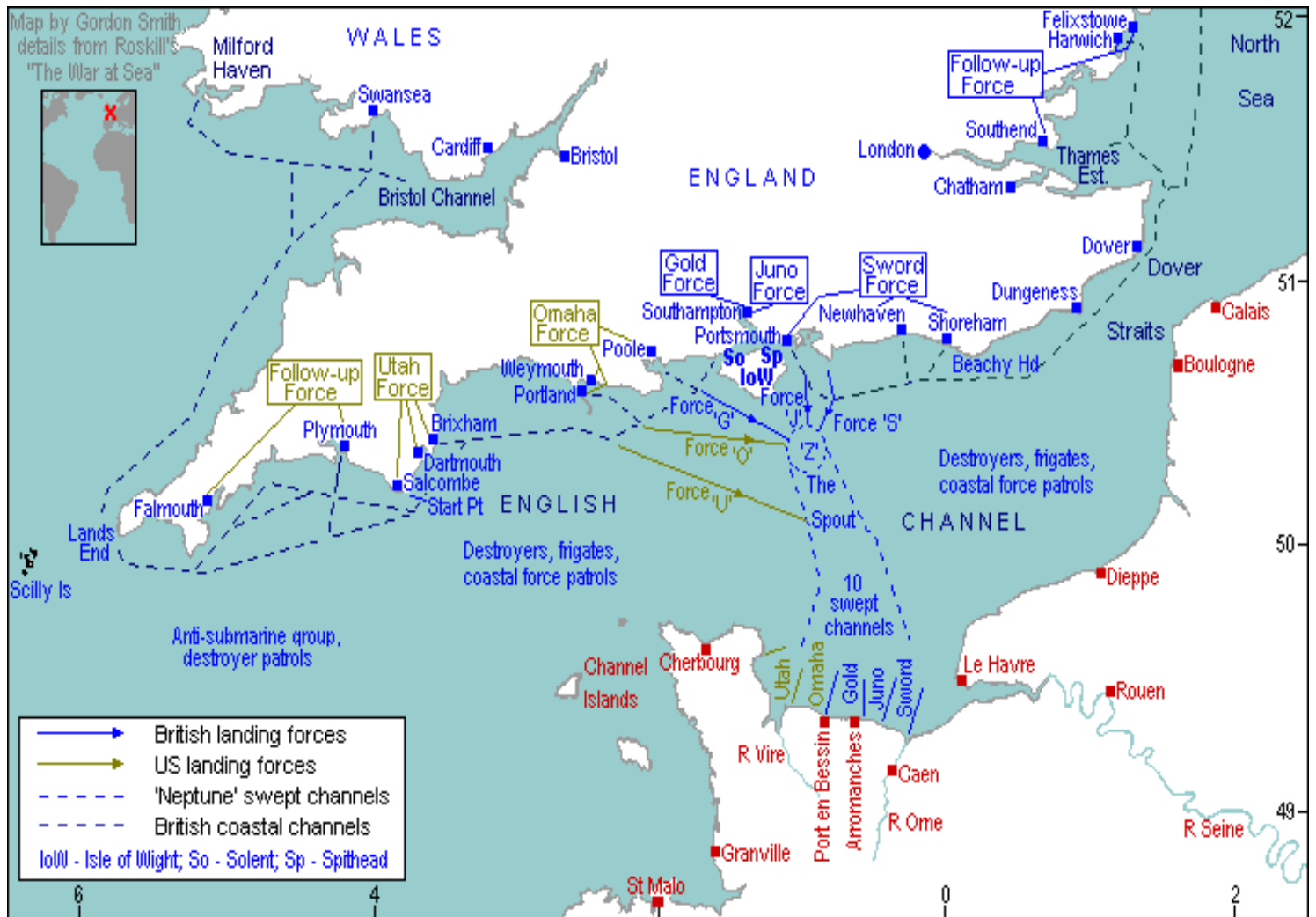
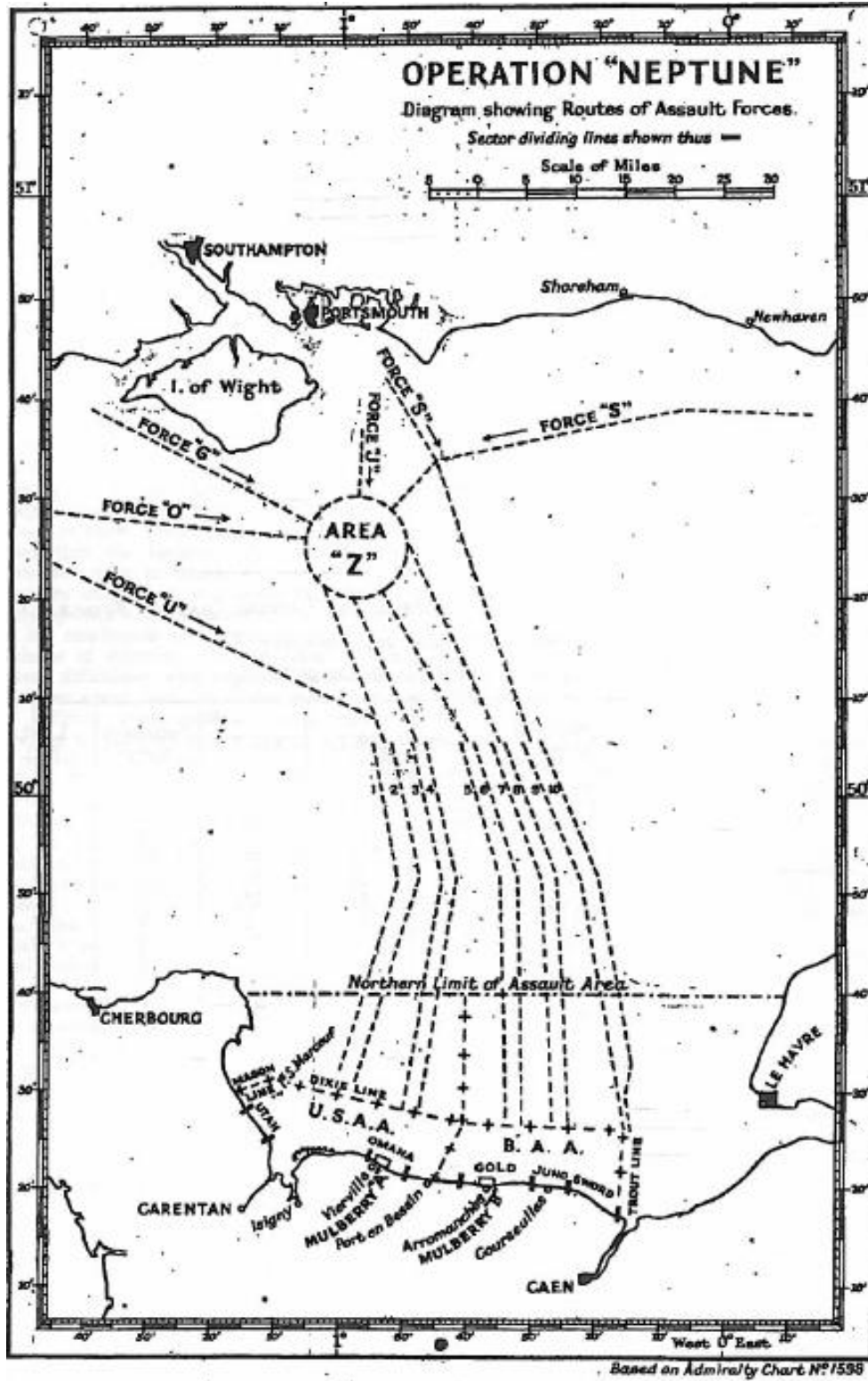


# The Invasion of Normandy: Operation NEPTUNE



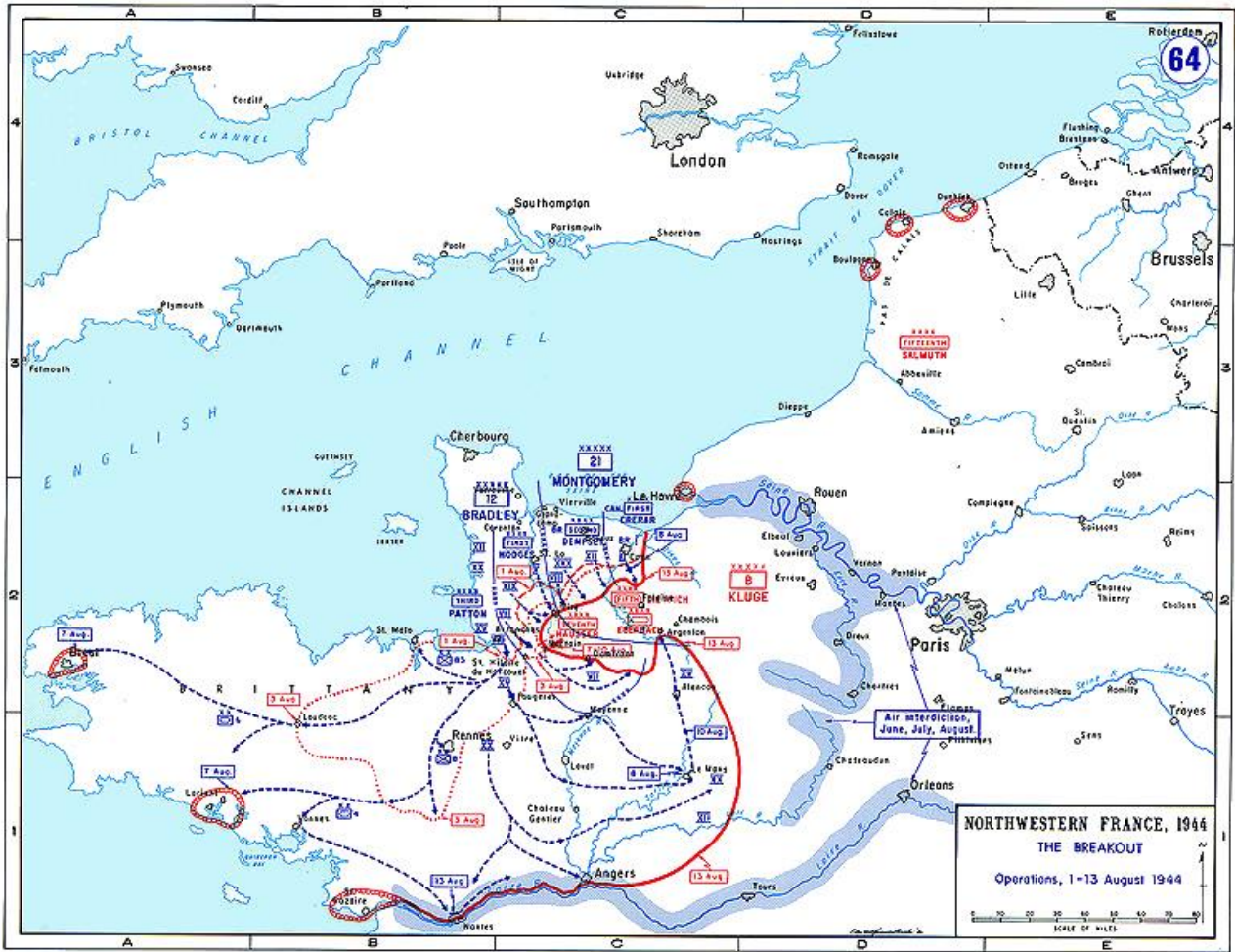
**The Plan**

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**The Approach**

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**Maneuver**



**Atlantic Wall**

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## ***United States Naval Administration in World War II***

Commander, U.S. Naval Forces in Europe: Volume V

### **CHAPTER IV NEPTUNE OPERATIONS PLANS**

#### **PART 1 THE ENEMY SITUATION**

##### **A. German Land Forces**

1. The defense of France and the Low Countries against Allied invasion was entrusted to the German "Commander in Chief West", Field Marshal von Rundstedt.<sup>1</sup> The military force assigned to him to accomplish this task comprised Army Group D. Under C in C West (CinC Army Group D), the area to be defended was divided between four armies.
  - a. The Fifteenth Army held the eastern channel coast from the Rhine to the Seine.
  - b. The Seventh Army held the western channel coast and the Brittany Peninsula from the Seine to the Loire.
  - c. The First Army held the Biscay Coast from the Loire to the Spanish frontier.
  - d. The Nineteenth Army held the Mediterranean coast and the Italian frontier.<sup>2</sup>
2. The German dispositions in the West provided for manning the various coastal sectors with static infantry, while the mobile divisions were held in reserve for counter attack purposes. Static divisions were assigned to the command of the appropriate army commanders. The mobile reserves, directly under command of Army Group D, were situated as close to the coast as possible, usually 20 to 100 miles inland and invariably at main communication centers. On the eve of the invasion (17 May 1944), Army Group D consisted of some 60 divisions, made up of seven operational Panzer divisions, three Panzer divisions in training, two Parachute divisions, thirty-seven operational Infantry divisions, and ten Infantry divisions in training. Of these, forty-one divisions were static coastal defense troops, while about nineteen were mobile field divisions in reserve.

##### **B. The German Defense Plan**

3. The German plan for defending Europe was devised so as to exploit two great advantages possessed by the defender of a sea front, namely: (1) the weakness and vulnerability of an assaulting force during the landing period, and (2) the slow rate of tactical build-up possible, with sea communications, as compared with that permitted by a well-developed system of land communications. It was also designed to minimize dangers arising from German weakness in the air and on the sea.
4. The enemy's policy for the defense of occupied coasts was, therefore, built upon two basic principles and one assumption.
  - a. **The assault would be met on the beaches and any penetration made was to be broken at the coast line.** All defenses were placed as near to the coast as was physically or tactically possible, but were not in great depth, because of the length of the coast-line to be defended and the limited troops available.<sup>1</sup> Supporting artillery was sited so as to cover the coast or seaward approaches to it. Beach defenses were continuously manned, and

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- protected by concrete or armor. All headquarters and air and naval bases were well protected against air and air-borne attack;
- b. **Static coastal defenses were to be seconded and supported by mobile reserves**, so disposed as to permit quick reinforcement of any threatened coastal sectors, and in such numbers as to be able to build up for counter attack more rapidly than the invader could build up his forces from the sea.
  - c. The assumption was that an assaulting Allied force would be compelled to seek the immediate possession of a port, in order to discharge the vast quantities of men and material needed to fight the land campaign. Therefore, **the invader was to be denied access to all ports**. Defenses tended to be much denser and heavier near ports, estuaries and coastal regions giving access to ports. The ports themselves were locally defended by a perimeter system, especially directed against sea approach.
5. In conformity with this general policy, no second line of defenses existed. The troops manning the coast and their supporting mobile reserves were to remain in their positions until the bitter end. No prepared defense systems had been constructed in the interior of France or the Low Countries, as labor was not available for such work, even if the positions to be defended could be determined before the battle developed. Available resources and material had, therefore, been expended on strengthening the one really good defense line -- the coast. The existing French, Belgian, and Dutch interior defense lines, which faced the wrong way for German purposes, had been dismantled. Very little work had been spent even on the Siegfried Line, the West Wall of Germany itself. Inside the coastal periphery, prepared defensive positions were limited to the local defense of important objectives, such as air bases, major towns and a few strongly fortified Headquarters. Bridges and railway marshaling yards had been prepared for demolition on an extensive scale.
  6. In short the defense system was that of a continuous hard, thin "skin" often immensely strong, near vital ports for example, and always easily reinforcing from nearby concentrations of mobile reserves, but never more than "skin-deep". This skin was a blend of infantry fortifications, emplaced supporting artillery, and obstacles. Once this skin was broken, no prepared positions remained, and the German armies would be compelled to meet the Allies in the field.

### C. Coastal Defenses, Fortifications and Obstacles

7. The fortifications consisted of a series of strong points, linked where necessary and practicable by continuous obstacles in the form of mines, wire, anti-tank walls, etc. In villages and towns on the seafloor, almost any house might have its ground floor bricked in or reinforced with concrete to form a pill-box. Sea walls were made into strong obstacles. Anti-tank walls were stretched across the entrances to side streets. Major strong points were formed from suitable buildings at strategic places. Mines and wire were liberally used to reinforce these measures. The coast itself had strong points at intervals of one to two thousand yards. Between these strong points was wire and rows of mines. All these defenses were sited as near the high water mark as possible, but some headquarters strong points were "staggered" in the rear. The average depth of the whole defense system, up to the battalion headquarters, was about two miles. In the vicinity of cliffs, strong points were sited at all possible landing places, and in all clefts or gullies that could give access to the land. Marshy land behind beaches was flooded. Roads and bridges were mined.
8. Supporting artillery, composed of guns of all calibres and situated in a continuous coastal belt, covered and reinforced the infantry fortifications. Heavy and medium coastal batteries, with intersecting arcs of fire, were capable of bombarding an attacking force as far, in certain places as 20 miles from the shore. As the invader approached nearer he came within range of lighter batteries, field artillery, and howitzers. The beaches themselves were generally covered by enfilading fire, or by direct fire from mobile batteries inland. Artillery was directed by radar as well as by visual observation.
9. In order to ham-string the Allied build-up by denying them the use of ports, the German coastal defenses were particularly dense and strong in and around all harbours and estuaries, even very minor ones. Density of defenses varied, not only near ports, estuaries and other vital points where they tended to increase, but also over the area as a whole. Variations in density reflected the distance from Allied fighter bases, the approachability of the coast, the strategic prospects of the hinterland, and so on. In areas where defenses were thickest they also tended to be intrinsically stronger, with guns of heavier calibre, pill-boxes of stouter construction, and strong points at closer intervals. In "weak" areas, the quality and morale of the troops, and their degree of alertness, was likewise inferior to those in "strong" areas.
10. The Germans had constructed an extremely well equipped system of radar, along the north coast of Europe from Brittany to the Baltic. They placed great reliance on its accuracy and its dependability.

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This system was particularly complete between Den Helder and St. Nazaire, with a mixture of short range and long range sets, surface sweeping and air warning sets, and gun control equipment. In addition, there were three or four chains of GCI stations located behind the coast but in front of the German frontier.

11. At frequent intervals along the coast, often associated with strong points, but always protected by surrounding wire, the enemy had installed searchlights, sited to sweep to seaward and sometimes to cover the beaches. In and near ports these occurred with greater frequency.
12. The defense system on the beaches consisted of a series of strong points, linked by obstructions, which were spaced at intervals, varying from one to three or four thousand yards. In the NEPTUNE area the average separation was about two thousand yards. These defense positions were generally thickest and strongest in positions facing Allied bases. They were rarely placed more than two miles behind the coast, and varied greatly in form and strength; from specially constructed series of concrete buildings (gun casemates, pill-boxes, magazines, control posts, personnel shelters) to single pill-boxes or weapon pits, with M.G. positions in open trenches. The wire and mines surrounding the strong points again varied in density and strength with the particular terrain and area. Such strong points were designed to afford each other mutual support by the fire of the light guns, anti-tank guns, and machine guns with which they were armed. They were in communications with each other and with regimental H.Q., itself housed in a major strong point. In the weak areas, the great majority of strong points were infantry positions only, while in strong areas almost half of the strong points were based on an artillery battery, a flack battery, a radar or communication installation, or some other important point. Nearly 40% of the strong points were manned and operated by naval or air force personnel.
13. The following are some of the principles which the Germans followed, in laying out and siting coastal defense positions:
  - a. The German policy was to provide, underground if possible, heavy shelters for their men with light weapons as well as in coastal batteries, from which they were to emerge to their guns after any bombardment, via trenches or covered passages. These shelters, with firing slits covering their entrances, were equipped for the maintenance of their occupants for considerable periods, even if isolated. Concrete 6 ft. 6 in. thick was used liberally and universally in heavily defended areas. Even in lightly defended areas it was some 3 ft. 3 in. in thickness.
  - b. Fortifications, including artillery (except for howitzers) were sited well forward and, when possible, located along a line at the back of the beaches. Defense positions were sited so as to cover beaches, inshore waters and sea approaches with enfilading fire.
  - c. They were sited on low ground, whenever possible, in order to give the maximum danger zone.
  - d. All defense positions were self-supporting (being provided with all-round fields of fire), and self-contained (being provided with independent stocks of food, water and ammunition). Battery positions, headquarters, radar stations, signals installations and other important positions, were protected by numerous garrison troops and by strong concrete fortifications. These were put underground, whenever possible, to provide greater protection against naval and air bombardment and against airborne attack.
  - e. In order to economize manpower, maximum use was made of automatic weapons.
  - f. Maximum use was made of obstacles against Allied armour.
  - g. In coastal towns, civilian buildings were evacuated and reconditioned as fire positions, or demolished so as to clear fields of fire.

14. A feature of the German coastal defenses was the extensive use of obstacles. They were designed so as to impede movement up to and off of the beaches and to protect defensive positions against assault from any direction.

- A. **Mines** were first in the category of "obstacles". They were laid in rows at the back of the beaches, sometimes almost at high water mark, sometimes up to a few hundred yards inland. They were disposed in staggered belts and were often surrounded by trip-wire, which served to give warning of intrusion to the local defenders. Mines were sometimes behind and sometimes in front of the barbed wire defenses. Anti-personnel mine fields were liberally used around strong points, while tactical anti-tank, anti-personnel and mixed mine fields were set between them. The normal density was one per yard, with a normal pattern of one to three belts each of three to eight rows, and with a normal depth of a field of from 50 to 300 yards.

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- B. **Barbed wire** was used extensively, both on and off the beaches, between, and in front of, strong points. A line of underwater barbed wire was occasionally strung along the beaches as an obstacle to troops wading ashore.
  - C. **Walls** were very common obstacles. They were employed either as road blocks, or as a continuous breast work along beaches, promenades and roads. They were usually 6<sup>1</sup>/<sub>2</sub> to 10 ft. high, and 3 to 8 ft. thick.
  - D. **Anti-tank obstacles** were sited wherever the natural geography of the coast provided a possible exit for tanks and motor vehicles. Steel obstacles of various types were widely employed, the most common types being the gate and the curved rail from the old French, German and Belgian defense lines, and the tetrahedron. Sea walls were reinforced and wired to turn them into more formidable obstacles. On the seafront and in built up places, the entrances to the side streets leading inland were similarly blocked. Ditches, which were particularly common, especially in low lying areas, were 40 to 60 ft. wide and filled with water. Dry ditches were occasionally employed, sometimes covered over, of a width of 9 to 15 ft. and depth of 8 to 12 ft. These obstacles continued further inland even though the defenses were a "skin" and confined to the coast, in order to deal with the possibility of errant tanks surviving the initial landing.
  - E. **Inundations** were a popular German device. Extensive preparations for inundating wide stretches of low lying or marshy ground had been made, while some areas had in fact been flooded before the landings occurred.
  - F. **Under water obstacles** had been installed along nearly all possible landings beaches, and sometimes even in front of cliffs and rocks, with the object of impeding Allied landings by breaking up or blowing up small boats as they beached or retreated.<sup>1</sup>
15. Most of the beach obstacles in Normandy and Brittany were the ordinary steel anti-tank obstacles used on land. From the mouth of the River Somme northward, timber stakes were ordinarily used instead of steel obstacles. The types of obstacles used were Element C, steel tetrahedra, steel hedgehogs, vertical steel rails, and timber posts. The spacing between units in each row varied from 8 feet to 50 feet, the tendency being to thicken them up as work progressed. Normally, there were three to four rows of steel obstacles located some 12 to 17 feet below high water mark, but sometimes these obstacles extended irregularly almost down to the low water mark. Waterproofed land mines of various types were attached on or near the obstacles.<sup>1</sup> Sea mines were usually not laid close inshore to defend the beaches. Minefields were normally seaward of the coastal swept channels. In the immediate approaches to some major and minor ports, however, extensive inshore minefields had been laid.
  16. The defense of ports and estuaries was more developed and more concentrated than that of intervening stretches of coast. The enemy assumed that an invading force would be compelled immediately to secure adequate ports through which to pour the vast quantities of material needed by a modern army. His defenses were based on that assumption. Heavy artillery was sited so as to defend the approaches to all major ports. Every possible entrance was guarded by batteries of all calibres. Booms of various types, sometimes with explosive charges, were universal, and a few controlled minefields had been laid. Flame-throwers were available in a number of port areas. Piers and jetties were mined and sometimes had gaps in them. Pill-boxes were mounted on them, or in them. Torpedo tubes were installed in some harbors. Port defenses faced inland as well as seaward to guard against the possibility of a surprise attack from the landward side, and also to make it possible to hold a port, as a self-contained position, for as long as possible, even after it had been surrounded. Strong points and artillery were placed in a perimeter about the town. The "skin" thus became "port-deep".
  17. Ports were liberally stocked with water, food and ammunition, and were provided with self-sufficient army formations, equipped to withstand a considerable siege even after having been cut off. One feature of all port defenses was the preparations made for demolitions. These were not defenses in the ordinary sense, but they constituted a part of the enemy's plan to deny the Allies the use of these ports. They were universal and complete. Quays were mined; block-ships (or barges for use as block-ships) were ready; locks, cranes and harbor facilities of all sorts were prepared for demolition. Ports were also heavily mined both ashore and in the harbor. Heavy anti-aircraft batteries on the coast were confined almost exclusively to the neighborhood of the ports. Mobile anti-aircraft units, principally for the defense of coastal airfields, were deployed as required.
  18. Estuaries which led to a port, or which might have served the purpose of a harbor or port, were similarly defended. Howitzers, fitted by their plunging fire for the task, were sited so as to drop a barrage across the estuary, while heavier batteries covered the seaward approaches. The mouth of the estuary often had a net or boom, and its shores were protected as if they were beaches. The

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smaller ports, and even minor havens, were similarly defended though to a lesser degree. The smallest harbor had a wire "boom" across its entrance. The quays were often mined, and pill-boxes and strong points were sited to deny entrance.

#### **D. German Coastal Batteries**

19. German coastal batteries consisted of guns of every calibre, from super-heavy 16" guns down to old French 75's of the First World War, and varying in range and accuracy from very good to very bad. (The approximate location and types of the German batteries in the Normandy area is shown in the accompanying sketch.) The following were the types and ranges of guns.
  - a. Heavy coastal batteries (8" and over) had, as a rule, a maximum effective range of 40,000 yards.<sup>1</sup>
  - b. Medium coastal batteries (between 4.5" and 8") had a maximum range of 27,000 yards. The 155 mm. was the most common gun of this type.
  - c. Light coastal batteries (between 3" and 4.5") had ranges up to about 20,000 yards. This category included old British and French guns, modern pieces and dual purpose anti-aircraft guns.
  - d. Howitzers, which were usually sited inland for planting fire on beaches or sea approaches, had ranges varying from 7,000 to 18,000 or 19,000 yards.
  - e. A wide variety of ancient and modern mobile guns were situated in the NEPTUNE Area, usually in or near ports. Their maximum range classification in general followed that of fixed batteries of equivalent calibres.
20. The Germans made it a general rule to site all classes of coastal batteries as far forward as possible, so that most of them stood very near to the beaches. Howitzers formed an exception to this practice and often stood several miles inland and on reverse slopes. Wherever possible the Germans endeavored to site their guns so that they would have a full 360° arc of fire. Coastal artillery was able to engage in either direct or indirect fire. In most cases, fields of fire had been carefully plotted so that nearly all guns were capable of blind barrage fire.
21. The Germans employed both radar and visual methods of fire control. Control positions were often sited at a considerable distance from the guns. Communication cables were normally underground.
22. In addition to coastal batteries, the Germans held a certain amount of mobile artillery in divisional, corps, Army and Army Group reserve. This was to be despatched to any assaulted sector to reinforce the fixed artillery. To accommodate a concentration of reserve artillery at any point along the coast, a large number of empty emplacements, armed only with light guns, were built. Heavier guns, gun howitzers and howitzers, from reserves further inland, could thus be emplaced quickly in any threatened sector.
23. Coastal batteries, including howitzers and field artillery were housed, with few exceptions, in concrete emplacements from which only the muzzle of the gun protruded.<sup>1</sup> The standard thickness of concrete pill-boxes and
24. 6'6" in strongly defended areas and 3'3" in weak areas. Shelters for very heavy guns and for very important points were sometimes as thick as 10 to 15 feet. Reinforced concrete of the mat type, with 15 mm. rods at 10 and 12 cm., was the standard method of construction. Armour plate, though not widely used, was employed when available. It was considered preferable to concrete, because, being thinner, it permitted a wider field of fire. Steel cupolas and turrets, giving an all-round field of fire and coupled with overhead concrete protection for personnel, were common.
25. The Germans made it a universal practice to provide all batteries, whether open or emplaced, with extensive underground reinforced concrete shelters for the protection of the crew and ammunition. These shelters were connected by undercover trenches. Coastal batteries were themselves turned into miniature strong points for their own local defense. Wire, mines, pill-boxes, anti-tank and even light field guns, usually surrounded them in proportion to their importance. The lightest batteries had little beyond wire and a few mines, while the heavy batteries of the channel coast were each the center of a major defensive position.

#### **E. Disposition of Garrison Troops and Mobile Forces**

26. This massive skin of coastal fortifications was manned by four coastal armies, consisting of some 41 divisions of static troops.<sup>4</sup> Each coastal army included two or three coastal Army Corps, while each Corps in turn was made up of two or three coastal divisional sectors. Frontages held by coastal divisions varied from about 25 miles, in Belgium and the Pas de Calais, to 40-50 miles in Normandy and to over 70 miles along the Biscay coast, depending upon the distance from Allied bases, the

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- likelihood of invasion, the nature of the hinterland, and so on. Some two or three static divisions were stationed in the NEPTUNE Area itself, each defending approximately 40 miles of sea front.<sup>2</sup>
27. The majority of coastal divisions were not up to full strength in men or equipment. They included a proportion of non-German personnel (e.g. Poles, Belgians, Dutchmen, etc.). They were, however, well supplied with concrete defenses and were expected to fight well until driven from their fortifications. Coastal defense divisions ordinarily had only two reliable regiments,<sup>1</sup> both stationed in the forward area. There were few, if any, regiments in reserve. Each coastal regiment normally had two battalions forward, and one in reserve. The reserve battalion was used as a standby for resting troops out of the line, and for immediate thickening up of an attacked sector. It was stationed so as to arrive in the battle area within two or three hours of the assault. There were four general types of coastal divisions:
    - a. Some 16 infantry divisions were organized on a normal three regimental basis, but with a reduced scale of transport and liable to be called on to supply drafts for active fronts;
    - b. About 8 lower establishment infantry divisions were on a two regimental basis, with reduced scale of artillery and transport;
    - c. Some 13 static reserve divisions, whose primary object was the training of recruits, had to combine this function with coastal defense because of man-power shortage;
    - d. Four G.A.F. Field Divisions, recruited from personnel who enlisted in the German Air Force, were being used in a purely infantry role as reserves for coastal defense forces.
  28. By mid-May 1944, the Germans had accumulated some 19 divisions of Mobile Reserves in France and the Low Countries.<sup>2</sup> This force consisted of 8 Panzer, 1 Panzer Grenadier, and 10 Infantry Divisions. They consisted, for the most part, of armour and motorized divisions, refitting after service in Russia, or being reformed after destruction on the Eastern or Mediterranean fronts. They also included S.S. and paratroop divisions, some still in training, and others not up to full strength, in personnel or equipment, or both. But the greater part were full-strength and were rated good to high in combat efficiency.
  29. Prior to 1944, these divisions were usually transferred to active fronts, as soon as they were up to strength and fully trained. In 1944, in view of the expected assault, the Germans kept their mobile reserve in the West as strong as the situation on the other fronts permitted. The role of the mobile reserves was to effect deliberate counter-attacks to throw any invading force back into the sea before it could penetrate the coastal defenses. The Germans intended to bring the first of these mobile divisions onto the scene within 6 to 12 hours after any landing.
  30. The mobile reserves were retained under the direct command of Army Group D, and were not assigned to any of the coastal armies. Most of them were not centrally stationed, but were disposed at fairly regular intervals in communication centers some 20 miles inland. If any particular area was threatened, they were to be moved even closer to the coast. Troops were ordinarily billeted on the civilian population. Camps and barracks were avoided except in a few training centers. Units were dispersed over a fairly wide area but always along two or three main roads, to facilitate speed and ease of departure without the necessity for moving through a concentration area. In an emergency, the two divisions nearest the area assaulted were to make for it at once, by road if possible. The Germans planned to launch at least one division in counter-attack by the afternoon of D-Day.
  31. Mechanized divisions, except for those very far away, were scheduled to use roads. Tracked vehicles were to entrain, in case the distance to be covered was more than 120 miles. Other divisions were to travel by rail, unless forced by Allied air bombardment to use roads. To provide for such a contingency, the Germans had requisitioned enough civilian vehicles to be able to transport several divisions simultaneously.
  32. In addition to the mobile divisions, Army Group D also held a certain amount of mobile artillery, including railway artillery, motorized guns and a large quantity of wheeled coastal artillery, in a central reserve. German heavy flack weapons were also mobile and so designed as to be usable against aircraft or against surface targets.
  33. The Allies estimated that on D-Day the German dispositions of mobile reserves would permit them to reinforce the 5 static divisions, in and near the NEPTUNE Area, with a maximum of 3 mobile divisions,<sup>1</sup> bringing total of 8 in action on D-Day. These would include 4 static infantry defense divisions, 1 field infantry division and 3 armoured divisions. By D plus 3, the Germans were expected to be able to deploy an additional 7 divisions, making a total of 15 (4 static defense infantry divisions, 5 field infantry divisions and 6 armoured divisions).<sup>1</sup> By D plus 6, they were expected to be able to deploy a further 6 divisions, thus making a total of 21, in the assault area. All of these figures represented the optimum rates. It was the best the Germans could do. This maximum would not be achieved however, if the Allied cover plan induced the Germans to delay the movement of mobile reserves or if Allied air forces impeded their movements. In fact, the Germans in June 1944 fell far short of these rates of reinforcement. The location of German divisions, the

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areas of responsibility of German armies and the optimum rate of German reinforcement into the Normandy area, are show on the appended sketches.<sup>2</sup>

## F. German Naval Forces

34. In November 1943, German naval forces (major vessels) consisted of:<sup>3</sup>
1. Two battleships (one seriously damaged)<sup>4</sup>
  2. Two Pocket Battleships (unfinished)
  3. One aircraft carrier (unfinished)
  4. Two heavy cruisers
  5. Four light cruisers
  6. Thirty-seven destroyers (approximate -- excluding uncompleted and non-operational units)
  7. Eighty-three torpedo boats (approximate, excluding non-operational units)
  8. Two hundred U-boats (approximate, excluding non-operational units).
35. In March 1944, ANCXF estimated that:
- a. "Enemy surface vessels likely to be used against the assault were the following:
    1. Five destroyers
    2. Nine to eleven torpedo boats (including Eblings)
    3. Fifty to sixty E-boats
    4. Fifty to sixty R-boats.
    5. Twenty-five to thirty M-class minesweepers.
    6. Sixty miscellaneous craft.
  - b. "A further six destroyers and 10 torpedo boats might be sent from the Bight or Baltic, but if so, the enemy's heavy ships would have no screen should they put to sea.
  - c. "130 U-boats operating from Biscay ports might, between D plus 4 and D plus 14, be reinforced to a total of about 200. They could work for a short time at a ratio of 60 percent at sea, losses up to 30 a month being made good from the partially trained Baltic reserve.
  - d. "Up to 25 short-range U-boats (300 tons or less), in addition to the above could be sent from the Baltic to operate off our east and southeast coasts."<sup>1</sup>
36. The disposition of enemy forces between the Bight and the Bay of Biscay (inclusive) was as follows:<sup>1</sup>

	<b>Heligoland Bight Ports</b>	<b>Den Helder to Dieppe</b>	<b>Le Havre</b>	<b>Seine Bay</b>	<b>Cherbourg and Channel Islands</b>	<b>Channel Islands to Brest</b>	<b>Biscay Ports</b>
U-Boats	--	--	--	--	--	20	35
DD's	--	--	1	--	--	--	5
Torpedo Boats	--	--	4	--	--	--	--
E-Boats	--	30	--	--	17	--	--
R-Boats	10	55	--	5	--	--	--
"M" Class M/S	20	20	1	--	3	15	50
German LCG's	4	30	7	8	3	--	--
Spernbrechers	8	3	--	--	--	8	15
M/S Trawlers	--	30	10	12	--	--	--
Patrol Vessels	--	4	8	20	--	--	--
Harbor Defense Craft	10	15	--	45	--	--	--

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37. Admiral Ramsay made the following estimate of the probable enemy naval reaction to NEPTUNE:<sup>1</sup>
- "Once it is clear that invasion is taking place, it must be expected that the enemy will expend his forces ruthlessly in attempting to defeat it. His cruisers and larger ships may make diversionary sorties into the ATLANTIC, but their use in the Channel area is unlikely except as a desperate measure. His light surface forces will probably be used as directly as possible against the assault. They will probably be concentrated in the Channel and southern NORTH SEA area. These forces will probably restrict their attacks to the dark hours and periods of low visibility, operating on the flanks.
  - His U-boats will probably be concentrated rapidly in the Channel and its western approaches and operated without regard to losses. In order to maintain the threat to the ATLANTIC shipping routes, U-boats from NORWAY and the BALTIC could relieve those moved into the Channel by about D plus 14 day.
  - Evidence of Midget U-boats or fast small submersible craft is accumulating and (March, 1944) a small number may have reached the operational stage.
  - Offensive and defensive minelaying by enemy surface vessels and aircraft is probable. New types of mines may be used." Mine laying was considered to be the enemy's most dangerous naval weapon.<sup>2</sup>

### G. German Air Forces

37. The first line strength of the German Air Force on the Western front on D-Day was expected to be about 1,515 aircraft disposed as follows:<sup>1</sup>

	<b>Long-Range Bombers</b>	<b>Bomber Recce.</b>	<b>Tactical Recce.</b>	<b>Fighter Bombers</b>	<b>Twin-Engined Fighters</b>	<b>Single-Engined Fighters</b>	<b>Coastal</b>	<b>Total</b>
West and South of the Seine to 46° N.	70	35	10	--	25	45	--	185
East of the Seine and Belgium	70	10	--	30	185	65	--	360
Holland	--	10	--	--	95	30	--	135
Northwest Germany	200	10	00	35	245	210	35	735
Denmark and Norway, South of Trondheim	--	10	--	--	10	40	40	100
<b>Total</b>	<b>340</b>	<b>75</b>	<b>10</b>	<b>65</b>	<b>560</b>	<b>390</b>	<b>75</b>	<b>1,515</b>

- a. The close support force, available from this total for operations in the NEPTUNE area, was estimated at 590 aircraft, consisting of:

<b>Long-Range Bombers</b>	<b>Recce Bombers</b>	<b>Fighter Bombers</b>	<b>Twin-Engined Fighters</b>	<b>Single-Engined Fighters</b>	<b>Total</b>
320	10	65	75	120	590

- b. The 320 long-range bombers included about 90 specialized (anti-shipping) aircraft, fitted for launching torpedoes and glider or FX radio-controlled bombs. These 90 might also be

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augmented by a further 60 aircraft at a later date, as an expansion of this force was known to have been made.

- c. The above figures represented the maximum which the German Air Force would be likely to commit directly against NEPTUNE. The bulk of the remaining fighter force would be reserved for the day or night defense of Germany and of bases and communications in the west.

38. A part of the long-range bomber force was expected to be used before NEPTUNE, for sea mining operations off the South and South East coasts of England. These operations were likely to be intensified when the Germans appreciated that preparations for a cross-channel operation were well advanced. Such operations would, however, be at the expense of the long-range bomber effort against targets in the United Kingdom. The maximum scale of effort, which the Germans were likely to expend during the three weeks before the operation began, was estimated to be the following:

Sustained, per night	25 sorties
Intensive, per night for 2/3 nights per week	50/75 sorties
Maximum in one night	100/150 sorties

39. The German bomber force was expected to operate mainly at night. In the early stages, however, a few daylight operations might be made, probably at first and last light. As this bomber force had had no experience of day operations, its efficiency in such operations was expected to be very low. The morale of the German bomber crews was slowly deteriorating. The single-engined fighter force was expected to be used mainly in a defensive capacity against Allied air forces and as escorts for day bombers and fighter bombers. A proportion of both single and twin-engined fighters were capable of operating as fighter bombers or as ground attack aircraft, by daylight and possibly by moonlight. A proportion of the German single-engined fighters, equipped with rocket mortars, were available for attacking Allied landing craft, small shipping, and ground forces. Pilots, however, would lack experience and operational efficiency. Some of the German twin-engined fighters, with fighter escort, were also available for anti-shipping and ground attack duties.<sup>1</sup> The German air forces enjoyed one important advantage over Allied air forces. Their airfields were located much nearer the assault area than those of the Allied air forces.<sup>1</sup>

## **PART 2**

### **CONSIDERATIONS RELATIVE TO THE NEPTUNE PLAN**

#### **A. Basic Principles of the NEPTUNE Operation**

40. The German system of coast defense was based on three basic principles:
  - a. to defend the coast line with strong emplaced positions and static garrison troops;
  - b. to hold a central reserve of high-class mobile divisions with which to launch a counter-attack as quickly as possible; and
  - c. to deny the allies access to ports so that their initial assault would wither and die for inability to build up forces or to support those already landed.
41. The allied plan to overcome this system of defense, in broadest outline, was:
  - a. to make unnecessary the immediate seizure of a major port, by providing an alternative method for discharging the necessary tonnage, personnel and vehicles over the beaches during the first stages of the land battle;<sup>1</sup>
  - b. to launch the assault against the weakest spot on the enemy coast line within range of air and naval capabilities without regard to its situation in relation to a major port;
  - c. to overcome the danger of the enemy mobile reserves,
    1. by assaulting and building up with sufficient strength and speed to be able to meet them,
    2. by impeding enemy movement into the battle area through disruption of their lines of communications, through air bombarding and through guerrilla activity of the local resistance groups,

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3. by inducing the German High Command to delay moving reserves into the NEPTUNE area, either by military operations, or by the threat of military operations, on other sectors; and to attack with maximum force and with the greatest attainable violence.

## **B. Beaches and Lodgement Areas.**

41. The lodgement area, required for operation NEPTUNE, may be described as an area containing sufficient port, or other discharge facilities to permit the build-up and maintenance of a force of some 30 divisions, and to make it possible for that force to be augmented, by shipments direct from the United States or elsewhere, at the rate of 3 to 5 divisions per month. Moreover, it had to be an area from which further offensive operations could be developed. The selection of the lodgement area had to be made by balancing logistic, strategic, tactical, naval and air considerations.
42. The governing air considerations were:
  - a. the assault beaches and the convoy lanes had to be situated within range of effective air cover;
  - b. the lodgement area was required to contain, in the immediate vicinity of the assault beaches, air fields, or sites upon which air fields could be rapidly constructed, adequate for basing allied planes in strength over the assault area, very soon after the initial assault;
  - c. the assault beaches should not be so widely separated from one another that decisive allied air superiority would be dissipated in protecting them;
  - d. the assault beaches should not be situated near German centers of air strength, which would place the allied air forces, operating at a distance from their U.K. bases, at a decisive disadvantage.
43. The governing naval considerations were:
  - a. an operation in the English Channel (viz west of Calais) would be less liable to interference by enemy cruisers and destroyers than an operation in the North sea (viz east and north of Calais);
  - b. an operation in the English Channel or in the North Sea would require a much smaller number of anti-submarine escorts of ocean-going types (which were in the greatest demand elsewhere), than an operation on the west coast of France. It would also use the minimum of ocean-going shipping.
  - c. an operation east of Calais would demand a much heavier minesweeping effort than one in the Channel, but not necessarily an impossible one; enemy ships coming coastwise from Germany and using their own searched areas and swept channels, would have an advantage over Allied ships operating in unknown waters as regards minefields.
  - d. the naval difficulties of an assault on the west coast of the Cotentin Peninsula, or on the north coast of Brittany, would be greater than elsewhere. As regards the former, it would be essential to have first captured or completely neutralized the island of Alderney; and the prior capture of Guernsey might also become equally essential, if it were desired to land and maintain considerable forces on the West Cotentin beaches.
  - e. operation against the west coast of France would necessitate the use of use of ocean-going shipping in an area very exposed to submarine attacks, while the proximity of the Biscay U-boat bases would make the anti-submarine escort commitment a heavy one.
  - f. from the naval point of view, therefore, the best area for an attack appeared to be between Cherbourg and Calais. Operations elsewhere would be undesirable but need not be ruled out, if other considerations dictated the selection of the assault area.
44. Strategical considerations required:
  - a. that the lodgement area should afford the invading allied armies a readily defensible position against enemy counter-attack during the build-up phase;
  - b. that the boundaries of the lodgement area should not provide the Germans with an easily defensible position against an allied break-through, but should permit further offensive operations to be readily launched, after the build-up was completed;
  - c. that the assault beaches should be sufficiently close together to be mutually self-supporting; that German beach defenses in the assault area selected should not be too strong for the weight of available allied fire power and assault power;
  - d. that the assault beaches should not be near major concentrations of German mobile reserves, but should be so situated, if possible, to permit the advance of such reserves to the assault area to be effectively impeded.
45. Logistic considerations were:

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- a. the beaches selected would have to be capable of maintaining and building up the assault forces in strength during the preliminary phases;
  - b. ports would have to be available or, alternatively, beaches of such a capacity that the necessary tonnages of personnel and vehicles, could be discharged from a very early date;
  - c. the build-up would have to be relatively independent of interruption, by either weather or enemy action;
  - d. the lodgement area, taken as a whole, must contain ports of sufficient capacity to maintain an army of at least thirty divisions and to provide for landing reinforcements at the rate of 3 to 5 divisions per month, without the necessity of relying on discharging over the beaches, once the whole lodgement area was captured.
46. On making a study of port capacities, COSSAC found that there were six areas containing ports of sufficient capacity to support an army of thirty divisions. These were:

Sectors	Daily tonnages through ports		
	On opening	30 days after opening	90 days after opening
Dunkirk-Rotterdam ...	10,000	16,900	24,300
Boulogne-Antwerp ...	8,850	16,100	23,500
Rouen-Calais ...	7,650	13,600	20,750
Cherbourg-Dieppe ...	10,200	16,100	24,950
Nantes-Caen ...	9,800	19,500	28,000
Bordeaux-Brest ...	9,400	17,500	24,250

47. The Allied air forces, based on the U.K., could not give adequate air cover to an assault in areas west of Cherbourg, nor north of Flushing. Therefore, the regions which did not have suitable beaches in the area between Flushing and Cherbourg were ruled out at once. A study of beaches, within this sector of the coast, showed that:
- a. The Dutch beaches, though extensive, were unsuitable for beach maintenance on a large scale, as they had limited road exits, insufficient tide range to dry out coasters, and were exposed to the prevailing wind. This sector was, in fact, only suitable for subsidiary operations;
  - b. beaches in the Belgian sector, and in the Pas de Calais sector south of Boulogne, had a high capacity, but was exposed to the prevailing wind, were backed by extensive sand dunes, and south of Boulogne, were overlooked by high ground inland;
  - c. beaches in the North Seine sector were relatively few and small, were widely separated, and in all cases were flanked by high cliffs. Certain of these beaches, which were excellent from a naval point of view because of their steep gradient, had poor exits. This sector was, in fact, only suitable for subsidiary operations. The beaches in the South Seine sector, although of relatively high capacity, were completely covered by guns from the Havre Peninsula;
  - d. beaches in the Caen sector were of very high capacity and were reasonably sheltered from the prevailing wind;
  - e. beaches in the Cotentin Peninsula had a fairly high capacity, but about half of them, on the western side of the peninsula, were fully exposed to westerly weather and to the Atlantic swell;
  - f. the Brittany Peninsula contained many small, well-sheltered beaches, which were too small and too scattered for an assault by a large force, but could be useful for maintaining forces advancing to clear the Brittany Peninsula from a bridgehead established elsewhere.
48. Beach capacities and air considerations therefore pointed either to: (1) the general area of the Pas de Calais, or (2) the Cotentin-Caen area, as the most favorable for the initial main landings. In order to obtain the requisite port facilities in the Pas de Calais area, subsequent operations would be required to capture either (1) the Belgian group of ports, or (2) the Seine group of ports. From the

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Cotentin area, subsequent operations would be necessary to capture either (1) the Brittany group of ports, or, (2) the Seine group of ports.

49. The Pas de Calais area offered certain obvious advantages for an attack. Its proximity to the English coast would ensure maximum air support from aircraft operating under the most favorable conditions. The short sea routes would facilitate a rapid turn round of craft and shipping and would greatly lighten the burden of naval escort and protection. The short distance to be covered would also make for ease and efficiency of signal communications, and would facilitate the maintenance of supplies. It was obvious, however, that the Pas de Calais area presented obvious and probably insuperable difficulties, such as those indicated below:-
- a. This region was the most strongly defended area of the French coast. It had become a pivot of the German coastal defense system, which could be captured only after a prolonged prior bombardment, which would cause such damage as would add to the already formidable obstacles. Penetration of the defenses could be slow and costly. Landing forces would be subject to heavy and continuous enemy counter-attack. The odds were thus heavily against the success of the initial assault, the physical factors being heavily weighted in favor of the Germans.
  - b. Even if a bridgehead were obtained in the Pas de Calais in spite of these difficulties, the immediate capture of Boulogne and Calais would be imperative. The beaches of this region were completely exposed to the full vigor of the weather and maintenance across them would be subject to serious interruption in bad weather. These two ports could, after repair, maintain nine divisions, or possibly, with improvisation, twelve divisions. The bridgehead would then have to be extended eastwards or south-westwards to include more ports.
  - c. An extension eastwards could not give the requisite port capacity, unless all the ports up to and including Antwerp could be taken. This would involve operations across numerous river obstacles and areas liable to inundation, combined with successive landings, to secure and open each port in turn. It would be a slow process, amounting to a march across the front of the German forces. The allied forces would be constantly in a situation not dissimilar to that which prevailed towards the end of May 1940. It would, therefore, be a hazardous and unsound operation, unless the Germans were weak and not far short of collapse.
  - d. An advance south-westwards would be fraught with even greater hazards. The first port to be reached would be Dieppe, over seventy miles distant, while the capture of Le Havre and Rouen, fifty and twenty-five miles further on, would entail holding both banks of the Seine. Such an advance would hardly be conceivable unless the German power to interfere was negligible.
  - e. Despite its great advantage, as the area where optimum air cover could be obtained, the Pas de Calais region did not, therefore, offer possibilities of expansion, within the strategic capacity of the forces available, to secure the additional ports necessary. This area was, however, important as an objective for feints and diversions, and for large-scale landings in case a major change should take place in the German capacity to defend it.
50. The Caen-Cotentin Area contained many suitable beaches, those in the bay of the Seine being moderately well sheltered from the wind. In this area, the initial assault could be launched either (1) on the Cotentin Peninsula only, or (2) on the Caen beaches only, or (3) on the south east Cotentin beaches and the westerly Caen beaches.
- a. An initial assault on the Cotentin Peninsula would necessarily be confined to the East coast unless the Island of Alderney could be previously reduced. Such a prior assault on Alderney would absorb an appreciable but not undue proportion of available assault forces and would vitiate the factor of surprise in the main undertaking.
  - b. An attack on the east coast, in combination with an air-borne assault to capture, and hold the neck of the Peninsula, on the other hand, would ensure the rapid capture of the Peninsula and the port of Cherbourg. With the forces available, an attack on the Peninsula had a reasonable chance of success. It would secure a large port early in the whole operation and would provide a few forward airfields for a subsequent advance. The neck of the Peninsula would provide an easy line of defense for forward troops, while the main bulk of the army was being built up.
  - c. Unfortunately, it would provide the Germans with an equally easy task in preventing the further expansion of the bridgehead. Furthermore, the time taken to capture Cherbourg would give the enemy ample time sufficiently to reinforce his coastal troops in the Caen sector as to render a subsequent amphibious assault in that area very much more difficult.

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- d. For these reasons, an initial assault on the Cotentin Peninsula was considered unlikely to enable the Allies to achieve the ultimate object.

51. **The Caen sector**, from the River Vire in the West to the River Dives in the East, presented also both advantages and difficulties:

- a. Over a front of fifty miles, this sector was held, in 1943, by only one German defensive division. The defenses, including coastal artillery, in this sector, were light.
- b. Large beaches, within reasonable supporting distance of each other, provided sufficient facilities for the simultaneous landing of three divisions. Inland there were favorable features for forming the initial bridgehead, and, except for an area between Caen and Bayeux, the ground was very unfavorable for counter-attack by panzer divisions.
- c. This sector, in fact, provided the best prospect of any part of the French coast for a rapid break through the initial coastal crust, for the subsequent engagement with the German reserves, and for the rapid build up of sufficient force to defeat those reserves.
- d. It suffered from the great disadvantage that it would require a very great fighter effort to provide adequate cover. On the other hand, it provided more suitable ground for the rapid development of forward airfields in immediate proximity to the coast.
- e. Finally, an attack in this sector would not permit the capture of the port of Cherbourg as quickly as a direct attack on the Cotentin Peninsula. Nevertheless, if the required air situation could first be achieved, the chance of a successful attack in adequate strength and of subsequent rapid developments to achieve the ultimate object were so much greater in this sector than in any other that it was considered that its advantages outweighed the disadvantages. It seemed unwise in principle to disperse the initial assault forces by making simultaneous attacks in widely separated areas. Simultaneous landings, on both the Cotentin Peninsula and on all the Caen beaches, would involve the risk of defeat in detail and would give fighter support an impossible task. To overcome this latter difficulty, it might be possible to land both on the Southeast beaches of the Cotentin Peninsula and on the most westerly beaches on the Caen sector. The forces so landed, would be separated, however, by the low-lying country and river systems, in the area of Carentan-Isigny, and would not be mutually supporting. Moreover, the area was not suitable for the development of air-fields. During the COSSAC phase of OVERLORD planning, when the assault lift limited the scale of attack to three divisions, these considerations were considered decisive, and the danger of separating the small spearhead forces unacceptable. But a necessary implication was the serious delay in the capture of the first major port, Cherbourg.

52. The decision taken early in 1944, to make a five-divisional lift available, assured the possibility of an assault on the base of the Cotentin without reducing the strength on the other beaches, while at the same time assuring a speedier capture of Cherbourg.<sup>1</sup> It was then decided that the assault should be launched on four beaches along the westerly Caen coastline and on one beach at the base of the eastern shore of the Cotentin Peninsula. The first objective of the western (U.S.) forces, landed on the two most westerly beaches, would be the capture of Cherbourg. After the capture of Cherbourg, and depending on the German position, the Allies would proceed to the capture, either of the Brittany area and ports, or of the Seine area and ports, for the lodgement area. The appended sketches illustrate COSSAC's conception of the development of the land campaign, up to and including the capture of Cherbourg.

### **C. Anticipated Development of the Land Campaign**

53. The invasion armies, after the capture of Cherbourg, would have to complete the capture of the necessary lodgement area, including the required port capacities. The Supreme Commander would then have the choice between capturing either the Seine Group of ports or the Brittany group of ports. The probable action of the enemy, after having been defeated in his first attempt to concentrate reserves to drive the Allied forces back into the sea, would be to withdraw his main forces to cover Paris, while holding the line of the River Seine with such defensive formations as could be drawn from the interior. Some German forces would probably also be regrouped to delay allied advances towards the Loire ports and into the Brittany Peninsula. To secure the Seine group of ports, the allies would have to force the line of the Seine, capture Paris, and advance as far North-East as the Somme. An early advance with this object could be made with only a relatively small proportion of the Allied forces and would run grave risks of being defeated in detail.

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54. The allies would therefore be compelled to pause until communications were being properly established, until essential airfields were being restored or built and put into operation, and adequate bridging material had been landed and sent forward. With the only major port in allied hands (Cherbourg) requiring several weeks of repairs before it could be in full operation, the pause could be expected to be a lengthy one, at the end of which the forces, which could be maintained, would probably be insufficient to undertake so large an operation. During this pause, however, and under cover of the main body, a proportion of available forces might be able to capture the Brittany Peninsula and open its ports (including the Loire ports). This would provide sufficient port facilities to supply a force adequate to capture Paris and force the line of the Seine.<sup>1</sup> In the period following the capture of Cherbourg, an immediate advance to capture the Seine ports, in preference to the Brittany ports, would be feasible and sound, only if Germany was on the point of final collapse, or if the German forces were being forced to withdraw out of France.
55. The lodgement zone selected by COSSAC was, accordingly, the area comprising the Cherbourg and Brittany group of ports. This area would support a force of thirty-one divisions, after one month's development, and a force of forty-five divisions after three months' development. Given suitable conditions, it was estimated that the Cotentin-Caen group of ports should be in allied hands in fourteen days, and the Brittany group in six to eight weeks. An advance towards the line of the Somme, to capturing Paris and the Seine ports, could then be undertaken, within the limit of 150 miles of M.T. maintenance, by forces based on the Cherbourg group of ports. If forces based on the Brittany group of ports were to be required, a minimum length of 100 miles of rail communications would have first to be opened. For planning purposes, therefore, COSSAC selected this area, but he expressly left open the alternative of striking for the Seine area and ports, at the appropriate moment, should the Supreme Commander find, that the German position was then such as to make such a course of action feasible. Any advance beyond the Somme and Paris would be dependent on the restoration of rail facilities in the lodgement area to the extent required to permit M.T. maintenance not to exceed 150 miles. The development of the land campaign, after the capture of Cherbourg, as anticipated by COSSAC, is illustrated in the appended sketches.

#### **D. Method of Amphibious Attack for NEPTUNE**

56. The broad outline of the NEPTUNE plan for initial campaign was thus:
- a. To capture by assault the Normandy beaches;
  - b. To advance landward and occupy successively Caen, Cherbourg and the Brittany Peninsula as far as Nantes;
  - c. To support the advance, initially by landing maintenance, and build-up over the beaches only, but later, not only over the beaches, but through the port of Cherbourg;
  - d. To open the Brittany and Normandy groups of ports to support the further advances, independently of the beaches.
57. In this program the first phase would be the establishment of the spearhead on the Normandy beaches. How was amphibious action to be organized? An amphibious assault is a combined Army-Navy-Air operation in which the object of all three services is to put forces ashore to win the land battle which the army has then to fight. Any three service plan must therefore be based on the army's plan of attack. The basic naval task in an amphibious operation is to deliver the Army spearhead at the assault beaches in combat array and to support the Army's battle plan with naval gunfire and other action. Thereafter, the naval mission is that of delivering Army reinforcements and supplies, at the times and places and in the sequence, required by the army's battle plan. In operation NEPTUNE all Naval operations were geared to fit the Army's plan of attack.
58. The Army's plan of attack was based on the "normal doctrine" of amphibious assault modified to meet the requirements of the special situation envisaged by the NEPTUNE plans. The "normal" army formation for an amphibious assault would be the division, strengthened by the addition of special troops, beach engineers, special artillery, and so on. The total strength of this reinforced "amphibious" division is about 20,000 men. The naval formation transporting and supporting a reinforced "amphibious" division, is a Naval Assault Force. The amphibious division is "normally" composed of three regimental combat teams (R.C.T.)<sup>1</sup> made up of a normal infantry regiment, specially reinforced with beach engineers, special artillery, special motorized units and so on. The naval formation for transport and support of an R.C.T. is an assault group. Each R.C.T. is further broken down into three battalions while the corresponding naval formations would be the assault "unit". The battalion in turn is composed of three companies, each of which is associated with a "wave" of small naval boats, or one or another sort of Naval landing craft, as the situation requires. The division would "normally" assault with two regiments attacking adjoining beaches, with the third

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regiment held in reserve to exploit success on whichever beach that appears to be the most promising. Each of the leading regiments similarly attacks on a two battalion front; each battalion on a two company front. This system of attack is often described as a divisional assault on a four battalion front. Appended sketches illustrate this method.

59. The NEPTUNE assault was to be executed by 5 divisions, attacking approximately simultaneously. Had the "normal" assault formation been employed this would have called for simultaneous assaults on a 10 R.C.T. (Brigade) front. But there was assault lift available for landing simultaneously only 5 R.C.T. The normal system had therefore to be modified to some extent, as is illustrated in the following description of the attack plans of the 5 assault forces.

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- c. **Force G.** The landing force of Force G consisted of the 50th (Northumbrian) division of the XXXth Corps of the British 2nd Army. Two Brigade Groups (the 231st and the 69th Infantry Brigade Groups) attacked, each on a two-battalion front on GOLD Beach near Asnelles. The follow-up was a new formation.
  - d. **Force J.** The landing force of Force J consisted of the Canadian 3rd Division of the 1st Corps of the 2nd British Army. Two brigade groups attacked JUNO beach near Courseulles. The 7th Canadian Infantry Brigade assaulted on a three-battalion front and the 8th Canadian Infantry Brigade on a two-battalion front. The follow-up was a new formation.
  - e. **Force S.** The landing party of Force S was the 3rd division of the 1st Corps of the British 2nd Army. One Brigade Group (8th Infantry Brigade) attacked on a two-battalion front on SWORD beach near Ouistreham. The second Brigade followed immediately behind, and the third brigade arrived on the 2nd tide.
60. This method of the assault proceeded according to this plan, would provide for army formations arriving on the Far Shore, with their basic organization intact. If, for example, the "O" landing party had attacked with two R.C.T. of one division, while using forces from a separate division to follow in over the same beaches, regrouping would have been necessary after landing, to reestablish the divisional order of battle. As it was, each division and each corps was to land during the period of assault, follow up and build up, in accordance with the planned order of battle.
61. The main burden of cracking the German coastal defenses developed on the assaulting army formations which were to land in the order just described, with the assistance, however, of naval and air support to be made available. The order of events during the initial landings was envisaged in general, as follows:
- a. During the last 40 minutes, before the first wave of infantry hit the beach (that is before H-hour), the Navy and the Air Force were to drench the landing beaches with the maximum weight of fire power, employing all manner of ships, craft, and special weapons, in this bombardment;
  - b. Leading the infantry onto the beach, DD tanks<sup>1</sup> were to land at H minus 10 minutes;
  - c. Behind the DD tanks, landing at H-hour, were to be more tanks (medium sized), borne in special landing craft, LCT(A)'s, which were so constructed that the tanks could begin firing while still aboard.
  - d. Behind the L.C.T.(A)s, and landing at H plus one minute, the first waves of infantry were to be landed in L.C.V.(P)s, or other very small landing craft types;
  - e. Behind the first waves of Infantry, and landing at H plus 3 minutes, were Naval Combat Demolition Units. These were to clear paths through the German beach obstacles. H-hour was so timed that the tide would be one to two hours below the outermost row of obstacles. The NCDU were to clear several paths through these obstacles, by working on the exposed open beaches against the time allowed by the rapidly rising tide.

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

- f. Behind the NCDU's, more infantry, more tanks, light artillery, beach equipment, and all the other accoutrements of war, were to land in successive waves in accordance with the general pattern of the army attack plan described above. The accompanying sketches, taken from the Operation Orders of Force S, show a typical naval deployment for a landing on a two battalion front.

## **E. The Timing of the NEPTUNE Assault**

62. The time originally selected for the assault was May 1944. There were three reasons for selecting May:
  - a. The weather in the channel would normally be unsuitable for amphibious landings on the French coast prior to approximately 15 April;
  - b. It was desirable to open the operation as early in the season as possible, to give the army the longest possible stretch of good weather for campaigning on the far shore;
  - c. At the EUREKA conference, the promise had been made to the Soviet Staff that the operation would be launched during the month of May. The Russian High Command had made a reciprocal promise that they would open a major offensive in the East at the same time, to prevent the Germans from diverting forces from Russia against NEPTUNE. The original target date had therefore been 1 May. When it was decided in March to increase the scale of the assault from a three division to a five division basis, the target date was postponed for a month, as 1 May was too early to permit the assembly, training and preparation of the additional two assault forces.
63. The selection of the time of day for the assault involved the balancing of several requirements. From the Naval point of view, it was desirable that the sea approach to the enemy shore should be made during darkness but it was also preferable that the assault should be made during daylight. Darkness was required during the approach, to prevent the Germans from employing usual observation for their guns during the period of several hours when oncoming forces, and especially the minesweepers, would be within range of German coastal batteries.<sup>1</sup> Daylight was required before H-hour:
  - a. to allow bombarding forces a period of at least 40 minutes of pre H-hour aimed counter battery bombardment;
  - b. To achieve the density of landing envisaged by the army; and
  - c. Give time for clearance of the beach obstacles which the Germans had installed along the beaches.
64. From the army point of view, on the other hand, it was preferable that the main assault should take place just before dawn, in order to obtain darkness during the first crossing of the beaches, and daylight for the capture and exploitations of beach defenses. Airborne forces could be landed by day or night, but if they were landed by night a quarter moon was required. Gliders required daylight for the take off; dusk or darkness for the landing. It was therefore essential to land the paratroops at night and to land the main glider borne forces in the early hours of daylight. From the air point of view, daylight was not required for preliminary saturation bombing, but was essential for the beach drenching bombing, required immediately before the assault.
65. The time of assault had also to be established with reference to tidal conditions.
  - a. From the army point of view, it seemed advisable to land on an incoming tide near high tide with two high tides during daylight, the follow-up forces could be completely discharged before darkness of D-day; and the time required for the soldiers to cross the exposed beaches would be reduced to the minimum.
  - b. From the naval point of view, on the other hand, first landings near low tide would permit the first wave of landing boats to beach below the outer most obstacles, and the obstacle clearance parties would then have an opportunity to clear obstacles off the beaches dry shod.
  - c. The timing of H-hour was also affected by the condition of the tide around the Calvados Rocks, which lay off Juno Beach. At low tide, there would not be sufficient depth of water to permit the assault boats to pass over them. A rising tide, and sufficiently high water was required for their passage.
66. After taking into account all these factors, it was decided that H-hour should be between one to three hours after extreme low tide, and 30 minutes to 135 minutes after civil twilight (dawn). The differences in the gradients of the eastern and western beaches, and the existence or a greater tidal area on the Western beaches which accommodated more rows of beach obstacles, made it seem necessary to set H-hour for different times for the various forces. In the U.S. (Western) sector H-

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hour was set for shortly after the turn of the tide. British Forces G and S set their H-hour about an hour later, while Force J, which had the Calvados rocks to contend with, set its H-hour an additional 25 minutes later.

67. It was necessary also that D-day should be a day when the conditions, above described, prevailed, following a night with not more than half moon. There would be only six days during the month of June when all these conditions would be fulfilled. These were: (1) the 5th, 6th and 7th of June; and (2) the 18th, 19th and 20th of June. D-day was, therefore, to be designated on the first of these six days, during which the weather would be suitable for landing.<sup>1</sup> The requirements with regard to the weather were as follows:
  - a. The Navy required a day on which the wind should not exceed Force 3 onshore or Force 4 offshore, when there would be a minimum of swell in the channel with visibility not below 2 miles.
  - b. The air force required a day on which the cloud base should not be below 1,000 feet, nor the cloud tops above 5,000 feet, with 6/10th visibility and no fog.
  - c. The army required that the weather preceding the landings should be sufficiently dry so that the movement of Heavy Vehicles brought ashore would not be clogged by mud.
68. It was therefore obvious that the probability of all these weather requirements being met on any one of the six possible days of landing in June 1944 was extremely remote. NEPTUNE sailings were required to begin on D minus 6, but as weather could be predicted only 24 hours in advance, the operation would have to be set in motion on the **assumption** that while a designated day would be D-day, the operation would have to be postponed if the weather at H minus 24 was predicted for D-day as unsuitable. The postponement plan provided that, if the operation were to be postponed for one day or two days, the new D-day H-hour would be promulgated by radio. All vessels at sea would then backtrack along their previous route of advance. When they had lost sufficient time, they would face around and advance on the new time table. Small craft would, if possible, make for the nearest port. These were designated in advance to avoid confusion in restarting. Delivery of the postponement signal would be reinforced by destroyers intercepting the routes of advance. In case of a one or two day postponement, personnel and equipment would not disembark. If the operation were to be postponed until the next tidal lunar period, vessels would backtrack to their original mounting ports and disembark personnel but not equipment.

## F. Plans for Movement of Forces

69. Throughout the operation certain broad principles were to be observed in the movement of the Allied Expeditionary Forces. Among these were:
  - a. In the general movement of the allied armies from England, France and later on into Germany, the American forces were to be kept on the right, and the British, on the left. The American army was to be assembled in western England and were to be loaded into American ships in the western ports of the English south coast. The American forces would cross the Channel by land on the western beaches and would advance inland on the western, and later the southern, flank. The British army was to be assembled in eastern England and embarked in British ships from eastern channel ports. It would cross the channel through the eastern convoy lanes, would assault the eastern Normandy beaches and would advance inland on the eastern, and later the northern, flank. During the assault phase, the line dividing the British and American zones in England was at Poole. During the build-up phase it was at Southampton, both forces using the facilities of that port.
  - b. The assault forces were to be loaded and assembled as nearly opposite the assault beaches, as port capacities in Britain would allow. Follow-up forces were to be loaded and assembled further on either flank, and the preloaded first follow-up force still further out. After the assault forces had sailed, the build-up would pass through the southern English ports.
  - c. Each assault force, and its sub-divisions were to be loaded, assembled and sailed in the same east to west order as they assaulted; Force 'U' being in the extreme west; Force 'O' next, then, from west to east Forces 'G', 'J', and 'S', the latter on the extreme east. Each force and sub-division was to be kept together as far as possible, during the loading, assembly and sailing phases.
  - d. In preparation for embarkation, the formations, equipment and stores were in general to be assembled in England, in marshalling areas behind the ports from which they were to sail, and in the order that they were to arrive on the far shore. As the build-up progressed, the

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army could therefore move forward step by step. By D minus 30, the assault formations, scheduled to move in follow-up and build-up convoys, lay behind the ports from the waters edge **inland** and marshalled in **approximately** the order they were to arrive on the far shore during the first 30 days.

- e. The general principle to govern the routing of sea borne movements was that all shipping was to skirt the British shoreline toward a converging area (Area Z), which was to be due north of the assault beaches, whence it turn southward, across the channel, through specially prepared routes.
- f. Within each convoy, ships were to be stationed in the order that they were required to occupy when they arrived off the beaches.

## **PART 3 GENERAL PLAN FOR THE NORMANDY LANDINGS**

### **A. The General Plan for the Normandy Landing**

The execution of NEPTUNE was divided into four phases: (1) The Preliminary Phase (2) The Preparatory Phase (3) The Assault and, (4) The Build-up.<sup>1</sup>

70. During the preliminary stage, which began almost as soon as the COSSAC plan was approved, all possible means, including air and sea action, propaganda, political and economic pressure, and cover and deception, were to be integrated into a combined offensive aimed at softening the German resistance in general and German strength in Normandy in particular.<sup>2</sup> Air action, especially, was to be directed toward the reduction of the German air forces on the Western Front, the progressive destruction of the German economic system and the undermining of German morale. Diversionary operations and deceptions were to be staged in other areas to divert and contain German Forces away from Normandy.

### **B. The Preparatory Phase**

71. The air force was the principle weapon available, during the months before D-day, capable of being used for offensive operations to reduce the future operational possibilities of the enemy. During the preparatory phase, the air force, therefore, was to direct its effort towards producing a situation on the continent favorable for the success of NEPTUNE.

- a. It was essential that the fighting value of the German Air Force and its capacity for intensive and sustained operations should be reduced as much as possible before the decisive air battle was joined. Operation POINTBLANK, as main means of achieving this, was to be developed to the maximum extent possible.
- b. The delay and disorganization of rail reinforcements into the assault area could not be assured, as required by the Army, by the cutting of specific lines during the later stage of the preparatory phase. Many of the essential transportation targets would have been unsuitable for air attack, and it was doubtful if sufficient air resources would be available. Moreover, disruption of specific lines of transport might have disclosed the point of attack.
- c. The only practicable method of achieving this objective was to impose a general reduction on the whole enemy rail movement potential over a wide zone extending northwards from the general line of the Seine. This involved attacking a very large number of rail centers over a considerable period of time, to bring about a general paralysis of the railroad system.
- d. CROSSBOW sites (Robot and Rocket Bomb launching sites) were also to be attacked in order to prevent these weapons from endangering allied concentration areas, and to prevent them from diverting allied air forces during the course of the invasion.

72. One of the most important tasks of the Allied Air Forces during the Preparatory Phase was the intensification of the offensive against the German Air Force, both in the air and on the ground. The degree of Allied Air superiority over the lodgement area would be dependent to a large extent on the success of these operations. This offensive was to be divided into two stages:

- a. Concentrated attacks against servicing, repair, maintenance, and other installations, with the intention of reducing the fighting potential of the enemy air forces;

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- b. Attacks designed to render unserviceable all airfields within 130 miles of the assault beaches, in order to drive the German Air Force units far enough back so that they would have lost the advantage of disposition over allied fighter forces operating from the UNITED KINGDOM.
- 73. Long range air penetrations into enemy and enemy occupied territory was to be continued as long as possible, not only to maintain the level of internal disorganization and loss of morale, but also to contain the maximum possible number of German fighters in Northwest Germany. Air attacks were to be made on enemy supply dumps, M.T. concentrations etc. as required. During the preparatory phase, air forces were also to be employed in:
  - a. Attacks on enemy E-boats, Destroyers and U-boats in their bases;
  - b. Air minelaying operations, and
  - c. Increased Anti-Surface Vessel patrols, and Anti-U-Boat operations.
- 74. Between about D minus 3 and D-day, air attacks on the billeting areas of German divisions, available for counter-attack during the initial stages of the assault, would be made as required by the army. Immediately before and during D-day, air attacks were to be made against the command and control centers of the enemy's ground and air forces, and against their communications. On and from D-day, some proportion of available Allied air effort was to be held in reserve for attacks on opportunity targets, such as troop concentrations, rail and road movements, and to meet unforeseen contingencies.
- 75. About six weeks before the operation, the Naval Assault and Follow-up Forces were to begin to move to their assembly stations, which extended from the Thames to FALMOUTH inclusive. This concentration was to be completed by about D minus 7. Additional Naval forces were to be introduced into the CHANNEL area during this period, to arrive only shortly before D-day, to reduce, as far as possible, the strain on administrative arrangements on the South Coast of England.

### C. Assault Phase

- 76. After being loaded and assembled, the Naval Assault Forces and the Naval bombarding forces were to sail in groups as necessary, from their assembly point towards a general area Southeast of the Isle of Wight (Area Z). Naval escorts and minesweepers were to accompany these groups, increased protection being given to first flight L.C.T. and to L.S.I. and A.P.A. The hours of daylight, and the distance to be covered, militated against the possibility of misleading the enemy as to the exact location of allied assaults, but the groups were to be so routed, during daylight on D minus 1, that the chance of a correct enemy forecast of the assault plan would be reduced so far as possible.
- 77. On reaching the enemy mine barrier, minesweepers were to sweep ten passages for the leading groups. Subsequent groups were to follow the same channels, which would then be marked. About seven miles off the French shore, the L.S.I. and A.P.A. were to stop and lower their L.C.A.'s and L.C.V(P)'s. They would then be in close proximity to the first flight of L.C.T. and support craft. All craft were then to deploy for the assault, subsequently adjusting their movements as necessary, so that the first wave of craft would beach at H-hour. Bombarding ships and support craft would take up their position to support the landings at about the same time.
- 78. Fighter aircraft were to give escort to Fighter/Bomber, Bomber and Airborne Forces and to provide air cover over shipping, during the hours of daylight. Fighter cover was also to be provided over the assault area at an average strength of ten squadrons (i.e. five squadrons each over British and United States Beach Areas) and approximately five squadrons over the convoys during the hours of daylight. The strength of fighter patrols, operating over the beaches and shipping lanes, would however, be varied from time to time as required by the air situation. At least six additional squadrons of fighters would always be available to meet emergencies.
- 79. H-hour, defined as the time at which the first wave of landing craft were scheduled to hit the beach, was to be about 1<sup>1</sup>/<sub>2</sub> hours after nautical twilight, and from four to five hours before high water. This would:
  - a. Allow a minimum period of thirty minutes daylight for observed bombardment before H-hour,
  - b. Make possible the maximum number of vehicles to be landed on the first tide, and
  - c. Permit the first landings to be made below the outermost row of beach obstacles.
- 80. Should the operation be postponed, the time of H-hour on successive days would be extended to about 2<sup>1</sup>/<sub>2</sub> hours after nautical twilight. As H-hour was to be related, both to nautical twilight and to high water, the choice of D-day was dependent on the phase of the moon. As D-day should be during the full moon period, as opposed to the new moon period, it had to be fixed for the first week of June, weather permitting. D-day, and the time of H-hour for that day, and for successive days to which a postponement would be possible, was to be notified shortly before the operation. Y-day,

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which was the day on which all preparations were to be completed and the forces ready to sail, was set for 1 June.

81. The NEPTUNE plans also fixed their time-table for the succession of operations which were involved in the landings:
- a. Coast artillery and field batteries were to be engaged by Naval and Air action, starting before H-hour. A joint fire plan was issued listing bombardment targets and priorities. The assault was to be immediately preceded by pre-arranged Naval and Air bombardment of selected points of the beach defenses. Close support was to be provided at call by Naval and Air Forces.
  - b. Rangers and Commandos were to make landings in the NEPTUNE area approximately simultaneously with the main assault. Their action was to be coordinated with the Fire Support Plan, with the object of assuring the early capture of the most dangerous German batteries.
  - c. For the Army, the object of the main assault was the capture of the towns of St. Mere Eglise, Carentan, Isigny, Bayeux, and Caen, by the evening of D-day. The inter-area boundary between British and U.S. Forces was to be: (1) At sea, a line drawn north eastward (025°) from Port en Bessin to the Meridian 0°40' W and thence northward, and (2) ashore, a line drawn generally southward from Port en Bassin.<sup>1</sup>
  - d. The First United States Army was to assault UTAH beach, with one Regimental Combat Team (R.C.T.) between Varreville and the Carentan Estuary. It would also assault OMAHA beach, with two Regimental Combat Teams (R.C.T.'s), between Vierville-Sur-Mer and Colleville-Sur-Mer. After seizing its beachhead the tasks of First United States Army in order of priority were:
    1. To capture Cherbourg as quickly as possible, and
    2. to develop the Vierville-Sur-Mer - Colleville-Sur-Mer beachhead, southwards towards St. Lo, in conformity with the advance of Second British Army.
  - e. The Second British Army was to assault with five brigades between Asnelles and Oistreham. The main task of Second British Army was to develop the bridgehead, South of the line Caen - St. Lo and Southeast of Caen, in order to secure airfield sites, and to protect the flank of First United States Army while the latter was capturing CHERBOURG.
  - f. The over-riding air commitment, in the assault phase, was that of gaining and maintaining air superiority. Subject to this, the maximum possible air effort was to be made available during the night preceding D-day, on D-day, and subsequently as necessary, for the tasks of:
    1. Assisting the Navy to neutralize coast defenses,
    2. helping the land forces in their initial occupation of the bridgehead, and
    3. delaying the arrival of the enemy's immediate reserves and reinforcements.
  - g. One airborne division, under command of First United States Army, was to land in the area behind the Varreville - Carentan beaches with the main object of assisting the seaborne landing. Two airborne brigades, under command of Second British Army, were to land East of the River Orne with the objects of covering the left flank and delaying the arrival of the enemy reserve division from Lisieux. A further airborne division, under command of First United States Army, was to be landed in the Cotentin Peninsula late on D-day or early on D plus 1. Pathfinder aircraft were to drop key paratroop personnel at selected points during the hours of darkness, and were to mark and prepare the Dropping and Landing Zones for the main forces, which would arrive soon after daylight. Special fighter cover and special ground aids to navigation were to be provided for these operations.

## **D. Build Up Phase**

82. The objectives in the Build-up plan were:
- a. The establishment of army reinforcements on the far shore more rapidly than the enemy could bring his reinforcements into the battle zone,
  - b. The basing of air force components on the far shore, to permit them to establish air fields and other ground facilities with the required speed.
  - c. The landing by D plus 3 of the minimum land forces required to meet the expected scale of enemy counterattack, would involve massing effectives;
    1. The First United States Army:- Three Seaborne divisions, plus three or more assaulting tank battalions, and one or two airborne divisions, and

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2. The Second British Army - Four seaborne divisions (including four armoured brigades, three of which were assault armoured brigades) and one airborne division.
- d. The attainment of the planned rate of army build-up as shown on the accompanying table.
83. It was also planned to provide the following facilities for Air Forces by the dates shown:-
- By p.m. on D-day, a minimum of two G.C.I. Stations accompanied by specialised radar equipment for anti-Window purposes;
  - By p.m. on D plus 1, additional G.C.I. units;
  - By a.m. on D plus 3, ground elements, equipment and stores for the operation of four air field strips, and
  - Thereafter, a phased program designed progressively to establish air bases in France.
84. The Navy was required to conduct the shipping program to meet those requirements. Formations were to be landed, on the second, third and possibly fourth tides, from landing ships and landing craft of the Naval Follow-up Force. The first British and the first United States Build-up divisions were to be preloaded into ships and to sail complete from the THAMES and the BRISTOL CHANNEL. On D plus 1, the landing of Build-up personnel, vehicles and stores was also to start from other types of shipping. The sailing of all ships and craft during the Build-up was arranged so as:
- To land the maximum possible force that could be effective by D plus 3; and
  - To produce thereafter a regular daily lift for personnel, vehicles, and stores and thus to avoid a succession of loading and discharging peaks.

## **PART 4 COMPOSITION AND ORGANIZATION OF FORCES**

### **A. Army Forces, Allied Expeditionary Force**

82. The land forces which were operationally available<sup>1</sup> on 31st of May, to participate in the NEPTUNE Operation were:

36 Divisions	(17 British - 19 U.S.)
10 Armoured and Tank Brigades	(British)
5 Armoured Groups	(U.S.)
1 Independent Inf. Brigade	(British)
10 Ranger & Commando Battalions	(8 British Commandos - 2 U.S. Ranger Battalions)
4 Separate Parachute Regiments	(U.S.)
1 L of C division	(British)

--This total was made up as follows:

Units	U.S.		British	
	Present in U.K.	Operationally available	In U.K.	Operationally available
Infantry Divs.	13	12	10	10
Amoured Divs.	6	5	5	5
Airborne Divs.	2	2 (-)	2	2
L of C Divs.			1	1
Separate Parachute Regiments	4	4		

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Tank and Armoured Brigades			10	10
Armoured Group Composite	4	4		
Armoured Group Light	1	1		
Commandos			8	8
Ranger Battalions	2	2		
Independent Infantry Brigade			1	1

## B. Air Forces, Allied Expeditionary Force

83. The air forces available in the United Kingdom for operations in support of NEPTUNE were as follows:<sup>1</sup>

Type of Squadron	Aircraft per sqdn.	Number of Sqdns. Available in U.K. 1st June 1944.
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### U.S. Eighth Air Force

Bomber heavy day	12	165
Fighter day	25	45
Photo recce	12	4

### U.S. Ninth Air Force

Bomber medium	16	32
Bomber light	16	12
Fighter day	25	63
Fighter night	12	3
Fighter recce	18	4
Photo recce	12	4
Troop carrier	13	52

### Royal Air Force

Fighter day	18	59
Fighter bomber	18	18
Fighter recce	18	8
Fighter night	18	22
Bomber light		
(a) Bomber Command	20	6
(b) TAF	18	12

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Photo Recce	18	8
Bomber heavy night	20	72½
38 Group (Troop Carrier)	46	10
Transport Command	30	5

84. Available air lift for NEPTUNE airborne forces was as follows:<sup>1</sup>

	Power Planes	Initial lift	Reserve	Gliders	Glider Pilots
<b>BRITISH</b>					
<b>R.A.F. Transport Command</b>					
5 Squadrons Dakotas	150	135	15		
<b>R.A.F. 38 GROUP</b>					
4 Squadrons Albermarles	104	88	16		
4 Squadrons Sterlings	104	88	16		
2 Squadrons Halifax	40	36	4		
Horsa and Hamilcar Glider Pilots				900	1230
<b>UNITED STATES</b>					
<b>IX TROOP CARRIER COMMAND</b>					
13½ Groups Dakotas	986	810	176		
GCG - 4A and Horsa Gliders and Pilots				2400	1352
<b>TOTALS</b>					
	1384	1157	227	3300	2582

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### C. Naval Forces, Allied Expeditionary Force:

85. The seaborne "lift" available was sufficient to produce a "lift" for five divisions to assault on an eight-R.C.T. front, for a follow-up of two divisions, and for pre-loaded build up of two more divisions, with overheads and stores for forces already ashore. In addition adequate resources were available for covering forces, minesweeping, and all miscellaneous tasks required of the Navy.

86. Naval and Merchant Shipping forces taking part in NEPTUNE were as follows:

(a) <b>Heavy Units</b>	139
7 Battleships	
25 Cruisers	
105 Destroyers (79 Fleets, 26 Hunts)	

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2 Monitors			
2 Gunboats			
(b) <b>ESCORT VESSELS</b>	142		
26 Escort Destroyers			
27 Frigates			
71 Corvettes			
18 P.C.			
(c) <b>COASTAL FORCES</b>	316		
145 M.L.s			
54 H.D.M.L.s			
82 Large M.T.B.s			
84 Small M.T.B.s			
6 S.G.B.			
32 R.M.L.s			
18 S.C.			
15 P.T.			
60 Coastguard Cutters			
(d) <b>MINESWEEPERS</b>	277		
12 F.M.S. Flots.			
98 - 35 Attached Danlayers			
4 B.Y.M.S. Flots. 40			
7 M.M.S. Flots. 70			
16 L.L. Trawlers			
18 Y.M.S.			
(e) <b>TUGS</b>	25		
125 British			
91 American			
9 Rescue			
(f) <b>WARSHIP BLOCKSHIPS</b>	4		
2 Very Old Battleships			
2 Very Old Cruisers			
(g) <b>MISCELLANEOUS</b>	9		
39 Salvage and Wreck Disposal Ships	9		
60 Smoke making Trawlers			
	<b>1202 (Total)</b>		
(h) <b>LANDING SHIPS AND CRAFT</b>			<b>4021</b>
		<b>British</b>	<b>U.S.</b>
		<b>Manned</b>	<b>Manned</b>
			<b>Total</b>
Landing Ships (L.S.I., AP.A. and L.S.T.)	126	185	311
Major Landing Craft Including Support Craft	777	434	1211
Minor Landing Craft and Barges	1570	929	2499
(i) <b>MERCHANT SHIPS (INCLUDING TUGS)</b>	<b>1256</b>		
18 Personnel Ships (not including LSI)			

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224 M.T. Ships	
64 M.T. Coasters	
122 Store Coasters	
150 Tankers & Colliers	
136 Cased Petrol Carriers	
55 Blockships	
76 Ammunition Carriers	
18 Ammunition Supply Issuing Ships (ASIS)	
78 Liberty Store Ships	
10 Hospital Ships and Carriers	
10 Accommodation Ships	
295 Miscellaneous	
1256 (total)	
TOTAL MERCHANT SHIPS	1373
TOTAL LANDING SHIPS & CRAFT	4021
TOTAL NAVAL FORCES	1089
(total)	6483

86. **The PERCENTAGE OF AMERICAN AND BRITISH (INCLUDING ALLIED) SHIPS<sup>1</sup>** in these totals is indicated below: -

TYPE OF SHIP	TOTAL NO.	AMERICAN	BRITISH	INCLUDED IN BRITISH %
BATTLESHIPS	6	50%	50%	Not including NELSON
CRUISERS	23	15%	85%	1 Polish 2 French
DESTROYERS	104	35%	65%	4 Canadian, 2 Allied
LANDING SHIPS & CRAFT	4021	40%	60%	Including Allied manned craft.
COASTAL FORCES	316	30%	70%	" "
MINESWEEPERS	277	10%	90%	" "
ESCORT VESSELS	152	15%	85%	28 Canadian, 8 Allied
MONITORS & GUNBOATS	4	0%	100%	2 Dutch Gunboats
ANCILLARY FORCES (Tugs, salvage vessels,	324	30%	70%	Including Allied manned craft

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

etc)

MERCHANT SHIPS M.T. Ships)	224	50%	50%	" "
COASTERS, etc. (Blockships included)	1032	2%	98%	" "
TOTAL % OF ALL VESSELS	6483	30%	70%	

[Pages 294-300 missing from original manuscript.]  
--300--

## PART 5 THE NAVAL PLAN

### A. Outline Review Of NEPTUNE Operation

87. The outline of the naval aspects of NEPTUNE operation can be summarized under the following headings:

- a. **Object:** The object of NEPTUNE was to carry out an operation from the United Kingdom to secure a lodgement on the Continent, from which further offensive operations could be developed. The lodgement area, which was required to contain sufficient port facilities to maintain a force of 26 to 30 divisions, and to enable it to be augmented by re-inforcements at the rate of 3 to 5 divisions per month, was to comprise the Cherbourg and Brittany Peninsula including all that part of France lying westward of a line drawn from Caen to Nantes.
- b. **Naval Objectives:** The naval objective was the safe and timely arrival of the Assault Forces at their beaches, the cover of their landings, and subsequently the support and maintenance, and the rapid build-up of allied forces ashore.
- c. **The Broad plan of attack:**
  1. To assault from landing ships and landing craft in the bay of the Seine between Ouistreham and Varreville, with 5 divisions attacking on an R.C.T. front, and also to attack shortly before H-hour on the flanks behind the assault beaches by airborne landings.
  2. To complete the landing of the first 7 seaborne divisions on the second tide of D-day and the first tide of D plus 1 day. Thereafter to build-up the forces at the average rate of one and one third divisions a day.
  3. Initial army objectives were the towns of Caen, Bayeux, Isigny, Carentan, the airfields in the area, and immediately afterwards, the port of Cherbourg.
  4. Subsequently, the advance was to be made to the West and Southwest in order to capture the Brittany ports to and including NANTES by D plus 30 to D plus 40.
  5. The next main objective was to be to capture Paris and to clear the enemy from the whole of Southern France.
- d. **Command:** The operation was to be a combined British and United States undertaking, by all services of both nations operating under the command of the Supreme Commander, Allied Expeditionary Force, (SCAEF), General D. D. Eisenhower. Under him and exercising joint command were three service Commanders-in-Chief,
  1. Navy, Admiral Sir Bertram Ramsay (ANCF)
  2. Army, General Sir Bernard Montgomery, (as Commander 21st Army Group), and
  3. Air Forces, Air Chief Marshal Sir Trafford Leigh-Mallory (Air C-in-C, AEF)

The attack was to be launched by a Western (U.S.) and Eastern (British) Task Force in adjacent sectors in the Bay of the Seine. Command of these task forces and of all

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subordinate formations was to be exercised in accordance with the principle of Unity of Command, which provided that, until the Army was firmly established ashore, command of army formations embarked was to be exercised by the appropriate naval commander.

- e. **Forces Taking Part:** The Western Naval Task Force under Rear Admiral A. G. Kirk, U.S.N., with elements of the 1st U.S. Army under Lt. General O.N. Bradley, U.S.A., was to attack the western beaches of the Seine Bay as follows: Assault Force U, with the 4th division of the VIIth Corps, was to assault UTAH beach at Varreville.

- 4 Assault Force O, with two R.C.T. of the 1st and two R.C.T of the 29th divisions of the Vth Corps, was to attack OMAHA beach at St. Laurent.

- 5. Follow-up Force B, with 1 R.C.T of the 1st and 1 R.C.T of the 29th division and overheads, was to arrive in the OMAHA area on the second tide of D-day.

The Eastern Naval Task Force under Rear Admiral Sir Philip Vian, R.N., with elements of the 2nd British Army (under Lt. General Sir Miles Dempsey), was to attack the eastern beaches of the Seine Bay as follows:

- 6. Assault Force G, with the 50th division of the XXXth Corps, was to assault GOLD beach at Asnelles.

- 7. Assault Force J, with the 3rd Canadian Division of 1st Corps, was to assault JUNO beach at Courseulles.

- 8. Assault Force S, with the 3rd Division of the 1st Corps, was to assault SWORD beach at Ouistreham.

- 9. Follow-up Force L, with the 22nd Armoured Brigade of the 30th Corps, was to arrive in the British area on the second tide of D-day.

- 10. In addition, seven Commando battalions of Force J and two Ranger battalions of Force O were also to assault selected points along the beaches.

- g. **D-day H-hour:** H-hour was to be 40 to 138 minutes after morning civil twilight and 3 to 4 hours before high tide. D-day was to be the first date in June of suitable weather when an appropriate H-hour occurred (viz June 5, 6 or 7 and June 18, 19 or 20). D-day was subject to postponement from day to day, up to two days, in each suitable tidal and lunar period. A decision would be made about the operation owing to weather. Should postponement until the next suitable lunar period (i.e. about 12 days) be essential, troops, but not vehicles, would be disembarked.

- h. **Program:** The Assault, Follow-up and First Build-up Forces were to be preloaded and assembled on the South Coast of England between the Thames and the Bristol Channel. They were to proceed in escorted convoys along pre-arranged swept channels protected by air and naval covering forces. Airborne Landings were to take place shortly before H-hour behind the assault beaches on the flanks, an American Division landing in the South East of the COTENTIN Peninsula, near CARENTAN, and two British Brigades at CAEN and the River ORNE crossings.

88. The sea borne assaults were to be made approximately simultaneously at H-hour, i.e. between 0600 and 0830, depending on the day selected as D-day. Follow-up forces were to arrive p.m. D-day. The first two build-up divisions, one U.S. preloaded in the Bristol Channel, and one British preloaded in the Thames, were to be sailed to arrive, half on D plus 1 and half on D plus 2. Thereafter the Build-up was to be maintained by daily sailings of Personnel and M.T. Ships and Coaster Convoys, and by a Shuttle Service of L.S.T., L.C.I. (L), and L.C.T., from ports on the South Coast, the Bristol Channel and the Thames. The Build-up was to delivery approximately one and one third divisions per day complete with equipment. In addition each division already ashore was to be supported by the delivery of stores at the rate of 600 tons per day per division. The assault was to be supported by a bombardment force of 7 Battleships, 2 Monitors, 23 Cruisers, 2 Gunboats, 75 Fleet Destroyers, 16 Hunt class destroyers and special bombarding craft. The majority of the destroyers were also to escort assault convoys. In addition, 165 Sloops, Escort Destroyers, Frigates, Corvettes, and P.C's were allocated to the Assault Forces and early convoys as escorts. The approach was to be covered by 20 Destroyers and 60 Coastal Craft. Four A/S Support Groups were to operate in the approaches to the Channel. Distant cover was to be provided by the R.N. Home Fleet and special forces of C-in-C Western Approaches.

89. Two prefabricated harbors (MULBERRY A and B) were to be constructed, one in the U.S. and one in the British Sector. They would enable stores to be unloaded when the weather prevented discharge over open beaches. It was hoped to complete their construction by about D plus 18. Five craft shelters (GOOSEBERRIES) were to be formed by the sinking of 60 old ships, which would arrive on D plus 1 and D plus 2. These shelters were expected to form a lee for the Ferry Craft.<sup>1</sup>

## B. Loading and Assembly<sup>1</sup>

97. NEPTUNE Plans provided for the loading and assembly of the forces, as indicated below:

1. **The assault and follow-up forces** and the first build-up divisions were to load and assemble as follows:-

Force	Military	Loading Point	Assembly Point
First Br.	Build-up Div.	Thames	Thames
L	1 Brigade 2 Brigade	Tilbury Felixtowe	Southend Harwich
S	1 Brigade 2 Brigades	Portsmouth Newhaven Shoreham	Newhaven and Shoreham and Portsmouth
J	(3 Brigade (Commandos	Southampton Portsmouth	Southampton & Solent Portsmouth
G	3 Brigades	Southampton	Southampton & Solent Spithead
O	(4 R.C.T. (Rangers	Portland and Weymouth	Portland & Weymouth and Poole
U	3 R.C.T.	Torquay, Brixham Dartmouth and Plymouth	Torbay, Brixham Dartmouth and Salcombe
B	2 R.C.T.	Plymouth Falmouth and Fowey	Plymouth & Falmouth & Fowey
First U.S.	Build-up Division	Bristol Channel Ports	Bristol Channel Ports

2. **Attached Forces** were to be assembled as follows:-<sup>1</sup>

FORCE	ASSEMBLY PORTS
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Naval Covering Forces of Destroyer	Plymouth and Portsmouth
Naval Covering Forces of Coastal For.	Dartmouth; Portland; Newhaven; Dover
Landing Craft of the Ferry Service	Chichester; Langstone Harbor; Poole
Tugs; Salvage Vessels; Accommodation Ships; Maintenance Vessels	Ports between Falmouth and Southend
Escorts and Minesweepers	With their convoys
Eastern Task Force Bombarding Ships	Clyde
Western Task Force Bombarding Ships	Belfast
Blockships (CORNCOBS)	Oban
MULBERRY Units:-	
PHOENIX	Selsey; Dungeness and a reserve in the Thames
BOMBARDON	Portland
WHALE	Solent and Selsey
Tugs	Portland and Spithead

3. **Merchant Vessels** were to be preloaded and assembled as follows:<sup>1</sup>

Type	Loading Points	Assembly Point
Stores Coasters	89 Thames	68 Thames
	12 Grimsby	55 Solent
	104 Bristol Channel	82 Bristol Channel

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M.T. Ships	37 London & Tilbury	London and Southend
	37 Bristol Channel	Bristol Channel
Personnel Ships	6 Tilbury	Tilbury
	9 Bristol Channel	Bristol Channel

4. In addition, empty M.T. Ships were to assemble at Southend and Bristol Channel awaiting loading berths; 34 of these ships would arrive in the Solent on D-day.

### C. Program of Assault and Follow-Up Forces

90. The Program of Assault and Follow-Up Forces, as laid down in the NEPTUNE Plan, were as follows:-

1. **The Approach:** The five Assault Forces were to sail from their assembly ports on D minus 1, with the exception of Force U, which was to sail from Devon and Cornwall ports in the evening of D minus 2. Each British Assault Force would be divided into some 16 groups, in conformity with the order they were required in the assault area; U.S. Forces were each to comprise about four Groups, depending on the speed of convoy and the tide on which they were required to land. Groups of Forces O, G and J were to proceed to point Z (15 miles South of the Nab Tower) and thence to latitude 50°05' North. Forces U and S were to proceed toward Area Z turning southward to 50°05' shortly before reaching it. From 50°05' Forces were to be swept through the mine barrier and to the transport areas by 10 Flotillas of minesweepers.
2. **Assault Timetable:** H-10 hours. The leading minesweepers were to cross the latitude of 50°05' North and precede each Assault Force across the suspected enemy minefield to the transport areas which were 7 - 11 miles from the beaches. Ten channels would be swept and danned, two being allocated to each assault force.

<b>Hours</b>	
H-6 to H-4	Minesweepers to pass the transport areas
H-4 <sup>1</sup> / <sub>2</sub>	U.S. Landing and Bombarding Ships to reach transport areas
H-3 <sup>1</sup> / <sub>2</sub>	U.S. L.C.T. to arrive as transport areas
H-2	First British L.C.T. to arrive at lowering positions (transport area)
H-2	U.S. L.C.A. (Wave 1) to depart from transport area
<b>Minutes</b>	
H-103 H- 78 minutes	U.S. Waves 2 to 5 to depart from transport area.
H - 100	British Landing Ships to reach lowering positions
H - 45	D.D. Tanks leave departure line (4000 yards from beach)

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

H - 30 to H	Bombardment by warships, and gunfire support craft to begin <sup>1</sup>
H - 5	D.D. Tanks to beach
H - H plus 50	L.C.V.P. and L.C.A. carrying infantry and obstacle clearing parties to beach. (preceded by L.C.A. (H.R))
H plus 45	First L.C.I. (L) to beach
H plus 60	First L.C.T. (Vehicles and Self-propelled artillery) land
H plus 60 to H plus 3 1/2 hours	L.C.T. and L.C.I. (L) beach.

3. **Commandos and Rangers:** Commandos and Rangers were to sail with the assault forces; their landings were to take place simultaneously with the Assault as follows:
  1. Five Commandos on the Eastern Flank to capture Ouistreham and to destroy crossings of the River Orne.
  2. One Commando west of Force J to mop up
  3. One Commando west of Force G to capture Port En Bassin.
  4. Two Ranger Battalions to secure Western Flank of OMAHA assault area, and capture the Isles de Margouf.
  5. Two Commandos were to stand by to destroy coastal batteries on the Eastern Flank on the night of D to D plus 1 if required.
4. **L.S.T:** U.S. and British L.S.T.s were to arrive at the transport area at H - 2 and H plus 4 respectively. They were to tow Rhino ferries which were to be used to discharge their vehicles. A proportion of the assault force L.S.T.s were to arrive on the second tide of D-Day. L.S.T.s were to beach only if the gradient proved favorable.<sup>1</sup>
5. **Follow-up Forces:**<sup>2</sup> Forces L (British) and B (U.S.) were to sail from the Thames and Bristol Channel to arrive in time to unload on the second tide of D-Day. As discharge could not be completed on D-Day, a proportion of L.S.T. were to arrive with build-up convoys and to discharge on the third tide. Follow-up Forces comprised L.S.T., L.C.I. (L) and L.C.T., Force L was to be divided into five groups and Force B into three groups; the latter was to bring two causeways which were to form sunken roadways on the beaches to facilitate unloading. Twenty-four stores coasters were to arrive with follow-up Forces.
6. **Subsequent Movements of Assault Ships and Craft:**<sup>3</sup>
  - a. L.S.I. were to return to U.K. in convoy as soon as they had been discharged and their L.C.A. and L.C.V.P. had been hoisted.
  - b. L.C.I.(L), except those required to discharge personnel build-up ships, were to return to the U.K. to form part of the Shuttle Service.
  - c. L.C.T. (3 and 4) were to return to the U.K. in groups to form the Shuttle Service.
  - d. L.C.T. (5 and 6) and L.C.I. (S) were to remain in the assault area to form the Ferry Service.
  - e. Major Support Craft were to replenish with ammunition in the assault area if required for further bombardment.
  - f. Minesweepers were to sweep the assault area and widen the approach channels.
  - g. Escorts were to be allocated to returning convoys.

#### **D. The Build-Up<sup>1</sup> for Offensive Land Operations**

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

91. The landing of Allied Forces in France, subsequent to those carried in the Assault and Follow-up, was styled the Build-up. The whole build-up convoy programme was one of extreme complexity from the Naval point of view, it necessitated the most careful timing in order to maintain the tempo of landing of allied forces and their stores. The build-up plan was designed:
- a. To lift the maximum force in preloaded ships and craft by D plus 3;
  - b. To produce thereafter a regular lift of approximately 1.1/3 divisions per day in daily convoys and the shuttle service, thus avoiding a succession of loading and discharging peaks; and
  - c. To delivery maintainance cargos at the rate of 600 tons per day per division.
92. The Build-Up was to be carried in: (1) a MERCHANT service, (2) a SHUTTLE service, and (3) a FERRY service:
1. The **MERCHANT** service, was to be composed of some 1,256 vessels including M.T. ships and Coasters, Stores Coasters and ships, tankers, colliers, Libertys, Tugs and so on. The Merchant Service included:
    - (a) Personnel Sailing from PLYMOUTH, PORTLAND, SHIPS (L.S.I.s) SOUTHAMPTON, and NEWHAVEN.
    - (b) M. T. Ships Sailing from FALMOUTH, PLYMOUTH, SOUTHAMPTON, and the THAMES.
    - (c) M. T. Coasters Sailing from BRISTOL CHANNEL, FOWEY, PLYMOUTH, SOUTHAMPTON, POOLE, NEWHAVEN, THAMES and HUMBER.
  2. The **SHUTTLE** Service was to be composed of L.S.T.s, L.C.T.(3)s and (4)s, and L.C.I.(L)s sailing from PORTLAND, NEWHAVEN, and the ISLE OF WIGHT (convoy code words BLUESKY southbound, and STARLIGHT northbound) L.S.T.s working from THAMES were to join M.T. convoys.
  3. The **FERRY** Service was to provide lighterage for unloading ships lying off the beaches. It was to consist of approximately 1,557 Landing Craft, Landing Barges, and Rhino ferries. A large number of D.U.K.W.'s were also to be employed. When tidal and beach conditions permitted L.S.T.'s were to discharge direct to shore.
93. Ports to the east of Southampton were to be used in the build-up for British troops and equipment, while ports to the west were reserved for American troops and equipment. Southampton was to be joint British and U.S., and Poole was to be jointly used for stores. Convoys of M.T. ships and coasters were to be run daily, from ports in the East and ports in the West, to the Isle of Wight area to join convoys sailing from the Central Sector. Daily return convoys were to be run from France to the Central Sector (Isle of Wight area), and from there to ports on the wings with empty ships to be loaded in these sectors. The marching personnel of units loaded in M.T. ships in the Thames were to be carried in LCI(L) or personnel ships from Newhaven; those from units loaded at Plymouth and Falmouth were to be similarly carried from the East Devon ports and Weymouth. Otherwise, units were to sail together from the same hards or ports, even if carried in different convoys.
94. **B.U.C.O.** In order to control and coordinate the Build-up program, and to assure that special requirements or changes in the Army's plan could be met promptly, a body composed of representatives of the Joint Commanders-in-Chief, styled B.U.C.O. (Build-up Control Organization) was set up at the Combined Headquarters, Portsmouth. ANCXF in conjunction with the British Ministry of War Transport and the U.S. War Shipping Administration was responsible for implementing the movements of ships and craft on decisions reached by B.U.C.O. Under B.U.C.O., two control organizations MOVCO and TURCO were responsible for implementing the cross channel movement plan.
95. **T.U.R.C.O.** To assist naval shore authorities in the quick turn round of ships and craft, inter-service bodies styled **T.U.R.C.O.'s**(Turn Round Control Organization) were set up at the Nore, London, Portsmouth, Newhaven, Portland, Cardiff and Dartsmouth. T.U.R.C.O.'s duties were to collect all ships coming in to find out their state, to supply them with their main requirements, to load and to sail the ships and craft, in convoys or groups, to fulfil the Military Plan
96. **M.O.V.C.O.** To assist the rapid loading of vessels in accordance with authorized priorities, inter-service bodies called M.O.V.C.O.'s (Movement Control Organization) were set up at embarkation points. Their duties were to assemble the formations, equipment and cargo to be shipped at embarkation points and to direct embarkation so as to fulfill the Military Plan.

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

97. **N.O.I.C's** To control arrivals, discharge and departures of vessels on the far shore, naval authorities styled NOIC's (Naval Officers in charge) were to be established, at first in ships lying off the beaches and later on the beaches themselves.
98. **The Numbers of Ships and Craft in the Build-up** arriving in France up till D plus 3 and the estimated sailings from D plus 3 onwards are shown in the following attached tables.

## E. Supporting Naval Operations

99. (1) **Minesweeping**<sup>1</sup> Minesweeping Operations were divided:
1. To provide a safe passage for the assault forces to the transport area, then
  2. To provide wider channels from 50° N to the beaches for shipping in the build-up, and
  3. To sweep a channel, parallel to the beaches, which would be broadened until it would form a safe anchorage and patrol area.

### FORCES AVAILABLE

12 Fleet Minesweeping Flotillas  
 7 Motor Minesweeping Flotillas  
 4 B.Y.M.S. Flotillas  
 2 Y.M.S. Flotillas  
 4 Groups of LL Trawlers

3 or 4 dan layers and 2 M.L.'s were to be attached to each F.M.S. Flotilla.

100. 10. F.M.S. Flotillas were to sweep 10 approach channels for the assault forces from 50° N to the lowering positions and mark them with dan buoys. During the approach, contact with enemy patrols could be expected but as the following forces would be committed to a narrow passage through heavily mined waters, it was essential that flotillas maintain sweeping formation relying for protection on destroyers, which would be in the immediate vicinity.
101. During D-day and D plus 1 day, 4 channels about 2 miles wide were to be established by sweeping the water between pairs of approach channels. These channels were to be marked by ocean light-buoys.
102. Bombarding Forces operating on the flanks were each to be provided with a flotilla of Fleet Minesweepers which remained with the bombarding ships throughout the assault.
103. Permanent swept channels to W.T.F and E.T.F. areas, marked by ocean light buoys, were to be completed as soon as possible after D-day, the details being signalled by "Q" message.
104. After the fall of CHERBOURG channels were to be swept from Cherbourg to the NEEDLES, and to the northeastwards.
105. [No para. 113 in original.]
106. **(2) Bombardment**<sup>1</sup> The following ships were to form the bombarding forces:

6 Battleships (plus 1 reserve) 75 Fleet Destroyers  
 2 Monitors 16 Hunt Destroyers  
 23 Cruisers 2 Gunboats

107. Battleships and Cruisers were to assemble in the Clyde (Eastern Task Force) and Belfast (Western Task Force) and were then to proceed to the Assault Area independently with attached minesweeping Flotillas and a destroyer and frigate escort. The majority of destroyers were allocated as escorts to the Assault convoys during the approach.
108. Bombardment was to be carried out under the orders of the Assault Task Force Commanders, commencing about 40 minutes before H-hour, with the following objects:
- a. To neutralize coastal defence and inland batteries, especially those capable of bringing fire to bear on the approach channels and transport areas.
  - b. To destroy beach defences during the final approach and assault.
  - c. To support the Army after the assault by engaging hostile batteries, enemy formations, or defended areas.

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109. When no longer required for bombarding, destroyers were to be used by Task Force Commanders for the defence of the Assault Areas.
110. Bombarding ships were to return to Portsmouth, Plymouth, or Portland, to replenish ammunition; about two outfits per bombarding ship were to be held in immediate reserve. Spotting for indirect bombardment was to be carried out by:
- Single Seater Fighter Aircraft, of which 104 were available on D-day (see Air Section).
  - Forward Observers Bombardment (FOB), of whom 40 were to land with military formations to work with the Eastern Task Force.
  - Shore Fire Control Parties (SFCP's) of whom.... were to land with each U.S. Assault Battalion.
  - Air Observation Posts (Piper Cubs) which were to be employed in the later stages through FOB's and SFCP's.

Bombarding Ships were allocated as follows:-

<b>Assault Force</b>	<b>Bombardment Force</b>	<b>Ship</b>	
<b>Eastern Task Force</b>			
S.	D.	<i>Warspite</i> <i>Ramillies</i> <i>Mauritius (C.S.2.)</i> <i>Arethusia</i> 10 Fleets	<i>Frobisher</i> <i>Dragon</i> <i>Danae</i> <i>Roberts</i> 3 Hunts
J	E	<i>Belfast</i> 7 Fleets	<i>Diadem</i> 4 Hunts
G	K	<i>Orion</i> <i>Ajax</i> <i>D.S. Flores</i> 9 Fleets	<i>Argonaut</i> <i>Emerald</i>  4 Hunts
E.T.F. Reserve		<i>Rodney</i>	<i>Sirius</i>
<b>Western Task Force</b>			
O	C	<i>Texas (R.A.Bryant)</i> <i>Arkansas</i> <i>Glasgow</i> 9 U.S. Destroyers	<i>F.S. Montcalm (Flag)</i> <i>F.S. Georges</i> <i>Leygues</i>  3 Hunts
U	A	<i>Nevada</i> <i>Erebus</i> <i>Tuscaloosa (R.A.DEYO)</i> <i>Enterprise</i> 8 U.S. Destroyers	<i>Quincy</i> <i>Hawkins</i> <i>Black Prince</i> <i>D.S. Soemba</i>

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

W.T.F. Reserve		Augusta (NCWTF Flag) 5 U.S. Destroyers	Bellona
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Notes: (i) *Nelson* was detailed as spare battleship

(ii) *Sheffield* and *Sirius* were detailed as spare cruisers

(iii) A further 12 U.S. Destroyers were to be kept in reserve being employed in other duties meanwhile.

(3) **Diversions**<sup>1</sup> Three diversionary operations, supported by air sorties, were to be carried out by 32 H.D.M.L's and 6 Pinnaces, at the same time as the assaults. Troops were not landed. The threat was to be established by Radio Counter Measures, the use of smoke and sonic warfare.

111. The object was to contain enemy reserves and to draw off enemy naval forces from the assault convoys. The operations were:

Operations	Force	Location
GLIMMER	28 H.D.M.L.	Pas de Calais Area
TAXABLE	6 Pinnaces	Bruneval-Fecamp on a 14 mile front
BIGDRUM	4 H.D.M.L.	East of Barfleur

112. Operation BIGDRUM was intended to screen and divert the attention of enemy radar stations on the Cherbourg Peninsula from the approaching assault forces.

113. (4). **Covering Forces**<sup>2</sup> C-in-C Home Fleet, C-in-C Western Approaches and C-in-C Plymouth were to provide distant cover, outside the English Channel, under the general direction of the Admiralty.

114. Within the English Channel, cover against destroyers, small surface craft and U-boats was to be given by four divisions of fleet destroyers and by Coastal Forces (under the control of Commanders-in-Chief, Plymouth and Portsmouth and V.A. Dover), operating outside the Assault Area.

115. A further four U.S. Destroyers provided cover for the exposed flanks of Western Task Force convoy routes.

116. Four Anti-Submarine Support Groups, each consisting of five Destroyers or Frigates, were to operate within the Plymouth Command in support of NEPTUNE.

117. Air operations by Coastal Command, including a system of patrols of the Western Approaches and in the Channel known as the "CORK", are described in Chapter VII.

118. Destroyers and Coastal Forces were to be based and attached to Home Commands as follows:

Command	Base	Type	Number
Dover	Portsmouth	Destroyers	4
	Dover	Small M.T.B.	23

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

	Newhaven	Large M.T.B.	8
<b>Portsmouth</b>	Portsmouth	Destroyers	4
	Isle of Wight	Small M.T.B.	20
		Large M.T.B.	8
<b>Plymouth</b>	Plymouth	Destroyers	8
	Dartmouth	Small M.T.B.	20
		Large M.T.B.	8

**TOTALS: 16 Destroyers and 83 M.T.B.'s**

119. A maximum of 50 per cent of Coastal Forces was to be Operational each night.
120. (5) **Defence of the Assault Area**<sup>1</sup>
121. **Responsibilities:** (a) ANCXF was responsible for coordinating the defence of the assault area from attack.  
(b) Task Force Commanders were responsible for the defence of their own forces from Landward attack and attack by enemy craft which might penetrate the outer defence lines.
122. **Close Cover:** In the Channel, to guard the flanks of assault area, close cover was provided by 8 Fleet destroyers and 24 M.T.B.s from Portsmouth Command and by 4 Fleets and 39 M.T.B.s from the Dover Command.
123. **Continuous Air Cover** was to be maintained over the Assault area by day and night. Coastal Command was to maintain continuous patrols in the S.W. and Eastern approaches to the Channel to give early warning of, and protection from, enemy surface forces and U-boats.
124. Forces available for the defence of the Assault Area by Task Force Commanders were:
- Bombarding warships.
  - Escort vessels waiting for return convoys.
  - Minesweepers.
  - A/S Trawlers.
  - M.L.'s, H.D.M.L.'s., M.T.B.'s, L.C.G.'s, and L.C.F.'s.
  - Eagle ships for A.A. Defence.
  - Smoke making trawlers.
125. The Task Force areas were divided into sub-areas for defence purposes. The Inshore sub-areas were given lettered defence lines spaced half a mile apart running parallel to the coast. The orders and policies for the defence of the Task Force areas were given code letters. Each method of defence in each order was given a number. This scheme enabled Task Force Commanders to order quickly the appropriate defence measures for a particular set of circumstances.
- A Duty Destroyer Division and Guard Destroyers** were to be detailed in each Task Force area. They would be available for defence purposes by day, and patrol near the static defence lines by night.
126. The primary defence of the anchorages against surface attack at night was to be by static night defence lines of anchored or slowly patrolling minesweepers, LCG's, LCF's, and PC's. MTB's and PT's were to patrol on the east and west flanks of the assault area.

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

127. The main A/S defence was to be patrols of A/S trawlers and ML's round the anchorages. During the night the static defence lines would also give a measure of A/S protection.
128. In the event of attack by **Walter Boats**, a division of Coastal Forces was to be spread in the likely direction of approach and to listen with asdics. A second division was to be concentrated in pairs and to act as striking forces.
129. **If W-boats** were suspected in the anchorages, Task Force Commanders were to allocate forces to sweep across the suspected area dropping depth charges.

Operation ALERT (anti-human torpedo operation) was available to be brought into force.

130. **Air Defence:** Each force was detailed in "A.A. and Radar" guardship. Umbrella barrage was to be ordered by Force Commanders over shipping off the beaches if required.

**Smoke:** Assault Force Commanders were responsible for smoke defence in their own areas. Minesweepers and landing craft on the static defence lines were to assist in the smoke defence plan. Smoke from shore generators under Army Control were also available to be called for through N.O.I.C's ashore.

(6) **Minelaying:**<sup>1</sup> **The object** of the Minelaying Plan (Codeword MAPLE) was to assist in the protection of the bombarding and assault forces, against attack by E and R boats (particularly by those operating from LE HAVRE and CHERBOURG), and in the general protection of forces operation in the Channel.

**Forces Taking Part were:**

Fast minelayer <i>Apollo</i> 1 ML Flotilla	from PLYMOUTH
3 MTB Flotillas	from PORTSMOUTH
2 ML Flotillas small minelay <i>Plover</i>	from DOVER
2 MTB Flotillas 1 ML Flotilla	from NORE
Heavy Bombers from Bomber Command	

131. **Mines:** Special new types of ground and moored mines were to be laid, with a proportion of normal types to cloak the use of special types. The effective lives of mines was to be restricted to allow entry into CHERBOURG on D plus 3 and into LE HAVRE on D plus 14. Other minefields were to become safe at various dates after D-day. Minesweeping gear capable of dealing with the special mines was available in case it should become required necessary to remove allied minefields.
132. **Minelaying Operations** were divided into six phases: Phase I and II. Routine laying of standard mines in standard areas till D-24.

Phase III (D-24 to D-3). Laying of special mines by minelayers and aircraft in the Channel and the North Sea. Special type mines were also to be laid by aircraft in the standard areas in Baltic, Kattegat, Heligoland Bight, Frisian Islands and Biscay ports after D-10.



Phase IV (D-2 to D-1). Laying of special type mines only in the approaches to Le Havre, Cherbourg, Calais and Boulogne and by aircraft off Ijmuiden, Hook, West Scheldt, Chenal Du Four and Brest.

Phase V (D-1 to D-day). Laying special type mines only by coastal forces off Le Havre, Cherbourg, Etretat and Brittany Coast.

Phase VI. After D-day, as required.

## F. Supporting Air Operations

133. (1) **Command:**<sup>1</sup> The Air C-in-C A.E.A.F. coordinated all air operations from his H.Q. at Stanmore. The Commander Advance A.E.A.F. exercised tactical control of the 2nd Tactical Air Force (Br) and 9th Army Air Force (U.S.) from UXBRIDGE.

(2) **Forces Available:**

		<b>Squadrons Aircraft</b>	
8th & 9th Army Air Forces (American)	Day Bomber Heavy	165	1,320
	Day Fighter	108	1,728
	Bomber Medium	32	283
	Bomber Light	12	144
	Night Fighter	3	36
R.A.F.	Night Bomber Heavy	72½	870
	Bomber Light	18	216
	Day Fighter	59	708
	Fighter Bomber	18	216
	Night Fighter	22	264
Coastal Command	Anti-U Boat	21	252
	Anti-Shipping	10	120
	G.R. Fighters	3	36
	Night Recce	1	12
	Air Sea Rescue	2	24
F.A.A. (under Coastal Command)			
Air Spotting	Fighters	9	104
<b>TOTAL</b>		<b>561½</b>	<b>6,518</b>

The above figures do not include aircraft of Troop Carrier and Transport Commands, or photographic and Fighter Reconnaissance aircraft.

The figures above include aircraft required for normal operations, such as the Air Defense of Great Britain.

(3) **Fighter Protection:** Normal fighter protection was to be given to all convoys. In addition, 5 squadrons were to patrol over the cross-channel routes at all times on D-day, and the same number were to be available as required thereafter.

134. A patrol of ten squadrons was to be maintained over the beaches and assault area.

135. Three Fighter Direction Tenders (converted L.S.T.'s) were to control patrols over the cross-channel route and assault area.

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

(4) **Coastal Air Operations:** Patrols in S.W. and Eastern approaches to the English Channel were designed to give early warning of, and protection from, enemy surface force, U boats or W boat attack; air striking forces being employed to destroy any such forces located.

136. Anti-U boat patrols were to be carried out by 21 squadrons from 19 and 16 groups composed of Sunderlands, Halifax, Liberators and Wellingtons, and by the U.S. Navy Fleet Air Wing Seven. The anti-shipping strikes were to be carried on by 10 squadrons of Beaufighters, Swordfish and Albacores.

137. These Patrols were to provide a cover of 30 minutes density in the Area, from the Western limits of the St. Georges and Bristol Channels into the English Channel, up to a line between Lyme Bay and Alderney. This area, known as the "**CORK**", was considered wide enough to prevent U boats, which passed through it submerged, from retaining enough battery power to be able to continue operating submerged, after traversing the CORK.

138. 3 Squadrons of Beaufighters and Mosquitos were to carry out reconnaissance and protection of anti-submarine patrols. One squadron of Wellingtons was detailed for night reconnaissance in conjunction with Coastal Striking Forces.

139. Squadrons of R.N. Fleet Air Arm Avengers and Swordfish were to provide close cover for the coastal convoys between Lynmouth and Portland and between the Nore and Beachy Head.

(5) **Smoke Laying:** Two squadrons of Bostons were available to screen the flanks of the assault area.

(6) **Minelaying by Aircraft:** Aircraft of Bomber Command were to carry out routine offensive laying until D minus 10 and were to lay special type mines off Ijmuiden, Hook, West Scheldt, Chenal de Four and Brest.

(7) **Air Spotting:** 16 Spitfires from No. 26 Squadron R.A.F. and 40 Seafires from No. 3 Naval Fighter Wing, operating from LEE ON SOLENT, were to spot for bombarding warships. Aircraft would operate in pairs, one spotting and one escort; their duties interchangeable.

140. In addition 3 Squadrons of Mustangs were to be available to carry out a minimum of 80 sorties up till 1200 D-day, after which they would return to their normal reconnaissance duties.

(8) **Air Bombardment:** Heavy air bombardment of enemy coastal batteries, beach areas and defences were to be carried out shortly before the assault.

(9) **Expected Scale of German Air Effort:** The total German Air Force strength, on the Western Front on D-day, was estimated at about 1,515 aircraft, disposed in France, Belgium, Holland, N.W. German, with a small number in Norway and Denmark.

141. From these 1,515 aircraft, the close support force available in the NEPTUNE area was estimated at 590 consisting of:

Long Range Fighter Bombers	Bombers	Single Engine Fighters	Twin Engine Fighters	Tactical Recce.	TOTAL
320	65	120	25	10	590

142. **G. Ancillary Operations**

143. (1) **MULBERRIES - Description:**<sup>1</sup> MULBERRY was an artificial harbor, erected primarily for landing stores off the beaches, in order to make the build-up independent of the weather.

MULBERRY A - American - at St. Laurant:

MULBERRY B - British - at Arromanches:

Both were planned to be completed by D plus 18.

142. The breakwaters, which would enclose an area about 2 miles long by one mile wide, were to be composed of the following units:
- a. Blockships (CORNCOBS) - sunk in water up to 2<sup>1</sup>/<sub>2</sub> fathoms.
  - b. Concrete Casisson (PHOENIX) - sunk in water up to 5 fathoms. These were 200' long, 60' high and vary in size from 2,000 to 6,000 tons.
  - c. Floating Booms (BOMBARDON) - moored in water up to 10 fathoms. These were 200 ft. long cricform floating steel structures which are moored end-on in a line forming an outer deep water anchorage outside the PHOENIX breakwater.
143. In the shelter of the breakwater, stores piers for unloading coasters and M.T. Piers for L.S.T. and L.C.T. were to be erected. The pier equipment, known collectively as WHALE, consisted of pierheads secured to the bottom by four vertical posts. The pierheads were connected to the shore by roadways supported by floating pontoons.

**Layout:** The layout of the breakwaters consisted of:

- a. A shallow water area of about 12 blockships which would be placed by D plus 3 to give half a mile of sheltered beach to landing craft. (GOOSEBERRIES II and III).
- b. An area sited on the 5<sup>1</sup>/<sub>2</sub> fathom line, in continuation of the GOOSEBERRY, composed of 40 PHOENIX to give shelter to 17 coasters at anchor or alongside piers.
- c. A line of about 25 Bombardons to seaward to give shelter to eight big ships (25 feet draught).
- d. The WHALE piers would lie inside the breakwater and would use the rocky foreshore on which landing craft cannot beach.

**Towage:** Towage was to commence on D-day from Selsey, the Solent, Dungeness, and Portland. Tows were not to cross latitude 50° North before noon on D plus 1. A special channel through the minefield was reserved for their passage. A regular flow were to arrive daily from D plus 2 to D plus 17.

144. 160 Tugs were allocated for this service.

**Erection:** MULBERRIES A and B were to be composed of the same types of units, differing slightly in layout.

145. The number required was:

	<b>MULBERRY A</b>	<b>MULBERRY B</b>	<b>Total</b>
PHOENIX	39	45	84
WHALE Pierheads	6	9	15
Roadways and Misc. WHALE Tows	41	58	99
BOMBARDON	24	24	48
		<b>TOTAL</b>	<b>246</b>

146. MULBERRY A was to include 6 Pierheads and three Roadways for both stores and L.S.T.

147. MULBERRY B was to include 3 Roadways from 7 Pierheads for stores and 1 Roadway from 2 Pierheads for L.S.T. and L.C.T.

148. **Daily Capacity**

a. **MULBERRY A (U.S.)**

D Plus 6 onwards	Vehicles	1400 vehicles to be landed daily dryshod
	Stores	1000 tons daily over the beaches.
D Plus 18 onwards		The port was to handle a daily minimum of 5600 tons.

b. **MULBERRY B (British)**

Day	Stores		Vehicles over Piers
	Daily Average	Maximum	
D plus 4 to D plus 8	1000 tons	1240 tons	-
D plus 9 to D plus 12	3400 tons	4150 tons	1250 (from D plus 11)
D plus 14 onwards	6000 tons	7340 tons	1260

**Summary**

This project consisted of some 400 units, aggregating a million and a half tons, averaging 35 heavy cross channel tows per day. It required the services of 160 tugs and involved 10,000 officers and men.

(2) **GOOSEBERRIES<sup>1</sup> - Description:** The GOOSEBERRIES were shelters, provided by sinking a line of about 12 blockships in 2½ fathoms. They were to serve two purposes:

- c. To provide a sheltered beach for landing craft to use in the event of strong on-shore winds.
  - d. To provide a refuge for ferry service and other small craft in rough weather.
- There were to be five GOOSEBERRIES:

- No. 1 at Varreville U.S.
- No. 2 at St. Laurent U.S. (Part of MULBERRY A)
- No. 3 at Arromanches British (Part of MULBERRY B)
- No. 4 at Courseulles British
- No. 5 at Oistreham British

e. They were to be formed by about 60 blockships (approximately 12 in each GOOSEBERRY) which were all Merchant Vessels except H.M.S. *Centurion*, D.S. *Sumatra*, H.M.S. *Durban* and F.S. *Courbet*: The last named was to be towed across the Channel.

f. The sinking of blockships was to commence p.m. D plus 1 and the GOOSEBERRIES were to be completed by D plus 3.

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

(3) **PLUTO, TOMBOLA, AND AMATHEA**<sup>1</sup>

**PLUTO** was an operation that was to provide facilities for the supply of gasoline to the Expeditionary Force on the far shores. This was to be done in two ways:

- a. By laying 10 pipes along the sea bottom (HAMEL or HAIS) from Sandown Bay to Querqueville. The pipelines were to be completed by D plus 75 and were expected to provide 2,500 tons daily.
- b. By laying 4 short pipelines (TOMBOLA or AMATHEA) off PORT EN BESSIN for tankers to discharge direct to shore storage tanks from off-shore moorings. The four TOMBOLA pipelines to be completed by D plus 18, would enable a large tanker to discharge 600 tons per hours.

PLUTO Force consisted of:

2 Cable Laying Vessels                      Capacity 100 miles of HAIS  
1 Cable Laying Vessels                      Capacity 30 miles of HAIS  
1 Cable Laying Vessels                      Capacity 18 miles of HAIS  
1 Cable Laying Vessels                      Capacity 26 miles of HAIS  
6 Conum Drums<sup>2</sup>                              Capacity 70 miles of HAIS  
3 Ocean Tugs for towing Conum Drums  
5 Cable barges (completing shore ends) capacity 1½ miles of HAIS  
3 Trawlers for hauling out TOMBOLA lines  
15 Accommodation barges, M.F.V.'s Motor Boats and harbor launches.

(4) **Buoy Laying**<sup>3</sup> Commencing on D-day, ocean light buoys marking the permanent swept channels were to be laid by 5 Trinity House Tenders working from the SOLENT area.

(5) **Surveying**<sup>1</sup> Two Surveying ships and L.C.F. (Sy) were to operate with the Trinity House Vessels and also with the assault forces, assisting in channel buoyage, Minor Port Surveys, locating and marking wrecks, beach surveys, planting GOOSEBERRIES and laying coast hauling off buoys.

(6) **Moorings**<sup>2</sup> Two net layers were to lay JANTZEN moorings, commencing at the first high water on D plus 1. These were a stern buoy and mooring used for hauling off Rhino Ferries and Coasters which beach, and for preventing them from breaking.

(7) **Salvage - British**<sup>3</sup> There were 10 groups of Salvage and Wreck Disposal Vessels, each group consisting of three vessels. Six groups were to arrive in the assault area by D plus 7 and to be operated by the Principal Salvage Officer (in MULBERRY B depot ship).

**U.S.**<sup>4</sup> The following maintenance and salvage units were to operate in the U.S. Sector:

	<b>OMAHA</b>	<b>UTAH</b>
L.C.M. (3) (salvage)	12	6
L.B.E's (British Craft)	16	8
A.R.L's (repair LST's)	1	1
	<i>(Adonis)</i>	<i>(Atlas)</i>
Pontoon floats (repair)	1	1
475 ton pontoon drydocks	1	1
Accommodation Ships	1	1

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

	<i>(Wheelock) (Robertson)</i>	
E-9 units (motorized repair teams)	2	2
	(3 shift)	(3 shift)
E-10 units (landing craft maintenance teams)	1	

These were to arrive progressively by D plus 7, to operate directly under the Assault Force Commanders until the NOIC's were firmly established ashore, and then to operate under the NOIC's.

(8) **Rescue Tugs**<sup>1</sup> were available at Plymouth, Portsmouth, Dover and Sheerness, to retrieve vessels in distress.

(9) **Colliers, Oilers and Water Tankers**<sup>2</sup> were to be included in suitable convoys to the assault areas. A reserve was retained in Spithead from D plus 3.

(10) **Cable Laying**<sup>3</sup> Six or more telephone cables were to be laid across the channel by ships of the British General Post Office.

(11) **A Despatch Boat Service**<sup>4</sup> of Motor Launches was to run 4 times each day between Portsmouth and the assault area.

(12) **Ammunition Barges**<sup>5</sup> Sixteen 1,000 ton barges were to be towed from Exmouth to W.T.F. area in three tows arriving on D plus 1, D plus 2 and D plus 3. Nine 300 ton barges were to be towed from Littlehampton to the E.T.F. area arriving on D plus 1.

(13) **Sunken Causeway**<sup>6</sup> units were to be towed to the assault area by Tugs, L.S.T's and Coasters arriving between D plus 1 and D plus 4. Five miles of causeways were provided.

(14) **Minor Landing Craft**<sup>7</sup> were to be sailed in groups for each assault force from Langestone and Poole to arrive p.m. on D day to augment the Ferry service.

(15) **Coast Guard Cutters**<sup>8</sup> 60 U.S. Coast Guard Cutters were allotted, 30 the W.T.F. and 30th the E.T.F. to assist in the rescue of personnel in distress at sea.

## H - Chronological Order of Events<sup>1</sup>

<b>Day and Time</b>	<b>EVENT</b>	<b>REFERENCE</b>
<b>D - 6</b>	C.O.B. I, II and II sail from Oban for assault area	ON 13 App. VI
<b>D - 3</b>	"X20" and "X23" sail from Portsmouth to mark Force J and S beaches	ON 7 P.5
<b>D - 2 A.M.</b>	First Coaster and M.T. convoys from Bristol Channel sail for I. of W.	ON 13 App. I
2000	American Assault Forces U2A and U2B from Dartmouth sail for UTAH beach	ON 7.
<b>D - 1</b>	"X20" and "X23" arrive off J and S Force beaches	ON 7 P.5
0700	O2a. O2B American Assault Forces sail from Portland for OMAHA	ON 7 App. I
1100	Assault Forces G1, 3, 4, 5, 6, 7, and 8 sail from Solent, for GOLD	ON 7
1200-2200	British follow-up Forces L1, 2, 3, 4 and 5 sail from THAMES for the E.T.F. area	ON 13 App. VI
1330-1400	British Assault Forces J1 and 2 (9th and 7th M.S.F) J 3, 4, 7 and 8 sail from SPITHEAD for JUNO.	ON 7
1500	American Assault Force U.1 sails from DARTMOUTH for UTAH	ON 7
1615	British Assault Force J14 sails from SPITHEAD for JUNO	ON 7
1740	14th and 4th M.S.F. commence sweeping No. 2 and 4 channels	ON 6 App. I
1830	18th and 7th M.S.F. commence sweeping No. 6 and 8 channels	

<b>Day and Time</b>	<b>EVENT</b>	<b>REFERENCE</b>
1900	6th, 9th, and 1st, MSF commence sweeping Nos. 5, 7, and 9 channels	ON Appx I

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1900	American Assault Force O.1 sails from Portland for OMAHA	ON 7
1940	16th and 31st MSF commence sweeping Nos.1 and 3 channels	ON 6 Appx. I
<b>D - 1</b> 1945	15th MSF commences sweeping channel No. 10	ON 6 Appx. I
2100	British Assault Force J 9 and 10 sail from SPITHEAD for JUNO	ON 7
2200	American Assault Force O.3 sails from PORTLAND for OMAHA	ON 7
2230	British Assault Forces G.15, 16, and 18 sail from SOLENT for GOLD	ON 7
2300	American Assault Forces O-3C, U-3C sail from SOLENT for OMAHA and UTAH	ON 7
2300	"BIG DRUM" units detach from Force "U" Lat. 49°50' N.	ON 3 6 (C)
<b>D-Day</b> 0001	G.M.I., J.M.I., S.M.I., (M.L.C.) sail from LANGSTONE for GOLD, JUNO, SWORD	ON 13 App.VI
0200	2 Airborne Divisions land, 1 behind VARREVILLE-CARENTAN beaches and 1 at CAEN astride river ORNE.	ON.1 p.31
0330	6 H.D.M.L's (GLIMMER) cause diversion in PAS DE CALAIS  8 H.D.M.Ls (TAXABLE) cause diversion off BRUNEVAL and FECAMP	ON.3
0530	4 H.D.M.Ls (BIG DRUM) cause diversion off BARFLEUR. Heavy air bombardment of assault beaches. Bombardment by warships of bombarding forces. Assault forces and Support Craft approaching beaches.	
0550 0555	D.D. Tanks and Assault craft touch down in OMAHA, UTAH, GOLD, JUNO and SWORD	

<b>Day and Time</b>	<b>EVENT</b>	<b>REFERENCE</b>
<b>H-hour</b>	L.C.T.s, L.C.T.(AVRE), L.C.A.(HR), L.C.P.(L), L.C.H., L.C.T.(R), L.C.F. and L.C.G.(L) touch down in all sectors	

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]



0605 0700	L.S.I.(L) touch down in all sectors	
0630	Commandos and S.S. with French troops assault OUISTREHAM and PORT EN BASSIN	ON 7 P.48
0700	L.C.I.(L) touch down in all sectors	
0715	Commandos land west of Queen Beach and advance above ORNE	
0730	L.C.T.s. (S.P.Artillery) touch down in all sectors	ON 7
1000	L.S.Ts and Rhinos arrive in all sectors	ON 7
1100 1900	"P" Tows sail from PORTLAND for assault area	ON 13
<b>D-day</b> 0700 1500	"D" Tows sail from DUNGENESS for assault area	ON 13
1300	L.S.Ts and Rhinos (J16 G18) arrive in JUNO and GOLD	ON 7
1500	American Follow-Up forces O4(a), U5(a) arrive E.T.F. area	ON 13 App VI
1600	British Follow-Up force L.1 (L.S.T., L.C.I. Coasters) arrive E.T.F. area	ON 10 App I
1700	American build-up convoys O4(b) U5(b) arrive in W.F.T. area. L.S.T. and Rhinos S.14 beach in SWORD	ON 13 App VI
1830	G.M.I., J.M.I., S.M.I. Groups of M.L.C. arrive in E.T.F. area British Follow-up Force L2 (L.S.Ts) arrive in E.T.F. area	ON 13

<b>Day and Time</b>	<b>EVENT</b>	<b>REFERENCE</b>
2000	Force REGULATOR arrives in E.T.F. area American build-up Convoys O5(a),(b), U6(a),(b), U.B.1 and B.B.1 sail from POOLE	Op.DEER ON 13
2130	LSD arrive in E.T.F. and W.T.F. areas and return when unloaded British follow-up Forces B.1 and 2 arrive in E.T.F. area American follow-up Forces O3C and U3C arrive in W.T.F.	ON 10

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

	area L.C.R.U. arrive in all sectors L.B.Os arrive in all sectors	
2200	G.M.S., J.M3 and S.M.3, groups of M.L.C. arrive in E.T.F. area	ON 13
2345	Desultory Bombardment of HOULGATE or BENERVILLE batteries	Op. DEER
2300 0700 <b>D plus 1</b>	"S" Tows sail from SELSKY for assault area	ON 13
<b>D plus 1</b> 0001	American follow-up Force U2 sails from KAMOUTH for W.T.F area.	
0030	Commandos assault HOULGATE Battery, Operation DEER or Commandos assault BENERVILLE Battery, Operation FROG	
0030	British follow-up forces L4 and 5 (L.S.T. beach in E.T.F. area	ON 13
0630	G.M.4, J.M.4, S.M.4 Groups of M.L.C. sail NAB for ETF area	ON 13
1000-  1200	3 L.C.R.U. and 2 K-9 units arrive in assault area  12 Tug Units and 6 Units of sunken causeway arrive GOLD and JUNO American follow-up force B.3 and U.4 arrive W.T.F. area. 28 sunken causeways arrive UTAH and OMAHA 4 Large barges arrive for UTAH and OMAHA.	ONAD 2  ON 14

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<b>Day and Time</b>	<b>EVENT</b>		<b>REFERENCE</b>
<b>D plus 1</b> 1400	C.O.B.1(3) and (4) C.O.B.2(1)	arrive in Assault area and construction of GOOSEBERRIES commences	ON 13
1430	C.O.B.2(2)		

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

1500	C.O.B.1(5)	
1500	American follow-up Forces U6(a), U.B.1 (ammunition	ON 14
1500	B.B.I (9-300 tons ammunition barges arrive E.T.F. area	ON 14
1500	G.P.O. ships begin laying cable from CHRISTCHURCH BAY to LONGUES and from SWANAGE to QUERQUEVILLE	
1600	American follow-up force O6(b) arrives in W.T.F. area	ON 13
1700	American follow-up force O5(b) and U.B.1 (ammunition barges) arrive W.T.F. area. <sup>1</sup>	ON 13
<b>D plus 2</b> 0600	4 Hospital Carriers arrive in the Assault Area	ON 13
0600 1400	"P", "S" and "D" tows arrive in the Assault Area	ON 13
1200	U.B.2 (4-1000 ton ammunition barges) arrives W.T.F. area	On 13
1300	C.O.B.3 arrives in assault area <sup>2</sup>	ON 13
D plus 3 0600- 1400	"P", "S" and "D" Tows arrive in the assault area.	ON 13

D plus 4	Daily build-up convoys sailing to and from Assault area should now be established.  58,000 MEN being landed daily 8,000 VEHICLES being landed daily.	
D plus 9	First PLUTO units sail FROM Southhampton	ON 21
D plus 14	Concrete dock ready in MULBERRY B	ON 16
D plus 16	MULBERRY "A" should be complete	ON 16
D plus 17	MULBERRY "B" should be complete	
D plus 18	4 discharge points (TOMBOLA) at PORT EN BESSIN completed	ON 21

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

D plus 20	First pipe line (HAMEL) laid to CHERBOURG (250 tons daily)	ON 21
D plus 75	Ten pipe lines (HAMEL) laid (2,500 tons daily)	ON 21

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## Footnotes

p.233 #1. Except where otherwise noted, all materials in the section on the enemy situation have been taken from: (1) XFPM 11, or 17 April 1944; (2) XFPM 12, of 26 December 1943; (3) ON 1, Paragraph 11 and 12; (4) ON 1, Appx. VII, Annex K; (5) ON 1, Appx VII, Annex D.

p.233 #2. The approximate location of the various German divisions on the eve of the invasion, and of boundaries of German Armies in France, is shown in the sketch after Section 1 of this Chapter. (See CTF 122 NEPTUNE Monograph of April 1944, revised, Folios J, K, and L.).

p.234 #1. During 1944, however, a last minute attempt had been made to tighten up the defense by constructing lines of field defenses on the first suitable high ground inland from the coast, but these were no more than support positions for the beach defense, intended to be used in sealing off any initial penetration made by the invading force. These field defenses were unable to give direct support to the coastal crust, however, except in those few cases where the high ground came close to the coast.

p.239 #1. The Germans had not constructed these before 1944. But in February of that year the placing of underwater obstacles on a large scale on open beaches in Northern France became a general policy. The progress of construction was continuous and fast. In one case seven staggered rows of stakes, 10 feet between units and 20 feet between rows, were inserted over a distance of 5,000 yards between 21st and 28th February 1944. In an other case, 2,300 yards of double row hedgehogs or tetrahedra were laid in four days at a spacing of 26 feet between units, and 100 feet between rows.

p.240 #1. The obstacles were not connected by chains, cables, or wire. The fact that short stretches of different obstacles were often intermingled indicated the urgency with which the work was done. At one point, for instance, a line of Element C was moved down from a strong point at the back of the beach.

p.241 #1. Few of them had an effective range as great as this, but, on the other hand, one battery in the Pas de Calais area had been known to shoot more than double that distance.

p.242 #1. Prior to 1943-44, the Germans made it a practice to site the gun in an uncovered position. This was preferred to the pill-box proper as the open position gave a much greater field of fire. Nearby concrete shelter was provided for personnel who served a number of open fire positions. However, by 1944, the Germans had revised their scheme and were covering all fire positions with concrete as rapidly as possible. Pill-boxes and casemates were usually included in one master network which provided accommodation for personnel, ammunition, stores and so on.

p.243 #1. Figures taken from CTF 122 NEPTUNE Monograph of April 1944, revised in May, folios J, K, L. These were obtained from FUSAG.

p.243 #2. When the Caen sector was selected in August 1943, there was only one division in the entire sector. (See Appreciation and Outline Plan).

p.244 #1. When they had a third regiment, it was usually composed of non-German troops.

p.244 #2. See CTF 122 NEPTUNE Monograph of April 44, revised, Folios J, K, and L.

p.245 #1. This would make a total of 8 divisions, which would be the maximum the Germans could deploy on D-Day. 3 static in the immediate NEPTUNE area, 2 static located very nearby and 3 mobile reserves. This 8 compared with 7 which the Allies would land.

p.246 #1. Corresponding to the 15 German divisions on D plus 3, the Allies would have landed approximately 12 divisions.

p.246 #2. These sketches were taken from CTF 122 NEPTUNE Monograph of April 1944, revised, Folios J, K, and L.

p.246 #3. CCS 300/3 of 18 November 1943.

Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]

p.246 #4. By D-Day both had become unserviceable. (See NCWTF NEPTUNE Monograph).

p.247 #1. ON 1, Para. 10.

p.248 #1. ON 1, Appx. VII, Annex K.

p.249 #1. ON 1, paragraph 12.

p.249 #2. ANCXF report, Appx. 1.

p.250 #1. The figures given here have been taken from ON 11, Appx. IV.

p.251 #1. An appreciation of the size of German specialized anti-shipping forces available was hard to make, owing to the high degree of flexibility possible and to the use of many types of aircraft. It was clear, however, that all forms of attack could be met by available Allied air forces.

p.252 #1. One main objective of Allied air forces was to disrupt German air fields within 150 miles of the assault area, and to make them unusable. Early construction of Allied air fields in Normandy was also a major objective. (See Chapter IV, Section 3B and 3C.)

p.253 #1 These were the prefabricated harbors (MULBERRIES), the sunken blockship shelters (GOOSEBERRIES), the Gasoline pipelines (PLUTO, TOMBOLA, AMATHEA).

p.261 #1 On the three-divisional basis the capture of Cherbourg was scheduled for D plus 14, on the five-divisional basis it was scheduled for D plus 8. Actually it was captured on D plus 21 (27 June). See ANCXF war diary of 27 June.

p.262 #1 The possibility of capturing Le Havre Peninsula by a subsidiary seaborne and airborne landing was examined. Such an operation might possibly have succeeded in capturing Havre; but, owing to complete lack of suitable defensive positions West of the line of River Somme, there was little hope of withstanding German counter-measures unless the main Allied forces simultaneously crossed the Seine in strength. Indeed, the Seine ports could not be brought into operation until the area south of the Seine was clear of the enemy and the Allied armies stood in adequate strength on the line of the Somme and covering Paris.

p.264 #1 The British call this formation a "Brigade Group".

p.271 #1 A DD tank was an ordinary tank specially waterproofed and equipped with an inflated canvas belt (like water wings) and special means of propulsion through the water. These were to give the infantry crossing the open beaches special heavy fire power.

p.273 #1 Electronic means were to be employed to prevent the Germans from using Radar to detect the approach or to train their batteries.

p.275 #1 The possible D-day H-hour combinations were:

June 5 0640                  June 18 0600

June 6 0720                  June 19 0635

June 7 0730                  June 20 0720

Actually, in 1944, during the 18, 19 and 20th of June, the greatest summer storm on record broke.

In view of the promise to Russia to launch an invasion in May, General Marshall had wished D-day to be 31 May or earlier. Tidal-Luna-day break factors would have permitted landings only on the 8th, 9th, or 10th May on the 22nd, 23rd or 24th May. (See XFP 9 of 10 January 1944).

p.279 #1 All materials in this section have been taken from NEPTUNE Initial Joint Plan, RJC 1004 of 1st February 1944. This was prepared jointly by the three service C's-in-C and issued under the direction of the

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Supreme Commander. Though later amended in many particulars, it was the basic joint plan on which the plans and orders of the various services were built.

p.279 #2 See Chapter II.

p.283 #1 The plan specified precisely the course of the landward boundary line for exact details see NJC 1004 of 1 February 1943.

p.287 #1 SHAEF (44) 22 of 10 March 1944, Appx C

p.289 #1 SHAEF (44) 22 of 10 March 1944, Appx D.

p.290 #1 SHAEF 44 (22) of 10 March 1944, Appx E.

p.293 #1 All figures relating to seagoing forces were compiled from ON's and Admiralty M.O.D. 1295/44 of 31 May 44.

p.304 #1. The materials in # A were taken from ON 1.

p.305 #1. ON-4

p.306 #1. ON-4

p.307 #1. ON-4

p.309 #1(1) Support Craft consisting of L.C.S.(L) (2) and (S), L.C.G., L.C.F., L.C.T.(R), (H.E.), (A) and (B.?), L.C.A. (H.R.) and L.B.F. will give support fire in addition to Bombarding Ships. (See Section VIII).

p.310 #1. Materials for # C to here were taken from ON-7

p.310 #2. ON-10

p.310 #3. ON-9

p.311 #1. Materials on the Build-up were taken from ON-13; See also NJC 1004 of 1 February 1944, Appx. R.

p.313 #1. ON-6

p.316 #1. ON-8

p.319 #1. ON-3

p.319 #2. ON-5; ON-11; ON-1.

p.320 #1. (1) CTF 122 Op Plan 2 - 44 entitled ONWEST - 2 of 21 April 1944, - text and Annex C. (2) British Assault Area Defence Orders (BAADO) of 30 April 1944. (3) ON-9.

p.322 #1. ON-2 and AFNP - Appx 17.

p.323 #1. ON-11

p.325 #1. ON-16

p.328 #1. ON-16

p.329 #1. ON-21

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p.329 #2. Conum Drums were large floating drums round which the pipe was wound and which unreeled as they "rolled" across the water leaving a line of pipe behind.

p.329 #3. ON-14 Section A

p.330 #1. ON-14 Section B

p.330 #2. ON-14 Section D

p.330 #3. ON-14 Section E, and ON-14 Appx III.

p.330 #4. ON-14 Section E, and ON-14 Appx III, and Land Crab History Page 51 ff.

p.331 #1. ON-14 Section E

p.331 #2. ON-14 Section F

p.331 #3. ON-14 Section G

p.331 #4. ON-14 Section H

p.331 #5. ON-14 Section J

p.331 #6. ON-14 Section K

p.331 #7. ON-14 Section L

p.331 #8. ON-14 Section N.

p.332 #1. H-hour has been taken as 0600. Build-up convoys are referred to by self-evident letters ON13, Appx 9.

p.336 #1. During day: 50 hauling off buoys laid for coasters. Trots for BOMBARDON being laid. MULBERRY control ships and tenders arrived with E.W.C.I.A. and E.T.M.1 (ON 16)

Buoys 12A to 12G and No.14 laid (ON 17)

8 Blockships sunk in MULBERRY A (ON 16)

8 Blockships sunk in MULBERRY B

p.336 #2. BOMBARDON units are being connected up. MULBERRY H.Q. ships arrive with EBP2 and EWP1. PLUTO survey ships sail for PORT EN BESSIN. 14 Blockships sunk in each MULBERRY.



Source: Historical Section, COMNAVEU. "Administrative History of U.S. Naval Forces in Europe, 1940-1946." vol. 5. (London, 1946) [This manuscript, identified as United States Naval Administrative History of World War II #147-E, is located in the Navy Department Library's Rare Book Room.]