RUNNING THE GAUNTLET

The Royal Navy in RAID ON ST. NAZAIRE

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Introduction

This article is based on what I have learned from playing 81,000 games of *RAID ON ST. NAZAIRE*. Okay, I exaggerate somewhat. *I* didn't actually play 81,000 complete games from start to finish. However, I was able to simulate on a computer virtually all of the naval aspects of the game. From those simulations, I believe you will have a better idea of what to expect in *RAID ON ST. NAZAIRE* and will pick up some hints on how to better play the game.

There are two distinct phases in this game. The first, or the naval phase, consists of transporting commandos by naval vessels to their Landing Zones and attacking selected installations with torpedoes and naval gunfire. The second, or land phase, consists of those commandos attacking specified shore installations such as bridges and drydock machinery in the midst of mobilizing German infantry. While there are a few links between the naval and land phases of the game, to a large extent they can be considered independently. This article is concerned with naval operations; land operations are considered herein only to the extent that they affect the naval aspects of the game.

At first, it would appear that the Royal Navy can win the game with very little help from the commandos. The Southern Caisson, once rammed by the destroyer *Campbeltown*, can usually be blown up for 12 Victory Points. The torpedo boats are capable of destroying the two seaward Lock Gates for four Victory Points each and the floating battery *Sperrbrecher* for another one. And two-tenths of a Victory Point is awarded for each of the 226 crew and commando sections successfully evacuated back to Britain. Therefore, in principle, the Royal Navy could accumulate 66 VP ($12+2\times4+1+.2\times226$) on its own out of the 70 required to win. Commandos could pick up the remaining victory points by blowing a few installations.

It is important to recognize that virtually all of the demolition targets are initially unprotected but that, as time passes, more and more German infantry organize themselves into effective units that pose a threat to demolition squads. Furthermore, any delay in landing commandos needlessly exposes them to risk from German guns firing at their naval transports. This argues for quickly landing the commandos.

Therefore, at first glance, the mission of the Royal Navy in *RAID ON ST. NAZAIRE* is clear: suppress shore batteries with naval gunfire, ram the Southern Caisson with the DD *Campbeltown*, land as many commandos as possible as quickly as possible, torpedo the Lock Gates, pick up commandos after they have blown a few targets, and then return to Britain.

If you have played through *RSN* a couple of times, you probably realize that the above description of the Royal Navy's mission is wildly optimistic. Unfortunately, German shore batteries and emplaced guns turn the St. Nazaire channel into a devastating turkey shoot. This article is intended to indicate reasonable expectations for the course of naval operations and to explore some options that are available for minimizing losses. These objectives are accomplished by means of a computer simulation which, except in a few minor respects, faithfully reproduces all aspects of naval operations for a game. To give some idea of the complexity of the computer program, it consists of over 1100 BASIC statements (many of which must be executed numerous times in a game). Even so, all the naval operations can be performed in several seconds on a personal computer rather than in hours as would be required in an actual game. This makes it possible to test out various tactics in thousands of games.

The ability to play thousands of games is particularly important with *RSN* because most tactical choices involve subtle tradeoffs; it is difficult to tell in advance whether a particular tactic will help or hurt on balance. The only way to tell whether a tactic will be beneficial is to try it out in games. However, due to dramatic changes in the character of the raid from game to game as a consequence of die rolls, it is virtually impossible to ascertain the net effect of a particular tactic by playing only a few games. One cannot tell whether a good outcome was due to luck or whether it was due to superior tactics.

Fortunately, it *is* possible to simulate the naval aspects of the game on a computer because there are a small number of decisions that need to be made and, by and large, those decisions can be made before the game even begins. Indeed, perhaps the most important decisions concerning naval operations *must* be prespecified. The rules require that the destroyer *Campbeltown* proceed with all speed to ram the Southern Caisson and that the Landing Zones for commandos must all be specified before the game begins.

The Computer Simulation

The elements of the Sequence of Play that pertain to naval actions are fully reproduced in the simulation, except that "Open Sea Encounters" are omitted. In the interests of simplicity, I made several decisions up front that might be different in an actual game as it progresses. In some respects, these simplifications may make the game more realistic. Like nearly all wargames, *RAID ON ST. NAZAIRE* assumes the commander has far more information and control in the heat of the battle than is probably realistic. The simplifications I have made can be viewed as a part of the operational orders that are issued to commanders *before* the raid commences. In the chaos of the raid itself, it is unlikely that the flotilla commander could successfully communicate major changes in plans to boat commanders and have them executed.

The simplifications I have made are listed below:

1. *Boats do not pick up passengers.* In principle, crew and commandos from stricken boats can be picked up at a cost of one movement factor. Those who are rescued serve no function on the rescuing boat, but earn Victory Points if the rescuing boat makes port in England. However, the loss of a movement factor can well determine the difference between a successful mission for a boat or disaster. In the simulation, I have ordered all boat captains to accomplish their primary objective and return to Britain without stopping to pick up passengers. While this seems inhumane, few boats manage to make it safely home anyway. Attempting to pick up survivors would most likely simply add to the litter at the bottom of the St. Nazaire channel. For the same reason, boat commanders are not to tarry to evacuate commandos.

2. *Targets of covering fire.* Royal Navy gunfire can knock out German guns and searchlights temporarily or permanently. I ordered flotilla commanders to first aim for the gun on the Old Mole (336) which threatens ships and commandos landing at the Old Mole—and then for guns in 344, 311, 312, 300A and 300B.

3. *Wynn's boat.* The torpedo boat commanded by Wynn carries no commandos but does carry a delayed-action torpedo which may explode at the end of the game. Wynn was ordered to attack the Old Entrance Floating Gate. This target was selected since surviving *Campbeltown* commandos need some over-the-water escape route into the Old Town. Instead of blowing up the Old Entrance Floating Gate immediately, it can be preserved as a bridge to the end of the game if attacked with the delayed action torpedo.

4. *Nock's boat.* Nock's boat carries no commandos and, contrary to what is printed on the log, it carries no torpedoes. I ordered Nock to proceed directly to Sea Area D and to remain there one turn, after which he can make for the Open Sea. Nock can serve a useful purpose in Sea Area D by drawing Dockside Defensive Fire away from other boats. (German guns whose primary coverage is Sea Area D will then fire on Nock rather than at boats in the Old Entrance area.)

5. *No forced landings.* Forced landings can be carried out in an area other than the boat's planned landing zone (336 on the Old Mole or 366 at the mouth of the Old Entrance) after the 0152 turn on a die roll of "1" or "2". However, very few, if any, boats with commandos are typically afloat and mobile after the 0152 turn. In the interests of simplifying the program, I ruled out forced landings. Boats were required at all costs to land their commandos in their planned landing zones.

6. *Interface with land operations.* German guns which are successfully assaulted by commandos cannot fire at vessels. However, there are no Victory Points for taking out a gun and assaulting a gun places the commando at risk from return fire if the assault does not succeed.

The *Campbeltown* commandos more or less have to attack the guns on the Pump House (222) in order to meet their demolition objectives. In the simulation, I ordered the *Campbeltown* commandos, once ashore, to take up postions to fire at the Pump House guns, attempting to put them out of action. If the commandos are unsuccessful, the guns fire back. In the turn following the landing, surviving commandos move directly to the Pump House and attack the guns with grenades, while demoliition commandos provide supporting fire from adjacent areas. On the following turn, the commandos withdraw. In an actual game, a player might choose not to withdraw at that point. However, by following the plan I have suggested, the simulations give a pretty good idea of how successful the initial assaults on the Pump House guns are likely to be. The steps involved in assaulting the Pump House guns I have outlined above were simulated precisely as they would occur in a game.

Commandos who land at the Old Mole are subject to fire from guns in 336 and 344 on the turn in which they land. To simplify matters, in the simulations I assumed that demolition teams, if unburdened with wounded, would proceed directly to 335. No more than two assault teams would remain in area 336; other assault teams would also move to area 335. The two most effective commandos in area 335 are then used to attempt to suppress guns 336 and 344, with gun 344 being given

the higher priority. The assault teams in 336, if any, then attack that area's gun with grenades. If the guns are still functioning after these attacks, they fire at the commandos. On the second turn ashore, I had all surviving commandos move inland toward VP targets and out of range of guns 336 and 344.

Choosing a Plan of Operations

Given the above assumptions, four remaining choices had to be made, and those choices defined my operational plans. The choices pertained to the following aspects of the game:

1. *Planned Landing Zones.* If the default Landing Zones are selected, six boats are detailed to land commandos at the Old Mole (336) and seven at the Old Entrance (366). However, a player can designate either landing zone for any boat before the game begins. The Old Mole is the closer of the two landing sites and hence a successful landing is more likely in this area. Furthermore, if all the commandos are landed on the Old Mole, the guns located there can be overwhelmed at lower risk to the commandos. However, there are beneficial aspects to sending the boats the extra distance to the Old Entrance. First, some commados can be landed closer to their primary targets. Second, boats that enter the Old Entrance Sea Zone draw Dockside Defensive Fire away from the *Campbeltown* if it is on fire and this may make the difference between a successful and an unsuccessful raid. Since the net effects of switching landing zones is not obvious, I tried out several combinations. In each operational plan I specified that all of the boats transporting commandos would use either: a) the default planned landing zones; or b) the Old Mole landing zone; or c) the Old Entrance landing zone.

2. *Objectives of the torpedo boats.* Each torpedo boat can launch one torpedo attack in a game against the floating gun platform *Sperrbrecher* or one of the two lock gates (212 or 313). In a torpedo attack, a die roll of "3-4" damages the target and a die roll of "1-2" (or "3" if previously damaged) destroys the target. If destroyed, the floating gates are worth four Victory Points each. There is only one Victory Point for sinking the *Sperrbrecher*, so there is some question whether it should be attacked by torpedoes. On the other hand, the *Sperrbrecher* does carry two guns that menace passage into and out of the St. Nazaire channel. On the other hand, a torpedo launched against the flak ship cannot be launched against a 4-point target.

The torpedo boats commanded by Irwin and Boyd carry no commandos. Hence, they have two possible missions: launching torpedo attacks and drawing German fire away from other vessels. Whether or not the *Sperrbrecher* is designated as the primary target for torpedo attack, each of these boats should be assigned one of the two gates as a target. When they are assigned to the Avant Port gate, they also draw Dockside Defensive Fire away from boats in Sea Zone A. When they are assigned to the Old Entrance lock, they draw fire away from other boats in Zone C. This latter aspect is particularly important if the *Campbeltown* is on fire and has just limped into Zone C and must spend a turn there before ramming the Southern Caisson. Again, since the net effects are not obvious, I tried out various combinations of torpedo boat objectives in the simulations. In each operational plan I specified either that: a) both boats would attack the Avant Port lock; or b) Irwin would attack the Old Entrance gate and Boyd the Avant Port gate; or c) both boats would attack the Old Entrance lock. (Irwin provides the most effective screening for the *Campbeltown* since it is "closest" to the destroyer when DR selections are made to take hits.)

There is the additional question of the conditions under which the torpedo boats should be released to return to England. At most, a boat that does not carry passengers is worth only 1.2 Victory Points if it manages the return voyage to safety. By simply drawing German fire away from boats that carry commandos, Irwin and Boyd can serve an important function. Accordingly, when a torpedo boat expended its last torpedo on the *Sperrbrecher*, it was nevertheless ordered to its secondary target to carry out a feint attack.

3. *Dealing with the Sperrbrecher.* The boats commanded by Fenton and Rodier carry both commandos and a torpedo. After landing their commandos, these boats were ordered to attack the floating gate at the Old Entrance. However, if an attack on the *Sperrbrecher* had been ordered but Irwn and Boyd had failed to sink it, Fenton and Rodier might be ordered to torpedo the *Sperrbrecher* before landing their commandos. There are arguments on both sides of this issue. On the one hand, taking out the *Sperrbrecher* would reduce the number of German guns that harass the flotilla. On the other hand, the delay to launch torpedoes might easily result in disaster for Fenton and Rodier and their commandos aboard. In each operational plan, I specified either that: a) no attack would be made on the *Sperrbrecher*; or b) Irwin and Boyd would attack the *Sperrbrecher* alone; or c) Fenton and Rodier would assist Irwin and Boyd, if need be, in the attack on the *Sperrbrecher*.

4. *"C" losses inflicted on crew or commandos?* The *Campbeltown* rams the Southern Caisson unless it is sunk, and the only way it can be sunk is by loss of all its crew sections. Crew sections are automatically lost whenever there is an "MC" or "KO" damage die roll on a *Campbeltown* hit. In addition, at the option of the player, "C" losses can be taken from either the crew or the commandos on a boat. While electing to take "C" losses from commandos rather than from crew usually won't make the difference between sinking or a successful landing, occasionally it does. The cost, of course, is weaker commando units. In each operational plan I specified either that whenever possible: a) "C" losses be taken from crew; or b) "C" losses be taken from commandos on the *Campbeltown* and from crew on all other boats; or c) "C" losses be taken from commandos on all vessels. ("C" losses are never taken from the crew if doing so would sink the vessel.)

The Results

An operational plan specifies the choices that were made concerning the planned landing zones, the objectives of the torpedo boats, tactics for dealing with the *Sperrbrecher*, and whether "C" losses would be taken from the crew or the commandos aboard. Since there are three alternatives for each of these four choices, there are 81 (3x3x3x3) different operational plans in my model. Each of these operational plans was used in 1000 different games.

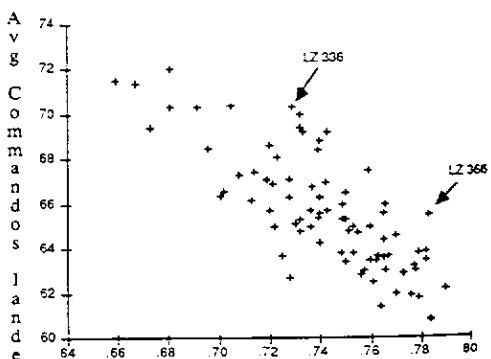
The single most important outcome from an operational plan is the frequency with which the *Campbeltown* succeeded in ramming the caisson. If the *Campbeltown* is sunk and therefore cannot ram the Southern Caisson, the raid might as well be scrubbed. Therefore, to evaluate the success of the operational plans, I focused on the frequency with which the destroyer rammed the caisson and, *given that the Campbeltown did ram the Southern Caisson*, the average number of commandos landed, and the average Victory Points won. I computed the latter two statistics only for those games in which the DD did ram the caisson since that is a precondition for a successful raid. (Note that even if the *Campbeltown* does ram the caisson, its demolition charges might fail; even so, I included all games in which the Southern Caisson was rammed in the set of games that might lead to a victory for the British and for which statistics were computed.) The Victory Points are for crew sections returned to Britain (since I assume that all boats that make it to the Open Sea make it safely back to Britain), the *Sperrbrecher*, the floating gates destroyed by torpedoes, and destruction of the Southern Caisson. The commandos landed are net of any losses at sea and any losses ashore due to fire from the Pump House guns or the Old Mole guns (336 and 344).

As it turned out, the operational plans had very little effect on the average Victory Points, which ranged from a low of 13.6 to a high of 16.9 across all 81 operational plans. (Remember these averages were computed for only those games in which the *Campbeltown* rammed the Southern Caisson; across *all* games, the averages would be lower.) This differential of approximately three VP is not large enough to dictate the frequency of operational plans.

The operational plan had more of an impact on the frequency of successful rammings and on the average number of commando sections landed. The frequency with which the destroyer successfully rammed the Southern Caisson ranged from a low of 66% to a high of 79% across all 81 operational plans. In those games in which the Campbeltown did make it to the Southern Caisson, the average number of commando sections landed ranged from a low of 60.8 to a high of 72.0. While these differences across operational plans are not dramatic, they are large enough to be noticeable.

It would be convenient if a single operational plan yielded both the highest frequency of successful rammings *and* the largest number of commando sections landed. Unfortunately, that did not happen. To a large extent, in *RAID ON ST. NAZAIRE* you don't get something for nothing. The frequency of ramming usually can only be increased at the cost of decreasing the number of commando sections that make it onto the shore. Measures that increase the survivability of commandos (i.e., switching their landing zone to the Old Mole) often also increase the vulnerability of the *Campbeltown*. This tradeoff between the two objectives is graphically illustrated in Figure 1.

Figure 1: The Trade-Off between the Frequency of Successful Rammings by the DD *Campbeltown* and the Number of Commandos Landed. Each point on this plot represents the average result across 1000 games for a single operational plan.



A plan that dominates all others would appear in the upper right-hand corner of Figure 1. As you can see, there is no such dominating plan. However, most players would probably choose either the operational plan I have labelled "LZ336" or plan "LZ366" which do stand out somewhat from the others. It is possible to find a plan that yields more successful rammings than LZ366, but only at the cost of fewer commandos ashore. It is also possible to find a plan that yields more commandos than LZ336, but only at the cost of fewer successful rammings by the *Campbeltown*.

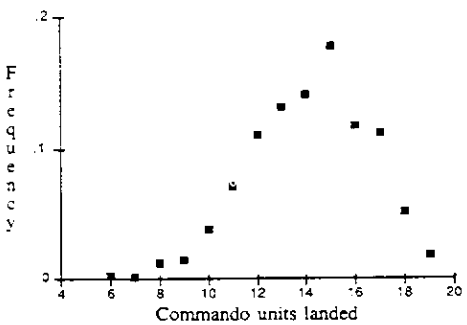
These two operational plans are very similar. In both plans, all torpedo boats (including Fenton and Rodier) are ordered to sink the *Sperrbrecher*; "C" losses are taken from commandos on the *Campbeltown* and from crews on other boats; and both Boyd

and Nock are assigned to attack the Avant Port lock. However, the planned landing zones are different for the two operational plans. The planned landing zone for plan LZ336 is the Old Mole; the planned landing for LZ366 is the Old Entrance area 366. Landing in 336 rather than 366 brings the landing zone closer to the boats' starting position and hence more commandos make it ashore. On the other hand, the boats do not draw Dockside Defensive Fire away from the *Campbeltown* in Zone C in those instances in which the destroyer is limping toward the Southern Caisson. So the effects of shifting all boats from one landing zone to the other are offsetting shifts in the probability of ramming and in the average number of commandos landed.

Taking plan LZ336 first, the DD *Campbeltown* successfully rammed the caisson in 72.9% of the 1000 games in which the particular plan was used. In the other 27.1% of the games, the raid was called off and the game was considered lost. The remaining statistics in the top section of Table 1 are for 729 games in which the *Campbeltown* rammed the Southern Caisson and there was some prospect of a successful raid. Many of these statistics are gloomy and may come as a shock to all but the most experienced *ST. NAZAIRE* players. An average of slightly under five boats make it to the Open Sea after accomplishing their missions. And these ships are manned by an average of only 18.5 total crew sections. That's less than four Victory Points for evacuees! What is more, these ships haven't made it back to England yet. They still have to run the perils of attack at sea from the Luftwaffe and Kreigsmarine, which I did not simulate.

The statistics for commandos landed look more encouraging. At the start of the game, there are a total of 19 units with six sections each. Of the 19 units, an average of 14.2 make it to shore. However, note that this statistic refers to only the games in which the *Campbeltown* rammed the caisson and so landed its six commando units. Hence, an average of only 8.2 of the 13 units that are not on the destroyer make it into action. And, among the commandos who make it to shore, there has been an average of 17% attrition due to "MC" and "C" damage hits and losses to gunfire from shore.

Figure 2: The Results of Operational Plan LX336. Relative Frequency of Number of Commando Units landed for Games in Which the *Campbeltown* successfuily Rammed the Southern Caisson.



If you are hoping that covering fire from the Royal Navy would neutralize the German guns, forget it. On average, there were only two covering fire hits *in an entire game*!

If the *Campbeltown* commandos do "hit the beach", they are fairly effective against the two Pump House guns. Within the first two turns they nearly always destroy at least one of the guns, and destroy both of them 59% of the time.

Even though all four torpedo boats are ordered to sink the *Sperrbrecher*, they succeed only 73% of the time. And the Avant Port lock, which is assigned as a secondary mission for two of the boats, is destroyed in only 3% of the games. The Old Entrance lock gate, which is assigned to three of the torpedo boats (including Wynn), is destroyed in 54% of the games. (This discrepancy is due to the amount of fire Nock and Boyd draw upon themselves when they enter the Avant Port zone and to the fact that they are more likely to have expended their torpedoes on the *Sperrbrecher* than Fenton or Rodier.)

Each game was played until all ships were either sunk, dead in the water, or in the Open Sea. This required an average of seven game turns (42 minutes in the scale of the game) and ranged from a low of four turns to a high of eleven. It is sobering to realize that in just 40 minutes the bulk of the flotilla is usually reduced to burning hulks and flotsam.

It is interesting to note the high degree of variability in the games. The number of commando units that make it to shore, given that the *Campbeltown* has rammed the caisson, varies all the way from six to 19 units. The relative frequencies for plan LZ336 are displayed in Figure 2. While the average *is* 14.2 units landed, just about anything could happen in any particular game. *RAID ON ST. NAZAIRE* is not a solitaire game that can be played once or twice and then forgotten because it holds no surprises. Every game is likely to be quite different from the last one that was played.

Statistical analysis of the results for all 81 plans revealed the magnitudes involved in some of the tradeoffs. On average across all operational plans, if the torpedo boats are ordered to bypass the *Sperrbrecher*, the frequency of successful rammings increases by about 2% and the number of commandos landed decreases by about two sections. The frequency of successful ramming increases because, if the torpedo boats bypass the *Sperrbrecher*, they are more likely to be in a Sea Zone in which they will draw Dockside Defensive Fire away from the destroyer.

If "C" losses are taken against the crew on the *Campbeltown* rather than against the commandos, the frequency of successful rammings decreases by about 4%, while the upside revelation is that a little more than two commando sections on average are saved to fight on land. If "C" losses on the other boats are taken against the commandos, the net effect is a decrease of about two and a half commando sections ashore. The direct losses to the commandos apparently outweigh the additional losses due to sinkings.

If the default landing zones are used instead of the Old Mole landing zone, there is an increase of about 3% in the frequency of successful rammings, but the cost is an average loss of about three and a half commando sections.

In summary, while the computer simulations did not unlock the key to success in *RAID ON ST. NAZAIRE*, they did provide insights into the extent of the carnage that can be expected in a typical game. The simulations also appear to support certain tactical choices and to provide indications of the tradeoffs involved in some of those choices. Now, when you must face these decisions, at least you will be better informed of the consequences.

Table 1

The Results of Operational Plan LZ 336

Frequency the Campbeltown successfully rammed the Southern Caisson in 1,000 games: 72.9%

Statistics concerning the 729 games in which the Campbeltown successfully rammed:

	mean	*max*	*min*	*std dev*
functional ships in the Open Sea	4.7	14	0	2.9
crew on board functional ships in the Open Sea	18.5	67	0	12.8
commando units landed	14.2	19	6	2.4
total commandos landed	70.3	107	18	15.5
total covering fire hits	2.3	10	0	1.6
German guns destroyed	4.0	8	1	1.3
number of turns in the Naval game	7.0	11	4	1.1

frequency	
Sperrbrecher sunk	73%
Avant Port Floating Gate destroyed	4%
Old Entrance Floating Gate destroyed	56%
Pump House guns destroyed:	
Both	59%
One	36%
Neither	5%

The Results of Operational Plan LZ 366

Frequency the Campbeltown successfully rammed the Southern Caisson in 1,000 games: 78.3%

Statistics concerning the 783 games in which the Campbeltown successfully rammed:

	mean	*max*	*min*	*std dev*
functional ships in the Open Sea	3.4	15	0	2.8
crew on board functional ships in the Open Sea	13.2	68	0	12.0
commando units landed	12.7	19	6	2.7
total commandos landed	65.5	104	26	15.2
total covering fire hits	2.2	9	0	1.7
German guns destroyed	3.4	7	0	1.2
number of turns in the Naval game	7.1	11	4	1.1

frequency	
Sperrbrecher sunk	74%
Avant Port Floating Gate destroyed	2%
Old Entrance Floating Gate destroyed	55%
Pump House guns destroyed:	
Both	58%
One	37%
Neither	5%