convoy and section commanders. This performance, together with the additional complications of back-tracking some convoys, occasioned by a 24-hour postponement, is considered as most commendable.

All convoys were long and unwieldy because of the narrow front required in the swept channels. The lack of escorts was a further complication.

The variety of ships and craft, and the complex movements involved, made it advisable to limit the assault convoys to two categories in accordance with speed capabilities as follows:

12 knots - fire-support ships, transports and LCI(L).
5 knots - fire-support craft, LST, LCT, and LCM needed for assault, which could not be lifted.

LST were not placed in a separate category as nearly all were engaged in towing rhino-ferries and causeway sections during the assault phase. A few of the tows were lost enroute, but the general performance was very satisfactory.

An example of the size of one of the slow convoys involved is given to illustrate the problem. Assault Force "O" slow convoy consisted of the following:

11	LST (10 with rhino tow)
2	LCI(L) (LCH)
168	LCT type
84	minor craft
28	escorts
293	Total

That convoys of this size arrived to deploy, and make an orderly and timely assault, is noteworthy.

THE APPROACH

The approach from the entrances of the swept channels to the transport areas was conducted generally in accordance with the plan. Navigation was greatly facilitated by the excellent job of channel marking performed by the minesweeper flotillas, by the special QH radio beacon gear installed in certain ships and craft, and by the Pointe de Barfleur beacon, whichhappily was lighted.

The approach plans of both Assault Forces stipulated H - 4½ Hours for the arrival of the fast convoys in their transport areas. This was necessary to permit transports and fire-support ships to proceed to their positions prior to the arrival of the slow convoys. Slow convoys included LCT which had to be deployed and land or launch tanks at about H-hour. This required an early arrival of these craft in view of the distance from the transport area to the beach and the routes to be employed in the final approach in order to avoid traversing unswept waters. Despite the fact that most of the transports arrived behind schedule, most of the initial boat waves touched down approximately on time. An exception was the Ranger landing which was 45 minutes late due to an error of the control vessel in mistaking Raz de la Perce for Pointe du Hoe.

THE ASSAULT

In addition to the difficulties inherent in any opposed amphibious landing, this operation presented certain problems not normally encountered.

The standard transport division organization had to be modified because AKA were not employed. Hence, the normal transport division lift for LCM was not available, necessitating the latter to proceed under their own power in certain instances. This extensive sea trip was conducted by the LCM in a commendable manner, with virtually no losses.

Navigation and timing in the ship-to-shore movement was influenced by the following factors:

(a) The position and range of coastal defense batteries dictated the location of transport areas at great distances from the beaches, i.e., 20,000 and 23,000 yards from OMAHA and UTAH Beaches, respectively.

(b) In the case of UTAH Beach, the lack of prominent terrain features and virtual obscurity of beaches by smoke and dust caused by the shore bombardment.

(c) The strong currents to be expected off the beaches.

The weather in the Assault Area was far from ideal for landing operations. The sea was choppy with a force 5 wind from the west. Although this weather does not appear to have seriously affected the embarkation of troops and lowering of boats, it undoubtedly affected the efficiency of the assault troops in view of the long boat trip.

The timing is believed to have been good in general. Many control vessels failed to make a report of the landing of the first waves despite prior instructions. Those which did report were in close agreement with schedule, i.e., 5 minutes late on OMAHA and 10 minutes late on UTAH.

The initial waves of Force "U" were unable to make an accurate land fall due to dust and smoke, and were set to southward from 1,000 to 1,500 yards. This displacement proved to be fortunate as obstacles and defenses encountered were less than at the planned beaches.

The DD tanks were launched successfully at 3000 yards off UTAH Beach, but due to late arrival of LCT reached the beach 10 minutes after the first assault wave had landed. On OMAHA, one group of 16 DD tanks was disembarked at the beachline because

of the surf conditions. The other group was launched at 6000 yards from the beach and it is believed that of the original 16 but 2 or 3 reached the beach. Those that succeeded in reaching the beach provided local support although it is understood that few, if any, got past the sea wall; mines, obstacles and enemy fire accounting for the majority of them.

Extensive and varied beach obstacles presented a serious problem in this operation. At UTAH Beach, where the opposition was smothered, obstacles were cleared expeditiously and little interference with the succeeding waves or build-up was experienced. The obstacles on OMAHA Beach were more extensive. This, coupled with the strong opposition, caused a delay in their removal and hampered operations for several days.

The traffic control appears to have been well-regulated at UTAH Beach. At OMAHA Beach, due to the inability to provide adequate breaches in obstacles and due to the opposition encountered, succeeding waves were forced to lie to until a clear run at the beach was possible.

The occupation of Ile du Terre and Ile du Large was accomplished as planned, no opposition being encountered.

The assault in general was carried out in accordance with the plan. The opposition on OMAHA Beach was stronger than expected due to the presence of a field division which was alerted and waiting. However, UTAH Beach offered less opposition than anticipated.

Coastal batteries proved to be ineffective and did not seriously interfere with the operation. It is believed that these batteries were neutralized, though not destroyed, by aerial bombardment and naval gunfire. It may also have been due in part to the inferiority of the troops manning these positions and in part to the destruction of communication and control facilities accomplished in the aerial and naval bombardments. Radar counter-measures are believed to have been very effective. Mobile batteries gave considerable trouble and it was not until D / 2 that the beaches were reasonably free of enemy gunfire from the high terrain between and on the flanks of the beaches.

All gunfire support was conducted from medium to close range. Battleships and cruisers were stationed from 15,000 to 6,000 yards off the beaches. Destroyers stood in as close as hydrographic conditions would permit and many of them were taken under fire by the coastal and mobile batteries. Many of the destroyers and several control vessels on OMAHA Beach engaged enemy positions with direct observed fire. All support ships coordinated observations in locating enemy positions and in general many of these batteries were silenced each time they came to life.

At UTAH Beach the neutralization of coastal defenses, required the continual firing of several of the large support units during daylight into D + 2 day.

There is a need for close support by gunfire in addition to the prearranged fire. Where opposition is strong, communication with the Shore Fire Control Parties may not be established for a long time. This was the case in connection with the Ranger assault on the battery at Point du Hoe, where the landing was late and much of the effect of the pre-assault bombardment had worn off. Here, some fire support was obtained by means of visual signals. In order to avoid firing into our own troops when there is urgent need for unplanned fire, an experienced military observer might be placed in close proximity to the beach, perhaps in a control vessel or scout boat. In the case of serious opposition over a considerable length of beach, an effective and timed barrage could be laid down by his direction to enable the troops to advance beyond the initial beach defenses.

FOLLOW-UP

Follow-up convoys of Force "B" arrived in the Assault Area on schedule. Unloading was delayed, however, for the following reasons:

(a) Many higher priority ships and craft of Force "O" were still to be unloaded.
(b) Rate of unloading on OMAHA Beach was limited by:

(1) the number of obstacles remaining to be cleared,
(2) stranded and wrecked landing craft on the beaches, and
(3) concentration of enemy fire on beaches and beach exits.

Unloading on UTAH Beach continued to proceed on schedule without major opposition.

Due to delays in unloading, it was not possible to adhere strictly to plan in return sailings. However, all HDML were returned and escort groups were formed and sailed as required. Combatant ships were returned to the United Kingdom in rotation for replenishment of fuel and ammunition, rate of sailing being governed by the screening and fire support requirements at any particular time.

BUILD-UP

In Operation [redacted] the build-up was of major importance. The enemy's system of defense, consisting of static divisions on the coast, backed by mobile reserve divisions, required that an immediate build-up of sufficient strength to oppose these reserves be landed, if the beach-head was to be secured and held.

A large number of merchant vessels were assembled in ports on the flanks for purposes of build-up. The majority of these were preloaded. Plans provided for a preloaded U.S. Division from the Bristol Channel and a similar British one from the Thames. A large number of stores coasters were preloaded and assembled in the Isle of Wight Area. These merchant vessels together with the landing ships and craft returned from the assault area were to operate in a continuous cross-channel shuttle service to provide a daily build-up of sufficient strength to counter such movements or reinforcements as the enemy was capable of. The estimate indicated that the beach capacities were sufficient to accomplish this task, but little margin remained, and the necessity for the early capture of a port with considerable facilities was indicated.

In addition to the LST, LCT and LCI(L) which, with a large merchant fleet, were to carry the build-up formations, equipment and stores, there was a further requirement, in view of the lack of port facilities, which consisted of craft with which to unload merchant ships on the far shore. This ferry service was provided by rhino ferries, LCT(5) and (6), LCM, LBV, LCVP, and DUKWs. LCT(3) and (4) were returned to the shuttle service.

Plans for the build-up were adjusted as the planning went forward, in accordance with revised intelligence and beach estimates. The appended graphs indicate the planned and attained figures for the first 24 days of the assault. The important point to note is that, though the immediate build-up suffered due to the opposition on beach OMAHA and resultant failure to remove the beach obstacles early, and though a protracted period of heavy weather caused an almost complete halt in the unloading for three days, the beaches and far shore organization were steadily developed until the unloading rate had substantially reached the maximum rate as planned by the Army, including the use of [redacted] which had not materialized.

The initial deliveries of MT and stores build-up, in addition to being diminished by the reasons given above, suffered due to the Army's desire that equipment be unloaded according to priorities. Had the scale of the build-up been smaller, this might have been possible. After the Army agreed to unload without regard to priority, the back-log was quickly cleared and unloading proceeded more smoothly thereafter.

ANNEX U - BUILD-UP

It is recognized that complete information concerning cargoes and vessels is desirable for the Army, but in the case of a shuttle control of such short length trips as operated in this case, any considerable amount of priority unloading will be very difficult to accomplish over open beaches and will operate to reduce the total amount of tonnage that can be handled across the beaches.

While periods of bad weather were to be expected and were allowed for in the build-up estimates, a storm from D + 15 to D + 16 not only caused a halt in the unloading for a considerable period, but had a serious effect by damaging the artificial port and other unloading installations beyond repair by the stranding and loss of many ferry craft, and by the obstruction of much of the beaches.

Ships and craft were sailed from the assault area by the assault force commanders. These commanders were assisted by the organization which was to function as the Shuttle Control. This organization arrived in the depot ships, HMS CAPETOWN and HMS CERES, early on D plus 1 day and took over the Shuttle Control at 1200 on D plus 3 day.

The two depot ships with the Shuttle Control on board were anchored near the end of the swept channels. The CAPETOWN was anchored to seaward to receive incoming convoys and direct them to unloading berths or anchorages. The CERES was anchored inshore and to one side and sailed unloaded ships and craft in return convoys from a northbound assembly area. The Shuttle Control Command was in the CAPETOWN. This command was responsible for keeping the Army informed of expected arrivals, and for dispersing these arrivals to the proper unloading sectors off the beaches. Upon the release of these ships by unloading authorities, convoys were assembled and sailed for loading ports in the U.K.

The Shuttle Control, to function properly, required a large number of despatch craft, which, although provided for in the plan, were not in sufficient numbers, nor of suitable characteristics. Craft of the small escort type such as PC and SC find many applications in operations of this type and an adequate number should be provided. PT and Coast Guard Rescue Boats were diverted from their primary duties in some cases and thrown into the breach. Some British despatch boats were provided for the operation, but these craft were not sufficiently seaworthy, or reliable, to do the job.

It was found feasible to dry out LST for unloading and this relieved the load on the ferry service immeasurably, as the rhino-ferries and LCT could then be used for unloading MT ships and coasters.

The far shore organization functioned fairly well once certain initial handicaps were overcome. Lack of communication facilities was the greatest handicap and future planning for an operation of this nature should provide for methods of control involving a minimum of reliance on communications, or provide better communications than were available in CAPETOWN, CERES, and the other craft and shore units involved. An ample supply of dispatch craft is considered to be the most effective means of maintaining proper liaison and control of unloading, particularly in the early stages. The need of a permanent organization to take over control of unloading and ferry craft at a definite time is clearly indicated. The transition period between the assault and the permanent organization taking over should be a minimum.

NOIC

The NOIC, or Naval Officer-in-Charge, on each beach was to operate as a port officer, operating the ferry service and keeping the Army advised of the arrival of ships and craft off the beach. He was to advise the Shuttle Control as to the assignment of berths for unloading and to release ships when unloaded for the return sailing by that agency to the U.K.

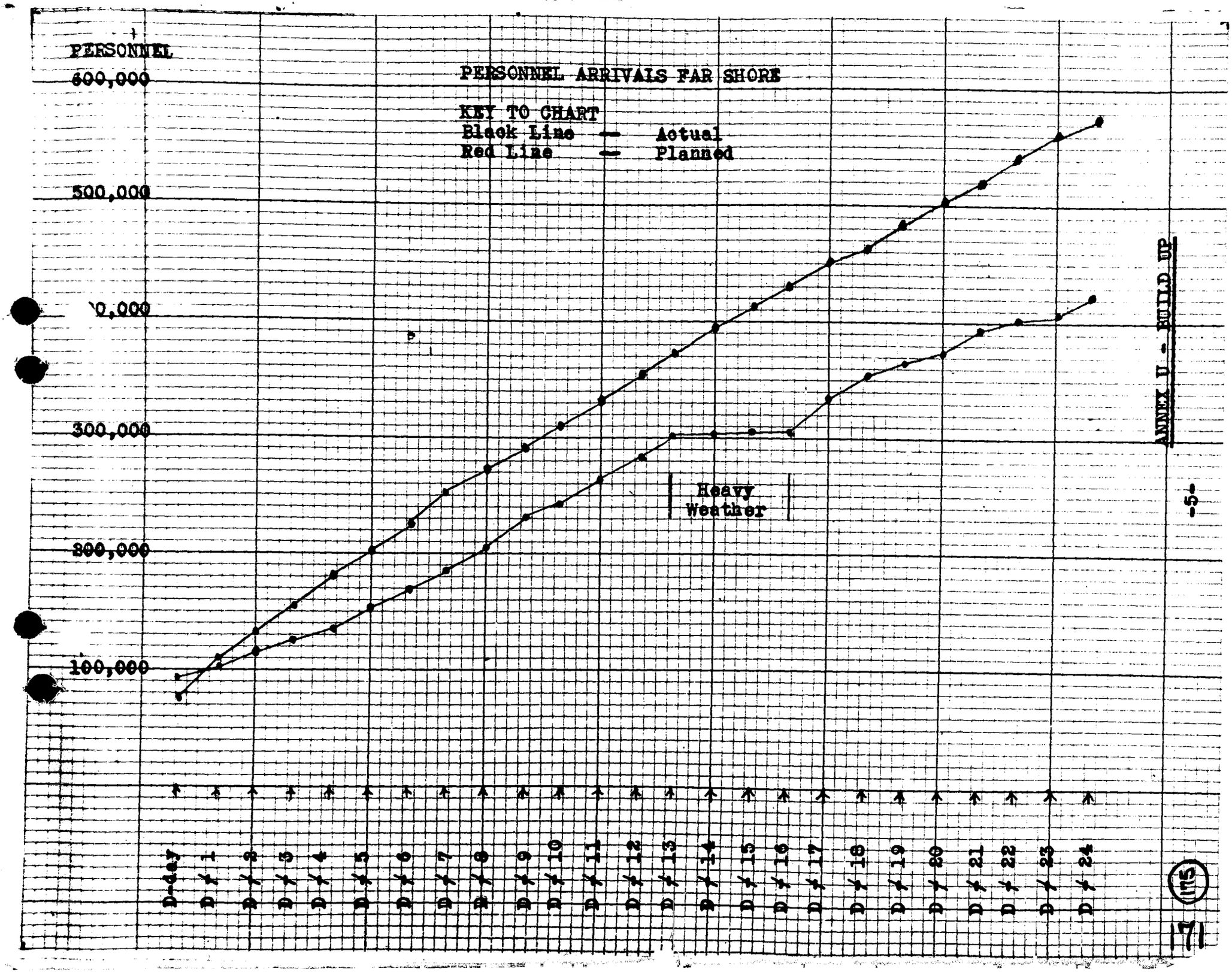
To accomplish these functions, several things were required: first, excellent communication facilities, both with the near shore and the responsible Army authorities on the far shore; second, notification sufficiently in advance of arrivals of ships in convoy and their cargoes; and third, a means of control of the ferry craft whereby no time would be lost in locating ships which were to be unloaded. All of these requirements were most stringent and could not be met under the existing conditions.

The communication facilities were not sufficient to provide for the close liaison work required. Due to the impromptu method in making up build-up convoys and the inclusion of ships from many ports, sailing telegrams were not made until the last moment. This permitted about a ten-hour interval between the composition of the sailing telegram and the arrival of the convoy on the far shore. Allowing for a good performance in coding, transmitting, decoding and distributing these messages, this interval was reduced to a maximum of about 6 hours between the time that the Army was informed of the convoy composition and its arrival. In addition, manifests of cargo were not promptly received by mail.

At first, when the Army desired unloading in accordance with priorities, it was necessary for craft to proceed throughout the area and attempt to locate the desired cargo by questioning ships. This caused delay.

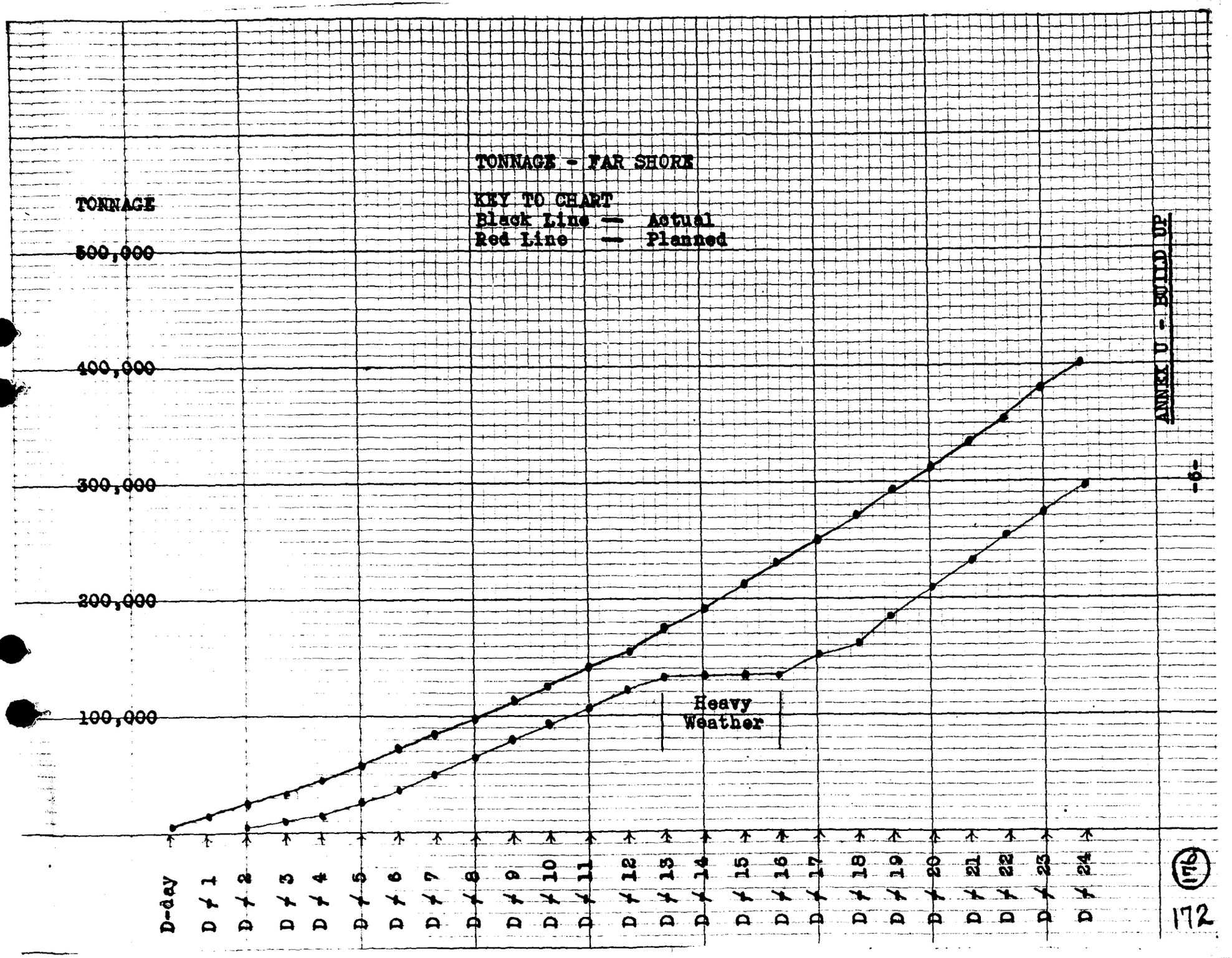
Once the priority system of unloading was abandoned, the NOIC was relieved of much detail and the ferry craft were able to unload ships as they arrived, in addition to clearing up the back-log promptly.

Army and Navy headquarters on UTAH Beach, and later on OMAHA Beach, were established in close proximity. This facilitated communications and cooperation between the services.



ANNEX U - BUILD UP

(MS)

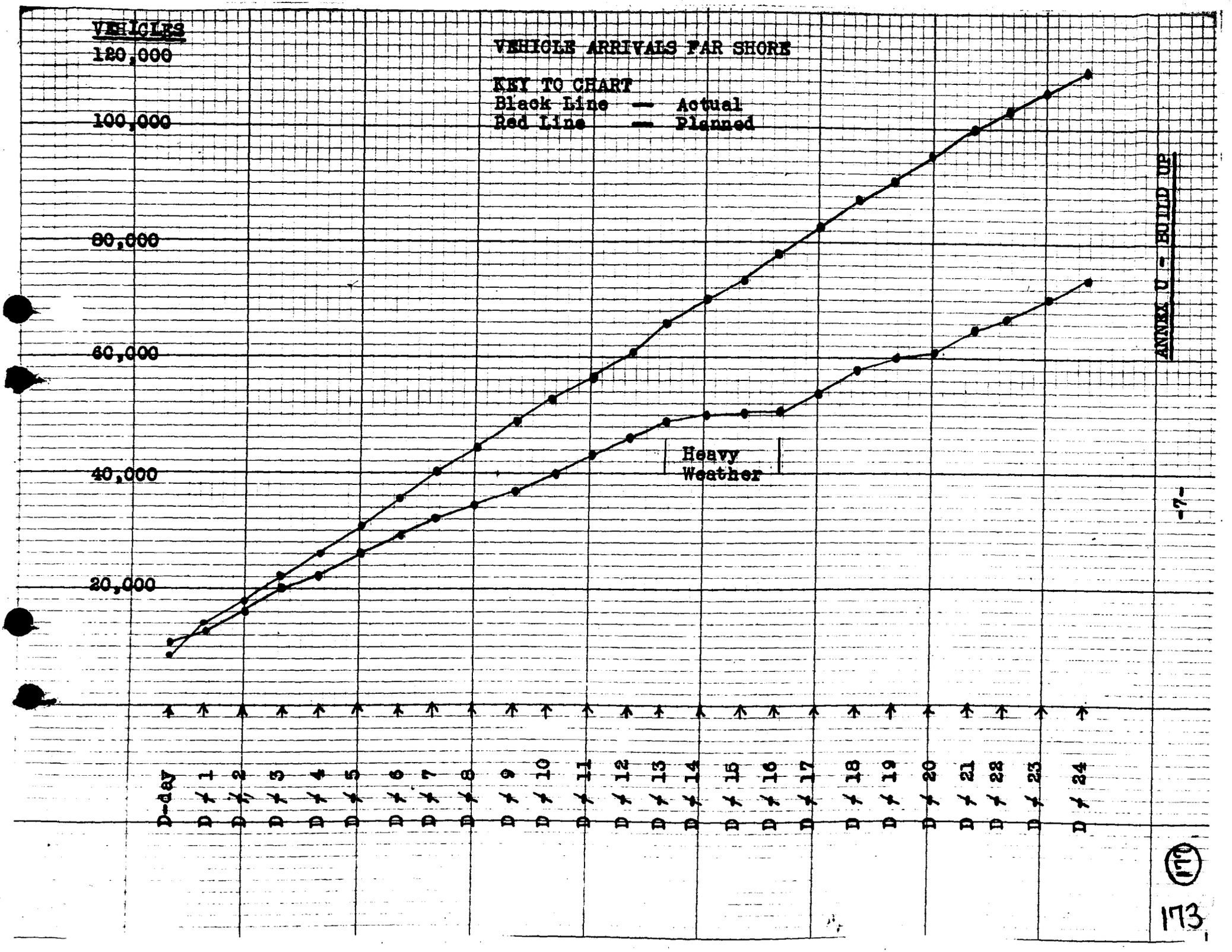


ANNEX U - BUILD UP

-6-

(176)

172


VEHICLES
120,000
100,000
80,000
60,000
40,000
20,000
VEHICLE ARRIVALS FAR SHORE
KEY TO CHART
Black Line — Actual
Red Line — Planned
Heavy Weather
ANNEX U - BUILD UP
D-day
D + 1
D + 2
D + 3
D + 4
D + 5
D + 6
D + 7
D + 8
D + 9
D + 10
D + 11
D + 12
D + 13
D + 14
D + 15
D + 16
D + 17
D + 18
D + 19
D + 20
D + 21
D + 22
D + 23
D + 24

UNCLASSIFIED

UNCLASSIFIED