ROYAL CANADIAN NAVY

SEAMAN'S HANDBOOK

BRCN 3029

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THE ROYAL CANADIAN NAVY

The 21st day of January 1960

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NAVAL SECRETARY

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PREFACE TO THE DIGITAL VERSION

This book was written in 1960, over fifty years ago and eight years before the demise of the Royal Canadian Navy. At the time it was the standard Basic Training handbook of the RCN… a navy where every man and woman needed to be a seaman first and a tradesman or officer second. This book gave recruits the theoretical knowledge that, with adequate on-the-job training would turn them into a proficient naval sailor.

Even though almost everything else in today's navy is different, the knowledge you will glean from this book can still go a long way to making you a better sailor.

Every effort has been made to make this digital edition identical to the original. The page layout is identical and it has not been corrected or "modernized" in any way. By today's standards parts may seem sexist or politically incorrect, after all, no women served at sea in the RCN, that is for you, the reader to decide.

The only nod to the digital format is that the contents of both the Table of Contents and Index have been digitally linked to their respective places in the book.

I hope you enjoy discovering what life was like during the last era of the RCN.

Gerry Curry, CD
Cedar Lake, Yarmouth Co, NS

August 2010

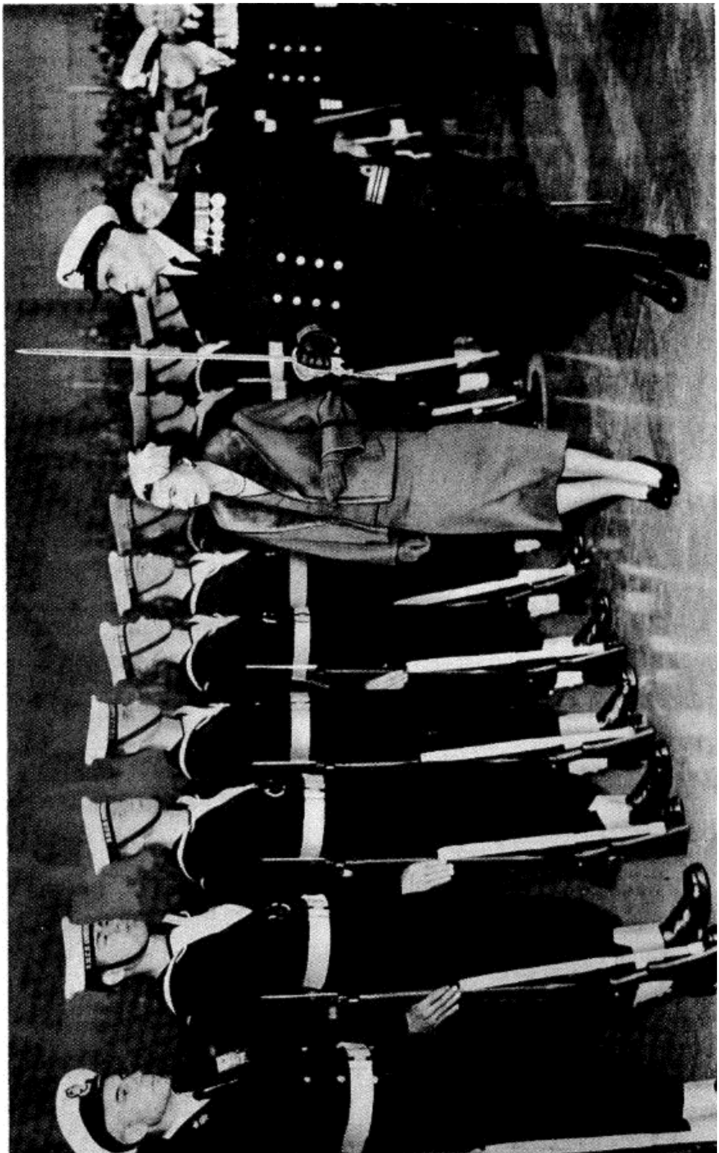
PREFACE

This book has been written for the men and women who have recently joined the Royal Canadian Navy. Every person in the Navy is firstly a seaman and secondly a tradesman. A seaman has many general duties and must have much general knowledge of the Navy regardless of his trade or rank. It is this vast field of general naval knowledge that forms the basis for this book.

This book is not to be regarded as a trade manual. It is just as applicable to the cook as it is to the boatswain. Both are sailors and as such should have the same general knowledge of all things that affect their lives as sailors. Each is, of course, also a specialist in his own trade and each must be specially trained for his trade. To assist junior tradesmen to become efficient in their trades instructional manuals are provided for most trades. The new seaman has, therefore, two books to guide him: this *Seaman's Handbook* on how to become a well informed seaman, and his trade manual on how to become an efficient tradesman.

Sometimes there are several versions of such things as traditions, customs, origin and meaning of naval terminology, etc. Every effort has been made in writing this book to use the most authentic, most commonly used or most widely accepted versions.

It would be impossible to include in one small book all the general knowledge that a sailor might ever require. This book is confined to the most important factors of naval life with which the man should become familiar early in his naval career.



CHAPTER 1

THE STORY OF THE ROYAL CANADIAN NAVY

The answers to a great many of the whys and wherefores of the navy are found in the history of the RCN. It is a tale filled to the brim with political intrigue, odd characters, heroes and villains. Heroines in the form of ships play a prominent part in the story. In fact, it has all the ingredients of a full length epic film thrills, tears, laughter, toil and blood..

The story is not yet ended. Indeed it may not be halfway through. So for those of you who are having the frustrating experience of coming in the middle of the picture, this chapter is designed to give you a brief sketch of what went on before.

It all began back in 1880. Canada had been a nation then for only thirteen years, and our grandfathers were busily carving a civilization out of the wilderness. Young Canada was facing the cruel world for the first time, but because of its youth it was still staying fairly close to mother's side – mother being "the old country," Great Britain.


Figure 1-1 HMS Charybids

So it happened that one day the Governor General, at the request of the government, sent a despatch to the authorities in London to the effect that Canada would be happy to use a warship for training purposes if the British Government would provide such a ship. Our government was, quite rightly, worried about the fact that if a war should occur, Canada's Atlantic coast was virtually undefended against foreign raiders.

Their Lords Commissioners of the Admiralty, the governing body of the Royal Navy, studied this dispatch, and, deciding that the request was a reasonable one, cast about for a ship to give to Canada.

Now it happened at that time that an ancient steam corvette named Charybdis was struggling home to Britain from the China Station. Having no plans for this vessel, Admiralty decided that Canada could have her, and the offer was gratefully acepted. But fate was to take a hand.

On arrival in Great Britain it was found that Charybis' boilers were practically warn out. Canada was forced to replace them at her own expense. Eventually the old vessel was coaxed across the Atlantic to Saint John, N.B.; but while she was alongside a gale blew up. The fickle Charybdis broke loose and wrecked a good deal of shipping in the harbour. Soon afterward, alongside once more, two Saint John citizens fell through her rotten gangplank and drowned.

This was too much. The Canadian Government asked Admiralty to kindly take back their gift, and poor old Charybdis was towed to Halifax and returned to the Royal Navy. Such was the fate of Canada's first warship. Is it any wonder that there has never been another ship named Charybdis in the RCN?

With Charybdis went any hope of a Canadian Navy for the next thirty years. Every time anyone was bold enough to suggest a navy, the cry, "Charybdis!" was sufficient to silence him.

It was 1909 before Canada's undefended shores became, once again, a sufficiently strong argument to dull the memory of Charybdis. This was a time when the German Navy showed the first signs of challenging Britain's supremacy of the seas, and trade routes were then, as they are now, of great importance to Canada's economy. It is not surprising that out government became worried, for the signs they saw were to be part of the cause of the bloodiest war yet. The need for a navy was once again brought up in parliament, and the following year it was agreed to form a naval service to work in close liaison with the British Navy.

Thus the birthday of Canada's Navy was 4 May, 1910, for this was the date that the Naval Service Act was given Royal assent that is, became law. One year later by order of the King, it became the Royal Canadian Navy. Meanwhile, great plans were being drawn up for the new service.

Look about you and see the complex organization we have now. Think of the tons of different types of stores that are necessary to keep a small ship seaworthy. Consider. that, when it is necessary, you can write on a piece of paper that you require a small but special type screw, weighing perhaps

1/16 oz.; that you can take this scrap of paper to the appropriate stores, and that in a few minutes you have this screw in your hand. Consider further that this little screw may be the difference between that 1½ ton gun mounting in your ship working or not working, and that this mounting includes perhaps 10,000 such small parts!

Now are you getting some idea of what it means to start a navy from scratch?

But look about you again. Consider that over five million dollars is paid to members of the RCN every month. How many times has your pay been in error? How many times have you gone without a meal?

Perhaps you see now that this business of running a navy is big business, and that starting one is a lifetime job.

The men who were drawing up the plans for the new navy in 1910 knew these things. The knowhow behind it all was a group of Royal Navy officers led by our first Director of the Naval Service, Canadian born Rear Admiral Sir Charles Kingsmill. The object, as one Member of Parliament put it in 1909, was to establish a navy which would be expanded and Canadianized to a point where there might some day be "a Canadian Admiral on the Canadian coast". Little did they realize how soon this was to be the case.

Everyone knows that while Henry Ford dreamed and planned for the day when everyone would own a "horseless carriage", he began by building one of these machines in his workshop. So while the fathers of the RCN planned for a Canadian built fleet of six destroyers and five cruisers, they began humbly by purchasing from the Royal Navy two cruisers named *Rainbow* and *Niobe*. These ships were to be used as training vessels: Niobe on the east coast and Rainbow on the west. In early fall, 1910, they arrived on their respective stations. Recruiting was started for the new FCN, and for a while the future looked bright, but fate was once again to take a hand. To understand what happened, it will be necessary to take a look at Canadian history.

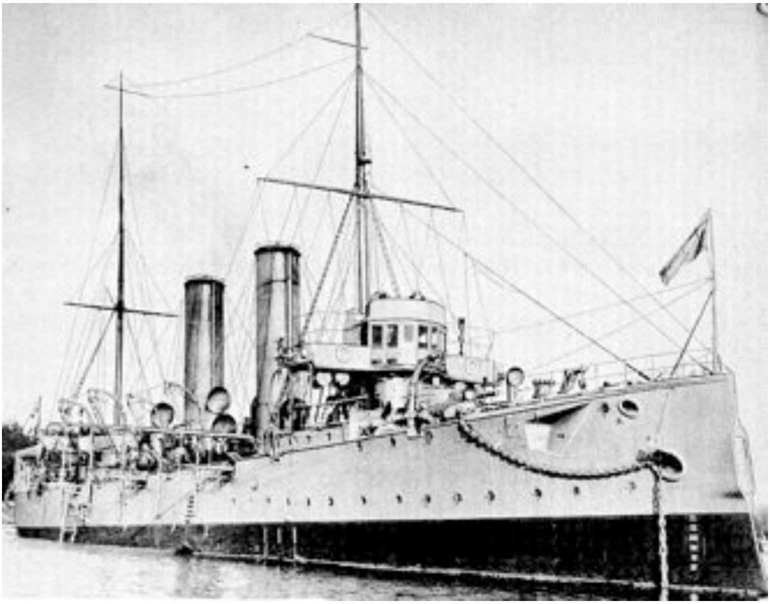


Figure 1-2
HMCS "Rainbow" was built in 1891. She displaced 3600 tons, was 300 feet in length and was capable of 20 knots. Her armament was 2 six inch guns, 4 twelve pounders, and 2 fourteen inch torpedo tubes.

When the act which created the Canadian Navy Service was passed, Sir Wilfrid Laurier was the Prime Minister. There was one body of opinion at that time which felt that Canada need not have her own navy, but, instead, should buy ships for the Royal Navy. There was another group which felt that Canada should not be thinking of a navy at all. Both these groups were thoroughly convinced that they were right and public feeling was stirred up accordingly, so that when a general election came about in 1911, the subject of a navy became one of the major issues.

When Sir Wilfrid Laurier and his government were defeated, Sir Robert Borden became Prime Minister and had rather different views on the subject of a navy. After long talks with the British First Lord of the Admiralty, a gentleman named Winston Churchill, Sir Robert decided that the best thing

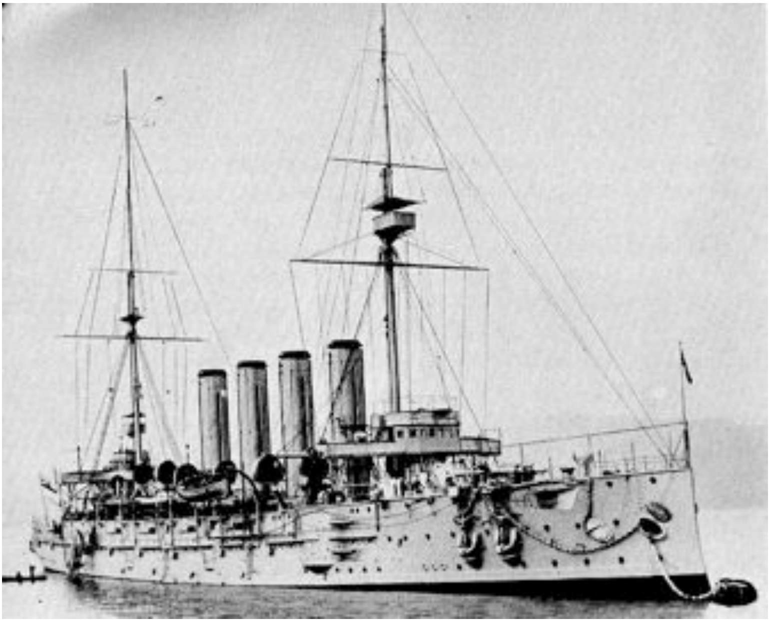


Figure 1-3
HMCS “Niobe” was a heavy cruiser displacing 11,000 tons. She was armed with 16 six inch guns, 12 twelve pounders, and 2 eighteen inch torpedo tubes. Her complement was 700 and she was capable of 20 knots.

Canada could do would be to contribute sufficient money to the Royal Navy to build dreadnoughts (the most modern large battleships of that time).

This proposition caused one of the longest, bitterest and most famous arguments in the House of Commons since Canada had become a nation. It lasted for 23 weeks, and there were times when “the debate became so violent as to occasion apprehension of personal conflict…” The proposal eventually got through the House of Commons only to be defeated in the Senate. However, Sir Robert Borden pursued this business of providing money for the British Navy right up until the outbreak of the Great War (1914 – 1918).

Meanwhile, the new Royal Canadian Navy was neglected. Rainbow and Niobe had been brought from Great Britain by skeleton crews of Royal Navy personnel, and eventually these men had to return home. Recruiting was very slow, and soon there were insufficient men to man the ships.

These were black days for the new navy. Niobe was damaged and almost lost in 1911. Also in that year there were only 126 recruits against 149 desertions. The outcome of it all was that the two cruisers became almost derelicts with skeleton crews of very despondent sailors ... sailors who could see no hope of ever taking their ships to sea.

Then on 4 August, 1914, German troops marched into Belgium. At 1400 the British Government sent an ultimatum to Berlin demanding that Belgian neutrality be observed, and demanding a reply by midnight. There was no reply, and at the stroke of midnight the war telegram which meant, “commence hostilities against Germany,” was sent from Admiralty to ships and establishments under the White Ensign all over the world. Canada’s. two cruisers, such as they were, were immediately placed at the disposal of the Royal Navy.

Figure 14 A Typical Dreadnought

Then a peculiar thing happened. Quite secretly, and with no authority from the Provincial or Federal Government, the Premier of British Columbia purchased two submarines. These boats had been building in Seattle for the Chilean Government, but Chilean navy experts had recommended that they not be accepted. The first hint that they might be for sale had been dropped at a meeting of business men in Victoria. The Premier, Sit Richard McBride, followed up this lead and found that if the boats were to be had they must be bought at once. There wasn't time for advice to come from Ottawa. So he simply wrote a cheque for $1,150,000 on provincial funds.

It was necessary that the transaction take place secretly because the United States was still a neutral country, so on the night of Britain's declaration of war, the submarines were sailed into Canadian waters and the million dollar cheque changed hands. British Columbia became the first and only province of Canada ever to have its own navy. A few days

Figure 1-5
Submarine CC2 displaced 313 tons and was 151 feet in length. She had 3 eighteen inch torpedo tubes. CCI was smaller, but had 5 eighteen inch tubes..

later the Canadian Navy took over the boats, and they gave good service for the first three years of the war.

Canada's contribution to the Navy side of the war effort was small. *Rainbow* lasted until 1917 and did some useful patrol work on the west coast; Niobe lasted only a year and then became a depot ship in Halifax. A number of smaller ships which were bought and built for the RCN were employed in antisubmarine work in coastal waters, but most of the resources Canada could muster went into her Army.

The strength of the RCN rose from 350 to 1000, and the Reserve, known as the Royal Naval Canadian Volunteer Reserve recruited some 8,000 men. (The RNCVR should not be confused with the RCNVR organized in 1923). Also a fairly large but unknown number of Canadians enrolled in the Royal Navy. The total deaths from all causes in the Canadian Navy amounted to 150.

One good thing, however, did come out of the war. The idea of a Canadian Navy was here to stay, and in spite of the hard times to come, it was not forgotten. Nevertheless, Parliament found it difficult to decide what form the navy should take. In the end, naval policy formed itself as best it could, and the result was fairly consistent right up until the outbreak of the Second World War. It was in this period after the Great War that the RCN became a small ship navy, and that is what it has been, more or less, ever since.

Shortly after the Great War the Royal Navy made a gift of two almost new submarines to the Canadian Navy. Then in 1920 the Canadian Government asked Admiralty for two destroyers and one light cruiser. These were received. The destroyers were *Patriot* and *Patrician*, and the cruiser was *Aurora*. But once again, in 1921, a change of governments dealt the RCN a body blow.

At about this time, the whole world was sick of war. Most countries, including the United States and Great Britain, were scrapping large numbers of warships, trusting the League of Nations to keep the peace, just as we, to a lesser extent,

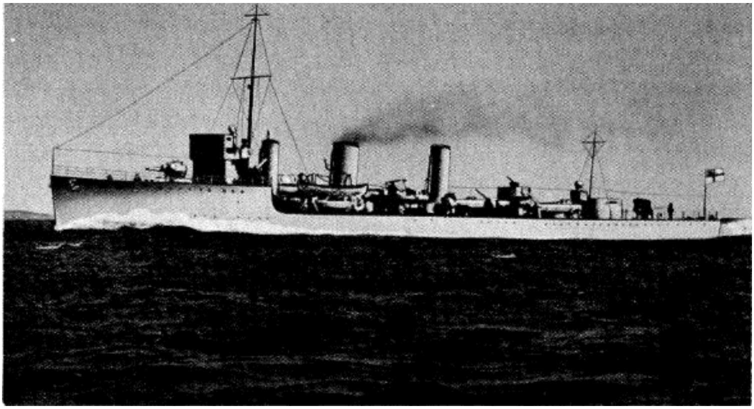


Figure 1-6 The "Patrician"

place our faith in the United Nations. Thus when the government which had served during the war was defeated and the new one came to power, it was decided to do away with all but the two destroyers.

From this time until 1939 Canada had nothing but destroyers. This was rather more than the whim of a government, however. It was sound reasoning. With only one type of ship, training was greatly simplified. Besides, the destroyer was the type of ship best suited to Canadian needs. It could well defend our complicated coastline, or join a fleet unit of the British Navy if it were necessary.

Patrician and *Patriot* lasted until 1927 when they were replaced by two more British destroyers renamed *Champlain* and *Vancouver*. Then in 1931, the Canadian Government had two destroyers specially built for the RCN. They were *Saguenay* and *Skeena*. In 1937 two more British destroyers replaced *Vancouver* and *Champlain*. These were renamed *Fraser* and *St. Laurent*. Then in 1938 two additional destroyers were purchased. These were renamed *Restigouche* and *Ottawa*.

In 1939 four minesweepers of the *Basset* class were built and commissioned as *Fundy*, *Gaspé*, *Comox*, and *Nootka*.

Further, a training schooner, *Venture*, had been commissioned and stationed in Halifax.

This was the shape of things in 1939: six destroyers, four minesweepers, one auxiliary schooner, and two other smaller vessels.

Canada declared war on Germany on 10 September, 1939.

There were many reasons for this action, and not least among them was the fact that 63 percent of our export trade and 39 percent of our import trade was moved by sea. In others words, the oceans and seas of the world had to be friendly or else the machinery of Canada would come to a halt.

There had been some preparation for this war. Two weeks before Canada officially declared war, the Director of Naval Intelligence in Ottawa, received a telegram from Admiralty. It said one word, “FUNNEL,” and immediately all British merchant vessels and those of Commonwealth countries came under the control of their respective navies.

The panic had begun. What ships were going where? What was their cargo? When would they arrive? Who was ready to sail? Suddenly Ottawa became the most important control centre in the world, and suddenly, the Royal Canadian Navy came into its own.

The RCN entered the Second World War with thirteen ships and a good deal of spirit. It ended that war with mine hundred ships and even more spirit!

In the latter part of the Great War (1914 - 1918) when German submarines began to venture out into the Atlantic for their prey, convoys became a necessity. The idea behind the convoy system is that it is easier to route and defend a group of vessels of about the same speed if they stay together than if they proceed independently.

Suppose there are 400 merchant vessels which are to cross the Atlantic in a month, and suppose there is one enemy submarine waiting in the middle of the ocean. There are 20 escorts available to defend the merchant ships. If all of the merchantmen were to proceed independently, most of them would have

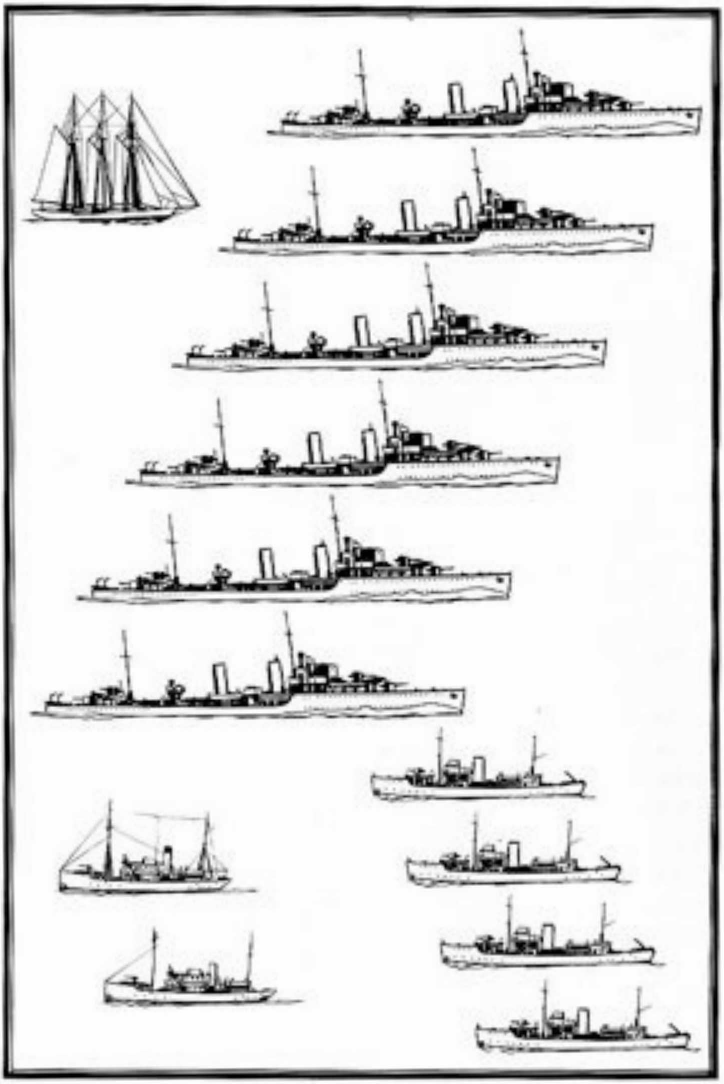


Figure 1-7 The RCN in 1939

Figure 1-8 Convoy in Bedford Basin, Halifax.

to go undefended. Routing them to avoid the submarine would be a mammoth task. However, if they go in convoys of 80, each convoy can be defended by 4 escorts, routing is simplified, and the submarine certainly has a harder time finding 5 units in an ocean than it does finding 400.

It became quite apparent that the Germans were going to pursue an unrestricted submarine policy when, less than 24 hours after war had been declared, a British passenger liner, SS *Athenia* was torpedoed in the Atlantic west of Ireland. Thus on 7 September, 1939, the RCN received word the "Admiralty intends that convoys should be started from Halifax as soon as possible." On 16 September, the first convoy, HX-1, sailed from Halifax guarded in part by the destroyers *St. Laurent* and *Saguenay*. This was the first of 359 such convoys which sailed from Halifax over the next six years. There were many other types of convoys besides the HX variety crossing the Atlantic during the 2,060 days of war. Over 25,000 merchant ship voyages were made from North

American ports to the United Kingdom, and they carried some 90,000 tons of war supplies a day to the battlefields of Europe.

It is plain to see that the first problem facing the Chief of Naval Staff was to obtain more and more ships. There were three ways of getting ships. One was to buy new or used vessels from the Royal Navy; another was to build new ships in Canada, and the third was to requisition privately owned ships in Canada.

But what type of ship was needed? The war at sea split into three phases. For the first two years the main concern was to protect our east coast and Newfoundland from raiders, submarines and mines. The ships required would be combined antisubmarine and minesweeping vessels, and destroyers. In the middle years, convoys became the most important concern, and the ships required were antisubmarine frigates and escort destroyers. During the final years ships were required for offensive work both in the Atlantic and in the Pacific against Japan. Thus we needed destroyers, cruisers, and aircraft carriers.

Of course, the Chief of Naval Staff could not accurately forecast the future, so he had to get what he needed at the moment, and, briefly, here is what he did.

Building a ship takes time. It was quickly realized that a year would go by before any ships could be produced by Canadian shipyards, so the Government began to requisition privately owned vessels, Literally hundreds of these ships were obtained ranging from private yachts to hydrographic survey vessels. Some were bought outright, some were requisitioned for the duration of the war, and others were chartered.

Meanwhile shipbuilding commenced in Canada on a large scale. For example, by the end of 1941, 68 corvettes, 26 Bangor class minesweepers, and 13 Fairmile type motor launches were completed and were in commission in the RCN. These figures are the more amazing when you consider that none of the firms had had much experience with warships. In

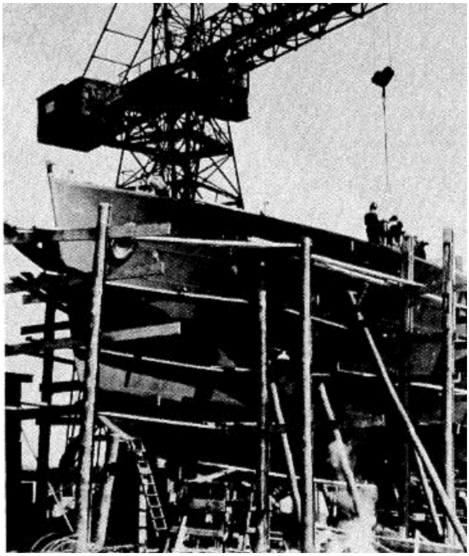


Figure 1-9 Corvette Under Construction

fact only a few had actually built a warship before, and these had built nothing larger than a small minesweeper.

By the end of the war, Canadian shipyards had built for the RCN:

- 12 Algerine class minesweepers
- 80 Fairmile type motor launches
- 10 wooden minesweepers
- 54 Bangor class minesweepers
- 106 corvettes
- 60 frigates
- 2 Fairmile depot ships

This makes a total of over 270,000 tons of warship construction over the six year period of war. In addition to this, there we many warships built for the Royal Navy during this period, and 403 merchant vessels totaling almost 4,000,000 tons were built for Canadian and foreign use. It is all very well to have many ships. The problems of designing and building them are left to the civilian technicians and dockyard "maties." But there must also be men to man the ships, and these personnel must have some training before going to sea. The average sailor becomes so familiar with his ship that he tends to forget that, to the outsider, it is an extremely complicated device.

Before the Second World War and dating back many hundreds of years, to be a sailor it was sufficient to have a sound body. However, with the advent of the Second World War, technical advances were rapid, and soon it was necessary for the sailor to be not only a seaman, but also, in a small way, a technician. This meant that not only a sound body was required, but also a fairly sound mind and some education. Recruiting, selection, and training came to be big businesses in themselves.

At the beginning of the war there were a few over 2,500 personnel in the RCN and its Reserves. By the end of the war almost 100,000 men and 6,000 women had joined the service. This is as many people as there are in a fair-sized city.

The ports of Halifax and Esquimalt mushroomed, and it was soon necessary to move the bulk of the training away from the operational areas. That is how HMCS CORNWALLIS came to be on the opposite side of Nova Scotia from Halifax. Thus, the RCN came of age.

Besides making the Navy a recognized fact and a necessity for the people of Canada, the Second World War established a fighting tradition that will be part of the RCN as long as it exists. It is well that every Canadian sailor know just what standards he is expected to live up to, so it is well that he have some idea of the past achievements of his service.

Without a doubt the greatest battle the RCN has fought was the *Battle of the Atlantic*. This was a fight to the death against a highly skilled and unscrupulous enemy. It involved tens of thousands of ships and hundreds of thousands of men. The Battle of the Atlantic was fought from September, 1939 to May, 1945.

This was the battle for supremacy of the Atlantic Ocean. After the fall of France, the British Isles were hemmed in on three sides by forces of the enemy. An invasion of Britain seemed imminent, and could be warded off only by a continuous supply of necessary food and munitions. With the attack on Russia it became apparent that if the allied nations were to

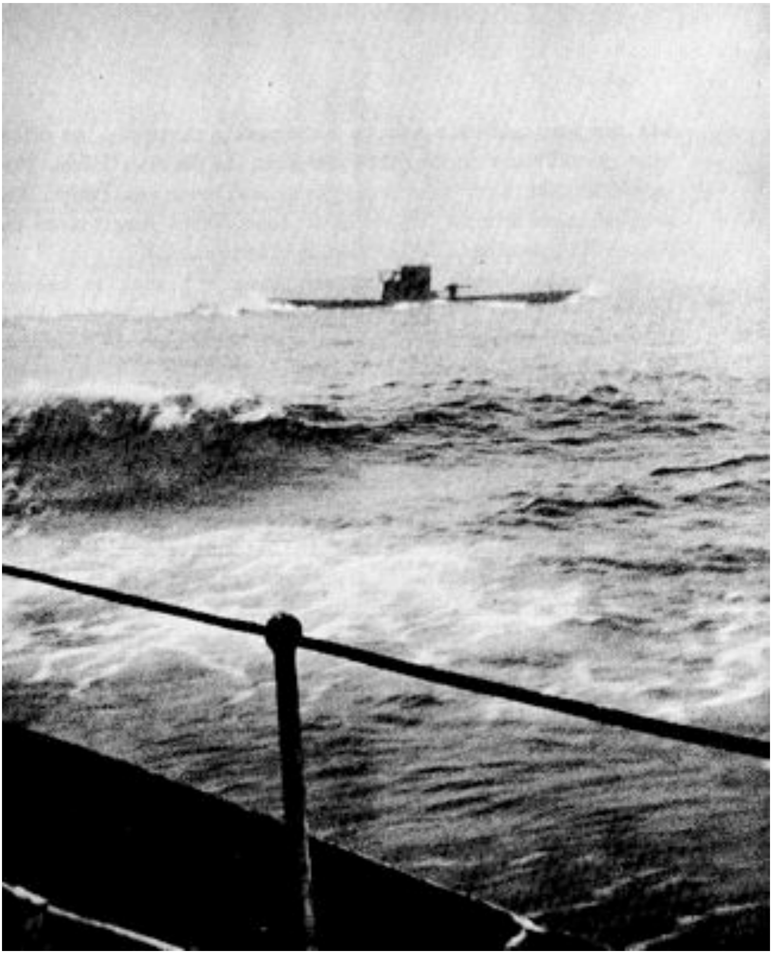


Figure 1-10

U210 Just Before Being Rammed by
HMCS “Assiniboine”
in August 1942

win the war, and this was by no means a certainty, an offensive would have to be launched from the British Isles. This would require more men, more food, and more equipment. The supply lines across the Atlantic from North America to the United Kingdom became increasingly important.

Meanwhile, German submarines were beginning to operate farther and farther into the Atlantic, and, by the spring of 1941, they could be expected anywhere from the English Channel to the approaches to Halifax. It was now that the most intense phase of the Battle of the Atlantic began. Adolph Hitler made no idle threat when he remarked, "Wherever British ships cruise, we shall set upon them our submarines until the hour of decision."

Convoys were sailing as frequently as possible, and the numbers of ships sunk was increasing with horrible rapidity. It is interesting to examine the progress of one of these convoys which sailed at the height of the battle.

Convoy SC 42 consisting of 64 ships sailed from Sydney N.S. on 30 August, 1941, carrying over a half million tons of supplies for the United Kingdom. Her escort was the destroyer *Skeena*, and three corvettes, *Orillia*, *Kenogami*, and *Alberni*. The route was to the north, around the tip of Greenland, then around the top of Ireland and into the United Kingdom.

For six days the passage was uneventful, even tedious. Then on the seventh a great number of German radio transmissions were picked up. It could only be U-boats, gathering strength, preparing for the attack.

The convoy altered course to the north in order to run along the Greenland coast and perhaps throw off the enemy, but in vain. At dusk, the first merchant vessel was torpedoed and sank quickly.

Within a few minutes four U-boats had been sighted, one of which was running down the columns of the convoy. Then another merchant vessel was hit, and a few minutes later the evening sky was illuminated by an enormous bonfire which had been a tanker.

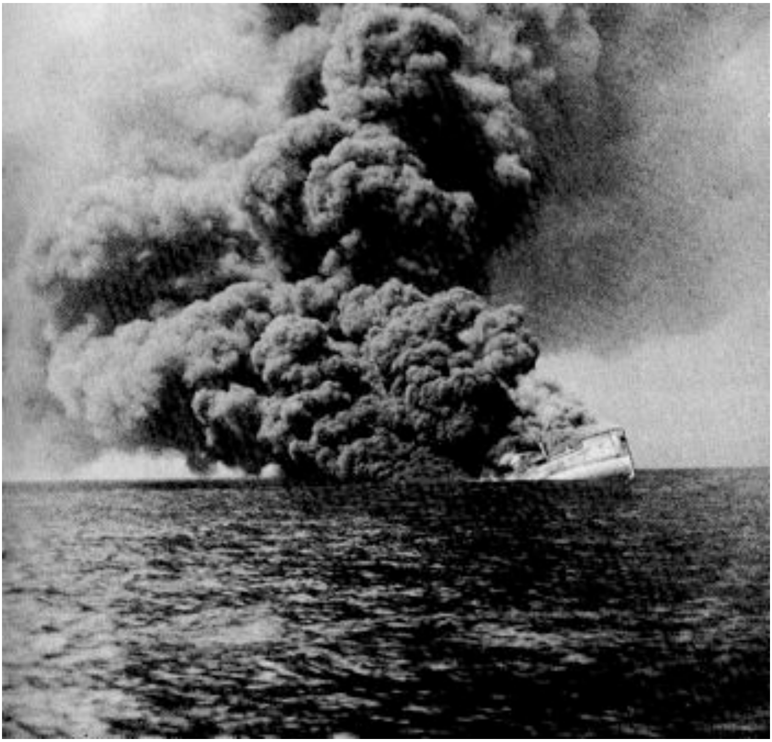


Figure 1-11 Torpedoed Merchant Vessel

Evidence showed that there were at least eight U-boats, but the odds of two to one were increased by the fact that the escorts were needed not only to defend the convoy, but also to pickup survivors from the sinking ships. It was not feasible.

for a merchant vessel to disrupt the form of the convoy and risk a torpedo by stopping for survivors.

Until midnight a bright moon silhouetted the targets, and seven merchant vessels went to the bottom. The destroyer and corvettes worked feverishly in an attempt to ward off the attack, but the odds were hopeless. In addition to its other duties, one corvette was trying desperately to salvage a tanker which had been hit but was still afloat. Eventually these two ships set off for Ireland and this left three escorts.

At about midnight a cloudbank obscured the moon, and taking advantage of the darkness, the convoy turned away. But shortly afterward another ship erupted in a tower of flame. The battle went on this way until morning when the U-boats drew off for a short time.

At noon another merchant ship was torpedoed, but this time *Skeena* sighted the periscope. She attacked immediately, accompanied by the other two escorts, and eventually they registered a probable kill.

That night the U-boats reopened the attack in full force. But reinforcements were on the way. By sheer good fortune two other corvettes were training south of Greenland, and they were despatched to relieve the crippled convoy. As they approached they made contact with a submarine. They attacked, and were about to make another run when the vessel surfaced, surrendered, and scuttled itself. One Canadian was lost in an attempt to salvage the boat.

During the course of the night eight further merchant ships were sunk and others damaged. The battle raged until noon the following day when more escorts arrived, and the U-boats retired to look for another unfortunate convoy.

The total score was fifteen merchant vessels sunk against one U-boat probably sunk, and one more sunk by a rare piece of good luck. One further merchant ship was sunk before the convoy reached the United Kingdom.

Take this action, which was fairly typical during the height of the Battle of Atlantic, multiply it by a hundred or so, and

Figure 1-12 After a Winter Convoy

set it, half the time, in some of the roughest, coldest, most miserable weather in the world and you will then have a vague idea of what it was like to participate in the Battle of the Atlantic.

Tomorrow, any day, we may be forced to go to war, and when we do Canadian sailors will be expected to live up to the remarkable standards set by our countrymen who fought the Battle of the Atlantic.

As the war progressed, aircraft and aircraft carriers began to play an ever-increasingly important part. Before Canada acquired her first carrier many Canadians served with the Royal Navy Fleet Air Arm. It is worthy of note that the only Victoria Cross awarded to a member of the RCN during this war was won by Lieutenant Robert Hampton Gray, VC, DSC, RCN, while serving in the Aircraft Carrier *HMS FORMIDABLE*. The VC was awarded posthumously to Lieutenant Gray after he lost his life in a heroic and successful air attack against an enemy destroyer in a Japanese harbour. You should read the account of this daring deed. You can find it in The Far Distant Ships listed in Appendix I.

May, 1945, saw the end of the war in Europe, and, before the RCN could put into action all of its plans for fighting the Japanese, the atom bomb had been dropped on Hiroshima and the war was over. Demobilization of ships and men was in full swing by the end of the year. The final peacetime navy which formed the nucleus upon which we are still building was less than 10,000 men, one aircraft carrier, two cruisers, and a few modern destroyers, frigates and auxiliary craft.

During the Korean War, 1950 to 1954, RCN destroyers took a very active part in patrol duties, shore bombardment, etc. Partly as a result of the Korean War the size of the RCN was raised to about 21,000 personnel.

The next chapter in the epic story of the RCN is still being written. It is highlighted by the designing and building in Canada of new ships specifically for Canadian use ... but more of this later in the book.

Whether or not the RCN lives up to its heritage depends on the Canadian sailors who are joining and serving now. Every Canadian sailor has a chance of being one of the heroes of the next chapter, but whether or not he is, it is his duty to carry the story a little further toward the goal of universal peace when Canada will no longer require a fighting navy.

Quiz

1. What is the birthday of the RCN?
2. Why were *Rainbow* and *Niobe* bought?
3. Which is the only province in Canada ever to have had its own navy, and how did it happen? When?
4. What good thing for the RCN came out of the Great War (1914–1918)?
5. Why were Aurora and two submarines sold in 1921? What form did the RCN then take?
6. What was one very important reason for Canada declaring war on September 10, 1939?
7. What is the theory behind the convoy system of routing ships in wartime?
8. What was the most important problem facing the Chief of Naval Staff after war was declared in 1939?
9. Why are the figures of Canada's warship building between 1939 and 1945 so amazing?
10. How did HMCS *Cornwallis* come to be built so far from Halifax?

CHAPTER 2

CUSTOMS AND TRADITIONS

Why Do We Have Them?

The customs and traditions of the Royal Canadian Navy are closely connected to those of the Royal Navy. Chapter 1 has shown how, in the beginning, the Canadian Navy was founded by officers and men with experience in the British Navy. It was only logical that they should fashion the new navy on the tried and proven lines of the old one.

As far back as 1911 it was realized that conditions in the Canadian Navy would have to be unusually good if enough recruits were to be obtained. Pay had to be higher than that of the Royal Navy, and living conditions had to be better. Thus a process of "*Canadianization*" was undertaken and is still going on today. The Royal Canadian Navy is becoming more and more distinctively Canadian in many ways, yet, there are a great number of customs and traditions which have been inherited and which are not likely to die out no matter what form our navy should eventually take. It is these usages with which this chapter is primarily concerned.

But first, what is the use of having customs and traditions? What is the point, for example, in saluting the quarterdeck?

In baseball, the supporters of each of the teams stand up in the traditional "seventh inning stretch". In football, cheering sections complete with cheer leaders chant traditional cheers for their favourite teams.

Why?

It is because people are proud to be supporters of one particular team or another, and they don't care who knows it; in fact they are generally happy to have others know it.

In the Navy, certain customs and traditions are perpetuated because men are proud to be sailors, proud to be members of the Royal Canadian Navy, and proud to be different from everyone else. Sailors, too, are happy to have others know they are members of the service, because to be a sailor is to be a man.

Again, many of the customs are useful. A ship is a very special type of living place compared with a house. Therefore, the parts of a ship must have different names from their shore equivalent if they are to show exactly what they mean. Ordinary folk work all day and sleep all night, but a ship cannot stop just because the sun is down. Therefore, the sailor's day must be divided into watches and there must be a special way of telling the time.

Thus naval customs and traditions may be classified in two ways. There are the proud customs, and the useful ones. Indeed many of our customs and traditions are both proud and useful.

What's In a Name?

The names of the various jobs in the ship are one of our oldest traditions. In the eleventh century a group of picked men were stationed in the mouth of the River Thames and on the south coast of England. This group was known as the "Buscarles," and was employed to fight the King's ships. ("To fight a ship" means to fight a battle in and with a ship). These vessels were each under a "batsuen" or "husband" who acted at all times as master, pilot, or steersman. Hence modern ships have a "boatswain" who is generally the most experienced practical seaman in the ship. In the merchant service today, the man who is responsible for outfitting the ship is called the Ship's Husband.

At about the same time there existed a vessel known as a "Cog," and the officer in charge was known as the "Cogswain." Thus there is a coxswain today who is the senior chief petty officer of the ship, and who is responsible for discipline and routine.

Sailors' Colours

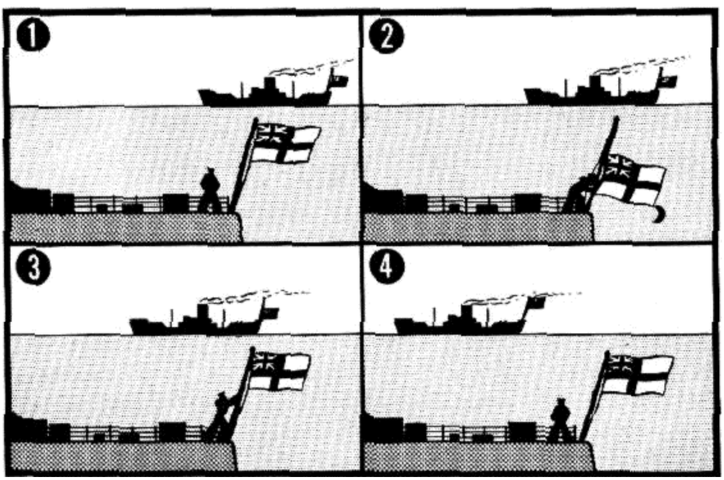
It was many hundreds of years ago that blue became the colour of seamen's dress. Edward the Confessor, who reigned over England in the first half of the eleventh century, is said to have dressed his oarsmen in a rough woolen cloth dyed blue. The colour goes back even further, however, for in 55 A.D. a class of boat run by the Counts of the Saxon Shore camouflaged itself with blue sails and blue dress for the oarsmen. Blue and white were officially ordered as the naval colours by King George Il in 1748. He had seen the Duchess of Bedford wearing these colours and had been so attracted by her that he ordered them for sailors straight away!

Salutes

Salutes are as old as history. Ship salutes in the days of sail were made by striking topsails, letting fly sheets, and firing all guns. The object of this exercise was to prove the friendly nature of the saluting ship. Striking topsails and letting fly sheets placed a ship in an extremely disadvantageous maneuvering position; firing all guns meant that a ship was virtually undefended because it took a good deal of time to reload. Salutes are still fired but blank cartridges are used because of the danger from projectiles fired from modern guns. This is said to have started when a ship in the Thames fired a salute which narrowly missed Greenwich Palace where Queen Elizabeth I, then a princess, was in residence.

At present, ceremonial salutes are fired only by ships with special saluting guns, and then only between 0800 and sunset. The 21 gun salute is the most important, and is used to honour members of the Royal Family on the occasions of their coming on board or on their various anniversaries. This salute is also used as a national salute to honour the flags of foreign countries.

Salutes of less than 21 guns are always an odd number of guns and are used chiefly as personal salutes for service or civilian dignitaries. These range from 19 guns for the Admiral of the Fleet to 7 guns for the Commanding Officer of a private ship. A “private ship” is one commanded by a Commodore or below. The 7 gun salute is only fired in reply to a salute, never as an initial salute. Merchant vessels salute warships by dipping their ensigns. A warship in reply dips her ensign, rehoists it, and finally the merchant vessel rehoists hers.



If, in harbour, you notice a merchant vessel dip and there is no one manning your Ensign, you should do so immediately. When a ship has extended the courtesy of a salute, it would certainly be unmannerly not to reply.

Figure 2-1

In olden days British men of war used to enforce courtesy by gun action if necessary, and it is interesting to note that this insistence on saluting led to the Dutch War in 1652. At present, however, merchant vessels are not required by law to salute warships.

The hand salute was instituted by Queen Victoria in 1890.

Before that time it had been customary to doff headgear when speaking to a senior person. This custom is perpetuated in a number of instances in the service including defaulters, Captain's inspection, morning prayers and so on.

The origin of the hand salute is not clear. It is thought that it began as a token of friendly intent in the same way as the gun salute. When two men wearing armour met, they would open the visors in their headgear, thus laying themselves open for attack. The hand was kept open showing that there was no weapon concealed in it.

Nowadays, the salute is made in the following manner: the open right hand is raised smartly but naturally to just above the right eyebrow. The tips of the fingers should be in line with the nose. The palm should be inclined slightly towards the face so if you glance up you will be able to see the inside of the palm. The hand, wrist, and forearm form a straight line, and the thumb should be in line with the fingers.

If you raise your arm naturally, you will find that your arm will go the shortest way from the side to the forehead. Practice this position before a mirror. A good salute will make a good impression and that is half the battle won.

The timing for the salute is quite simple. When halted the time for remaining at the salute is equal to two marching paces. Count to yourself, "Up-two-three-down". When on the march the salute is to be made at least three paces before meeting the officer if he is halted. If the officer being saluted is also on the march towards you the salute is to be made at least six paces before reaching him.

When you are saluting to the left or to the right, you must turn your head and look straight into the face of the officer being saluted. When saluting to the right it will be necessary to bend the elbow back a little.

All commissioned officers and chaplains are saluted whether they are army, navy, or air force. All members of the Royal Family are saluted. Any officers in plain clothes are to be saluted if you recognize them, and you should recognize all officers from your own ship.

When the Canadian or any foreign national anthem is played, you should face in the direction of the music and salute. Similarly, while Colours are being hoisted in the morning and lowered at sunset, you face the Ensign and salute if not fallen in.

Figure 22 Hand Salute

A salute is made when coming on board or leaving the ship or coming on to the quarterdeck. The origin of this custom is not known for certain. Some historians have it that the quarterdeck was saluted because the Sacrament or Crucifix was kept there. Others say that it was because this was the place of authority and the position nearest the King's Colours.

There are some useful hints about saluting which, if you kept them in mind, will keep you out of trouble.

1. Unless you are reporting to an officer wearing his cap, do not salute indoors or between decks.
2. If you are fallen in, do not salute unless you are ordered to do so.
3. If you are ever in doubt about whether or not to salute, do so. Nothing is lost by it, but there may be a good deal lost if you do not.

The Boatswain's Call

The boatswain's call dates back to the days when Greece and Rome used galley slaves. In the early days of the Royal Navy it was a badge of rank as well as the means of passing an order. The Lord High Admiral wore a golden "whistle of honour" from a chain around his neck, and he also carried a "whistle of command" which he used for passing orders and for saluting certain people.

In modern times the boatswain's call is still used as a badge of rank. Quartermasters wear them on silver chains instead of their lanyards.

In the olden days, captains of ships were often called on board the flagship when at sea. When it was too rough to use sea gangways, the Captain would be hoisted out of his boat in a boatswain's chair on a yardarm whip, and the orders for this were passed on the boatswain's call. Now the pipe meaning "hoist and walk away" is still made when the Captain of a ship comes aboard, although now it has become a form of salute. This is known as "*piping the side*", and it is a salute used only for naval officers.

Two notes and a variety of tones are used when piping. To get the low note, straighten out the fingers and blow steadily into the mouth of the gun. (Figure 2-3) To get the high note, obstruct the exit of air from the hole by curving the fingers around it and once again blow steadily into the mouth of the gun.

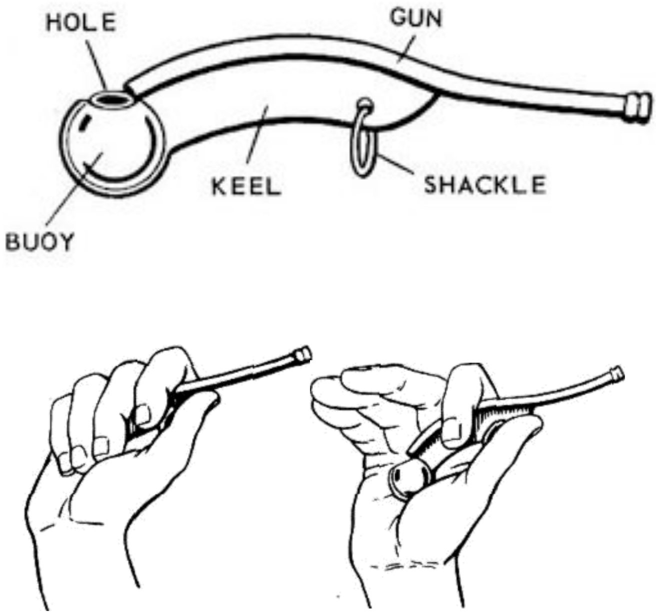


Figure 2-3 The Boatswain’s call

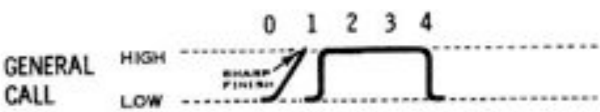


Figure 2–4

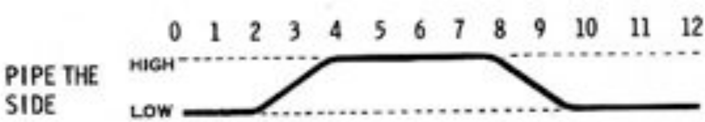


Figure 2-5

The main pipe is the general call which is produced in the manner shown in Figure 2-4. The general call is used to get the attention of the ship's company before repeating an order.

The side is piped in the manner shown in Figure 2-5.

When the boatswain's call is heard in a ship, it means that an order is being passed or is about to be passed. In any case you should give it your immediate attention.

Naval Time and Watches

In a ship, the day is divided into watches, and the watches are divided into half hour periods. At the end of each half hour period the ship's bell is struck.

The 24 hour clock is used instead of the usual 12 hour variety. That is to say, for the sailor 1 P.M. is 1300, 2 P.M. is 1400 and so on. For example, if you wish to say that your ship is sailing at 3 P.M., you would say, "My ship is sailing at fifteen hundred" not "fifteen hundred hours." Watches are as follows:

0000 to 0400 middle watch
0400 to 0800 morning watch
0800 to 1200 forenoon watch
1200 to 1600 afternoon watch
1600 to 1800 first dog watch
1800 to 2000 last dog watch
2000 to 0000 first watch.

If 1600 to 2000 were all one watch, and if a ship's company were in two watches, it is easily seen that each watch would be standing the same times each day. Therefore, this time is split into two watches called the dog watches.

Each of the 4 hour watches begins and ends with 8 bells. At the end of the first half hour of the watch 1 bell is struck; at the end of the second half hour 2 bells; the third half hour, 3 bells, and so on until at the end of the eighth half hour, or the end of the watch, 8 bells are struck.

The custom of striking the ship's bell to mark the time dates back to the thirteenth century when "half hour glasses" (similar to large kitchen egg timers) were in use.

Each time the glass was turned a bell was struck, starting with 1 bell for the first turn and ending with 8 bells for the last.

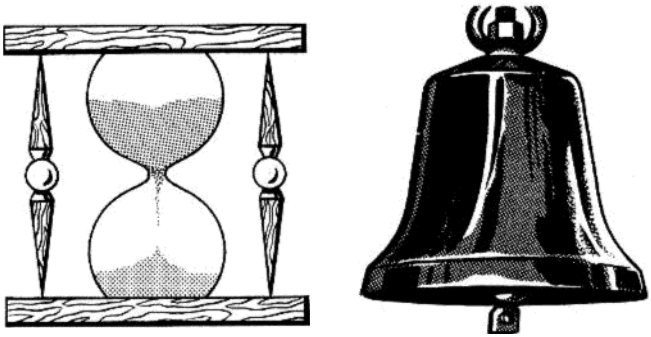


Figure 2-6

It is easy to see that the first dog watch ends with 4 bells. But at 1830, instead of 5 bells there is 1 bell, and then the last dog watch ends not with 4 bells but 8 bells. This practice is said to have started in the year 1797 after the Mutiny of the Nore. The signal for the mutiny was to be 5 bells in the dog watches, but an officer heard of this and had only one bell struck at 1830. Although the mutiny broke out as scheduled the custom remains to this day.

Bells are struck in twos; that is, 5 bells will be "ding-ding", pause, "ding-ding", pause, "ding-ding". This is done to make it easier to count the number.

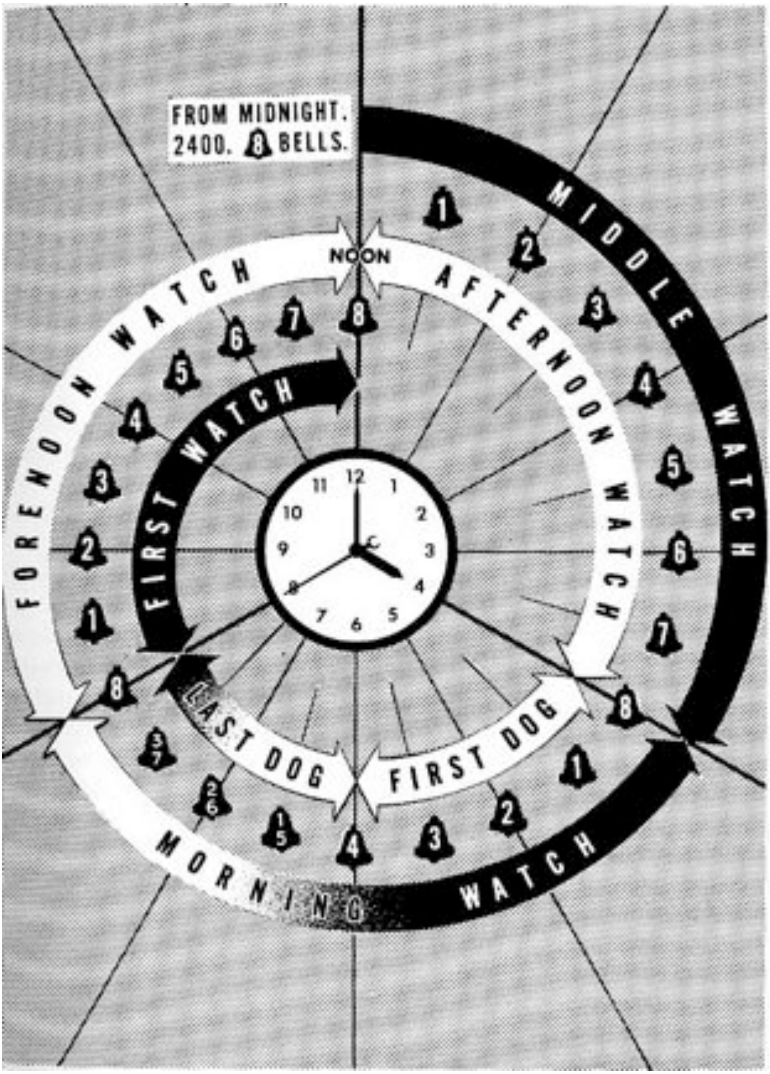


Figure 2-7 Naval Time

Uniforms

The proudest of naval traditions is that of uniform. The present naval uniform developed over many years from very humble beginnings. Around 1759, the unofficial uniform was described as “a little low cocked hat, pea jacket, canvas petticoat trousers not unlike a kilt, tight stockings, and shoes with pinchbeck buckles”. There being no official rig at this time, captains of ships used to dress their men in any rig they fancied. One captain even went so far as to dress his boat’s crews in the multi-coloured costume of clowns.

It was probably to put a stop to this fancy dress that the uniform was standardized in 1857. Since that time it has changed very little.

Caps evolved from the cocked hat to the low cut tarpaulin hat, and from that to the straw hat. Near the beginning of the twentieth century the cap as we know it was authorized, although at that time it still resembled the present WRCNS cap.

Pigtails were the style for a period in the eighteenth and nineteenth centuries, and it is said that the collar was introduced to protect the jacket from the tallow or tar used as a dressing on the pigtails. The three rows of white tape were not introduced to commemorate Lord Nelson’s three victories as has been popularly supposed. Some have it that they were intended to distinguish the authorized collar from the non-service rig. Others say that there should have been two rows but that a mistake was made when drawing up the pattern.

The silk, or scarf, has been used since early times around the head as a sweat band for gunners. It had other uses as well, but when it was not in use it was worn around the neck tied loosely at the front in the same way as a cowboy kerchief. Silks used to be of any colour the brighter the better but black was eventually authorized, probably because it did not show soiling as quickly as lighter colours.

The lanyard was used to hang a knife in front of the seaman’s body when he was working at rigging. The length was

Figure 2-8 Rig of the Day

variable, depending on the length of the arms of the wearer. The lanyard is worn under the collar so that if it is caught the running Turk's head will not slip up and strangle the wearer.

The seaman's knife is made blunt-ended for many reasons, not least among which is to make it a poor stabbing instrument.

Superstitions

Besides the customs and traditions, there have been a great number of superstitions among sailors. Some of these are half believed to this day.

Sailing on Friday or on the 13th has been commonly thought to bring bad luck. There are many tales of ships that were wrecked or disappeared as a result of sailing on these dates.

It is still customary to stick a knife into the mainmast to bring wind, the direction of the handle being the desired direction of the wind. Whistling is also said to bring wind, and it is still discouraged in naval ships. This is probably more because it may be confused with a boatswain's call than from a fear of wind.

If a glass is allowed to ring, it is suppose to sound the death knell of a sailor who will die of drowning, but if it is stopped by putting fingers on the glass, "The devil will take two soldiers in lieu.

Prayers

The saying of prayers in ships is a very old custom. In the seventeenth century, hymns and psalms were sung on changing watches, and prayers were said before going into battle. QRCN requires that divine Services be held in all HMC ships and establishments.

Every sailor should know by heart his naval prayer and the Sailor's Psalm:

A NAVAL PRAYER (Protestant)

"0 Eternal Lord God, who alone spreadest out the heavens and rulest the raging of the sea; who has compassed the waters with bounds until day and night come to an end; be pleased to receive into Thy Almighty and most Gracious Protection the persons of us, Thy servants, and the Fleet in which we serve. Preserve us from the dangers of the sea, and from the violence of the enemy, that we may be a safeguard unto our most gracious Sovereign Lady, Queen Elizabeth, and her Dominions, and a security for such as pass on the seas upon their lawful occasions; that the inhabitants of our Empire may in peace and quietness serve Thee our God; and that we may return in safety to enjoy the blessings of the land, with the fruits of our labours, and with a thankful remembrance of Thy mercies to praise and glorify Thy Holy Name, through Jesus Christ our Lord, Amen."

PRAYER FOR THOSE AT SEA (Roman Catholic)

"0 God, who didst bring our fathers through the Red Sea; and carry them in safety through the overflowing waters, singing praises to Thy Holy Name, we humbly beseech Thee that Thou wouldst preserve Thy servants journeying by sea from all dangers, granting them a tranquil course and the wished for haven."
Amen

THE SAILOR'S PSALM

They that go down to the sea in ships and occupy their business in great waters; these men see the works of the Lord and His wonders in the deep. For at His word the stormy wind ariseth which lifteth up the waves thereof. They are carried up to heaven and down again to the deep; their soul melteth away because of the trouble. They reel to and fro, and stagger like a drunken man, and are at their wits' end.

So when they cry unto the Lord in their trouble, He delivereth them out of their distress. For He maketh the storm to cease so that the waves thereof are still. Then are they glad because they are at rest; and so He bringeth them unto the haven where they would be.

Psalm 107, verses 23 to 30

QUI Z

1. What are two reasons for having customs and traditions in the service?
2. Between what times are ceremonial salutes fired?
3. What is the sequence of events when a merchant ship pays a mark of respect to a naval vessel?
4. What are four occasions when you should salute?
5. What are two occasions when you should not salute?
6. What is the pipe you will most often hear in a ship?
7. Why is the time between 1600 and 2000 not all one watch?
8. What is the story behind the striking of one bell at 1830?
9. What was the silk originally used for, and why is it black?

The answers to these questions may be found in Chapter 2. When you can answer all of these questions perfectly, you may consider yourself to have a fair grasp of this chapter.

CHAPTER 3

DISCIPLINE AND ORGANIZATION

Discipline

John Paul Jones ranks high in the sailor's hall of fame. He was a great United States Naval Officer who fought in the American War of Independence. In a letter he wrote to the United States Congress he made the following statement which will be explained later:

". . True as may be the political principles for which we now contend (the fight for independence) they can never be perfectly applied or even admitted on board ship. This may seem a hardship, but it is nevertheless the simplest of truths. While the ships sent forth by Congress may and must fight for the principles of human rights and republican freedom, the ships themselves must be ruled and commanded at sea under a system of absolute despotism."

What did he mean?

Simply this: there is no room for democracy in a ship, no matter how democratic the country which the ship is serving. Let us take a simple example.

It is wartime, and a submarine is sailing on the surface. The Captain is on the bridge. Suddenly he sees an aircraft come over the horizon.

Now if this were a democratically run vessel, the Captain would then turn to the lookout and say, “That aircraft do you think it might be an enemy one?”

The lookout would say, “It might be, sir.”

The Captain would then go to the voicepipe and say, “Would you please tell the ship’s company that the lookout and I have seen an aircraft which we think might be an enemy one. See if the majority of them feel we should dive the boat.”

Of course, by this time, the aircraft has dropped a bomb down the conning tower.

In fact, what the Captain does as soon as he sees the aircraft is shout, “Dive the boat!” and he and the lookout get off the bridge as quickly as possible.

Even if he were to say, “First Lieutenant, will you please dive the boat,” he has given the aircraft that few extra seconds in which to see his submarine.

This then is what John Paul Jones was driving at. In a ship there must be instant obedience. It is often a matter of life or death, so there can be no room for democratic procedure. There must be, in a word, discipline.

Now if you were to rob a bank and a policeman were to come along and say, “Here, you can’t do that,” there would be little point in him wasting his time unless he could take you to the station and be fairly certain that you would be punished for your crime. If people are to act in a certain way, there must be laws to make them do so, and punishments if they do not.

In the same way, the Navy must have a set of laws and punishments if it is to enforce the type of discipline necessary for a ship in the Canadian Navy this set of laws is known as the *National Defence Act*. It is the law of the land in the same way as the *Criminal Code* but it applies only to people in the service.

Those parts of the *National Defence Act* which directly affect ships are combined into what are called the *Articles of War*. You will find them displayed in every ship or establishment in the Royal Canadian Navy.

The Articles of War are no new thing. The first ones on record date back to the thirteenth century. They were based on the *Laws of Oleron* which were the regulations for a five ship fleet from the tiny Island of Oleron in the Bay of Biscay. From these laws, the first *Articles of War*, the *Admiralty Black Book*, was compiled.

It is interesting to compare the *Black Book* with our present *Articles of War*.

"Know all men that We, with the aid of upright counsels, have laid down these ordinances."

"Whoever shall commit murder aboard ship shall be tied to the corpse and thrown into the sea."

"If a murder be committed on land, the murderer shall be tied to the corpse and buried alive."

"If any man be convicted of drawing a knife for the purpose of stabbing another, or shall have stabbed another so that blood shall flow, he shall lose a hand."

"If a man strike another with his hand, he shall be ducked three times into the sea."

"If any man defame, vilify, or swear at his fellow, he shall pay him as many ounces of silver as times he has reviled him." (Fines may be levied in the RCN).

"If a robber be convicted of theft, boiling pitch shall be poured over his head and a shower of feathers be shaken over to mark him, and he shall be cast ashore on the first land at which the Fleet shall touch."

Later, in the time of King Henry VIII, a further book of

Instruction was published. One of the orders in it is of special interest to new entries.

"If any man within a ship ha;s slept upon his watch four times and so proved, this be his punishment."

"The first time he shall be headed at the mainmast with a bucket of water poured upon his head."

"The second time he shall be armed, his hands held up by a rope, and two buckets of water poured into his sleeves."

"The third time he shall be bound to the mainmast with gunchambers tied to his arms and with as much pain to his body as the Captain will."

"The fourth and last time being taken asleep he shall be hanged to the bowsprit end of the ship in a basket, with a can of beer, a loaf of bread, and a sharp knife, and choose to hang there until he starve or cut himself into the sea."

These laws may seem harsh to us today, but it must be remembered that they were designed for the type of man who went to sea in those days. For example, pilots were not above working in league with salvagers and wreckers ashore. So if the Captain and crew of a ship were stranded as a result of negligence of the pilot, they were authorized to behead him.

However, many of the punishments were inexcusably cruel. Hanging was not as quick as it is today. The condemned man was hauled up at the yardarm so that the noose around his neck slowly strangulated him. The most common type of punishment was flogging with a "cat-o'-nine-tails". After a man had been convicted he was placed in leg irons on the upper-deck for 24 hours while he made his own cat. The ship's company was then convened, and with caps off heard the *Article of War* which the offender had contravened. The man was then secured to a grating, stripped to the waist, and lashed with the cat, often until his back looked like a cut of raw meat. He was then taken below to have salt rubbed in the wound. It is interesting to note that the preliminaries to this punishment were conducted in exactly the same way that a punishment warrant is now read in HMC ships.

In the Royal Canadian Navy today, the only crimes punishable by death are those of a traitorous or cowardly nature, spying, and leading a mutiny. All other offences are punished by imprisonment or lesser punishment.

In dealing with small offences, imprisonment is obviously not practical, so in the mid-nineteenth century, with flogging becoming less popular, a numbered set of minor punishments was introduced. This system is carried on to this day, and *Queen's Regulations for the Canadian Navy* (QRCN) lay down the following:

Punishment number I	Detention
Punishment number 2	Reduction in rank
Punishment number 3	Deprivation of Good Conduct Badges
Punishment number 4	Fine
Punishment number 5	Extra work and drill during nonworking hours until 2100
Punishment number 6	Stoppage of leave
Punishment number 7	Stoppage of grog
Punishment number 8	Two hours extra work and drill per day
Punishment number 9	Caution.

Captains are restricted in the amount of punishment they may award, and they must apply to the Flag Officer for permission to award the more serious punishments. If a captain feels that his powers of punishment are not enough to deal with a certain case if the charge should be proven, he may apply to the Flag Officer for a court martial to be convened. The maximum sentence of a general court martial is death.

Defaulters

Routine at "defaulters" is quite simple. When the defaulter is called by the Chief Petty Officer or Petty Officer who is bringing up the case, he doubles to a point just in front of the table. The Petty Officer will then order, "Off caps," and the charge or charges will be read. Then the delegated officer examines the case by questioning the defaulter and any witnesses. On completion of the investigation, the officer may do one of four things.

1. He may dismiss the case
2. He may award a punishment
3. He may pass the case on to the appropriate senior officer
4. He may stand the case over to collect more evidence. Whatever the decision is, it will be repeated by the Petty Officer who will then order, “On caps; left (or right) turn; double march.”

If the case is of a serious nature, the delegated officer may wish the answers to his questions to be written down so that they may be used as evidence later on. In this case he will order the man to be *cautioned*, and the petty officer will say to the defaulter as follows:

“You are not obliged to say anything. You have nothing to fear from any threat and you have nothing to hope from any promise whether or not you do say anything, but anything you say may be taken down in writing and used as evidence. Do you fully understand this warning?”

If it seems necessary, the delegated officer may require the defaulter or the witnesses to take an oath that everything they are saying is true.

The procedure outlined above is the same for a witness except that he keeps his cap on and salutes on arrival at the table.

If you are ever a defaulter, there are some things which you can do which will stand you in good stead:

1. Appear smartly dressed, and execute all orders smartly; a good first impression means a great deal.
2. Speak only when you are asked a question or when the investigating officer indicates that you may. Do not get excited and speak out of turn.
3. When you do speak, speak clearly, make yourself heard, and say what you have to say in as few words as possible.

Remember that the defaulter’s table is a court of law in the same way as the Magistrate's Court in civilian life. The National Defence Act has been passed through parliament as a law of Canada.

Remember also that the officer dealing with your case is well experienced in dealing with sailors. There are very few new stories to be told at the defaulters table, and there are very few loopholes in the Articles of War . . . both have been perfected over some six hundred years.

Organization

Compare the Navy with a large industry say the automobile industry. The product of an automobile industry is a car:

(a) that can cope with modern road conditions,

(b) that will go immediately the driver wants it to go without breaking down,

(c) that will be reasonably inexpensive to produce, run and maintain,

(d) that will look good to the public. The product of the Navy is a seaworthy ship

(a) that can cope with modern weapons,

(b) that is instantly ready to go into action,

(c) that will be reasonably inexpensive to build, run, and maintain,

(d) that will be smart and a credit to Canada.

The Navy obtains a hull from the shipyard, and it is just a hulk until it gets a good captain and an efficient ship's company. Then it suddenly becomes a live ship. In this way the Navy makes a ship just as surely as the car manufacturer makes a car out of bits of steel, rubber and glass.

Behind the car industry, there is a tremendous organization and, in the same way, behind the Navy is a tremendous organization.

But why should sailors be interested in what goes on in Headquarters anymore than the man who inserts sparkplugs into engine blocks is interested in the workings of his head office?

There is a very good reason.

The sparkplug inserter works in the same place at the same time year in and year out at a job that varies little from year to year. The sailor, on the other hand, works in a variety of places, at a variety of jobs, and not the least of these jobs is to hazard his own life if the occasion demands it. He must have faith in the organization which provides him his jobs, otherwise he would be a fool to do them. To have faith in this organization, the sailor must understand it. Not only must he know what his foreman and manager do, but he must know what the managing director of the firm does, and how the board of directors operates. If he does not know these things, he can have little faith in the organization, and if he has not that faith he is untrustworthy and of no use to the Royal Canadian Navy.

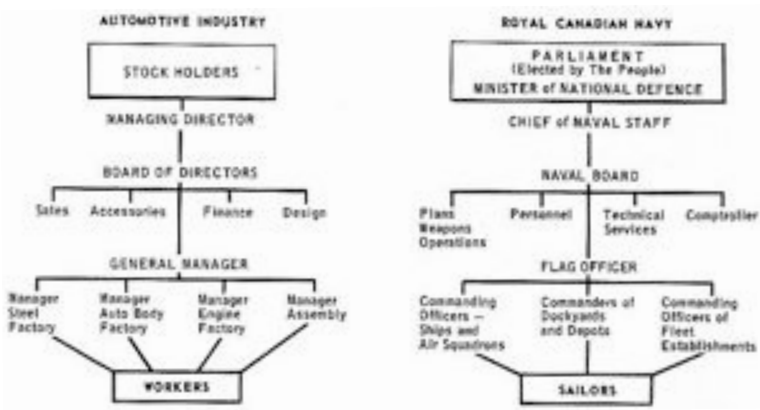


Figure 3-1

The need for discipline has already been discussed in this chapter, and for the same reason as rigid discipline is necessary in a ship, it is necessary among units of the fleet. In other words, just as a ship's company must have its Captain, a Captain must have his Flag Officer, and a Flag Officer must have his Chief of Naval Staff. To take this idea to its extremes, the Chiefs of the Army, Navy, and Air Force are disciplined under a Member of Parliament known as the Minister of National Defence, and the Parliaments of the British Commonwealth are disciplined under the Queen or her representative. Thus every ordinary seaman is a cog in the machinery which revolves around the Sovereign Head of his country. It is now necessary to examine this idea more closely.

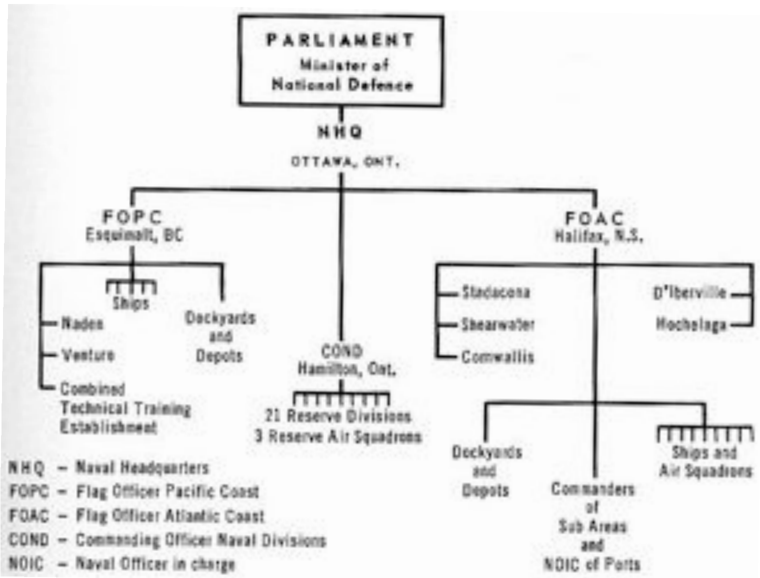


Figure 3-2 Naval Setup

The active Royal Canadian Navy is divided into two commands, one for each coast. The commanding officers of the units of each command the factory managers as it were are responsible to the Flag Officer. For example, the Commanding Officer of HMCS *Cornwallis* is responsible to the Flag Officer Atlantic Coast (CANFLAGLANT). Now the Flag Officers of the coasts together with the Commanding Officer Naval Divisions across the country are responsible to the Chief of Naval Staff who issues his various orders through the Naval Secretary. Beyond that comes the link up with the government of Canada, but this is beyond the scope of this book. Chapter 1 has shown how greatly the people of Canada, through their parliament, can influence each and every member of the Navy.

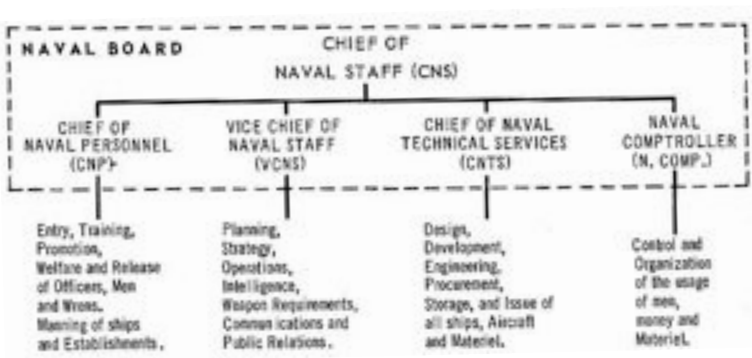


Figure 3-3 Naval Headquarters

Rank

To run the type of organization the Navy must have, it is necessary to distinguish between the people who give orders, and those who obey. (Indeed, every person in the Navy must do both at some time.) To do this we have a system of tank. Logically, persons of different rank wear different distinguishing marks.

It is obviously necessary for every sailor to know the various ranks in the Navy, and in this day and age when the three services work closely with one another, he should know the ranks of the other two services as well. The equivalent ranks of the three services and their distinguishing marks are shown in Figure 3-4.

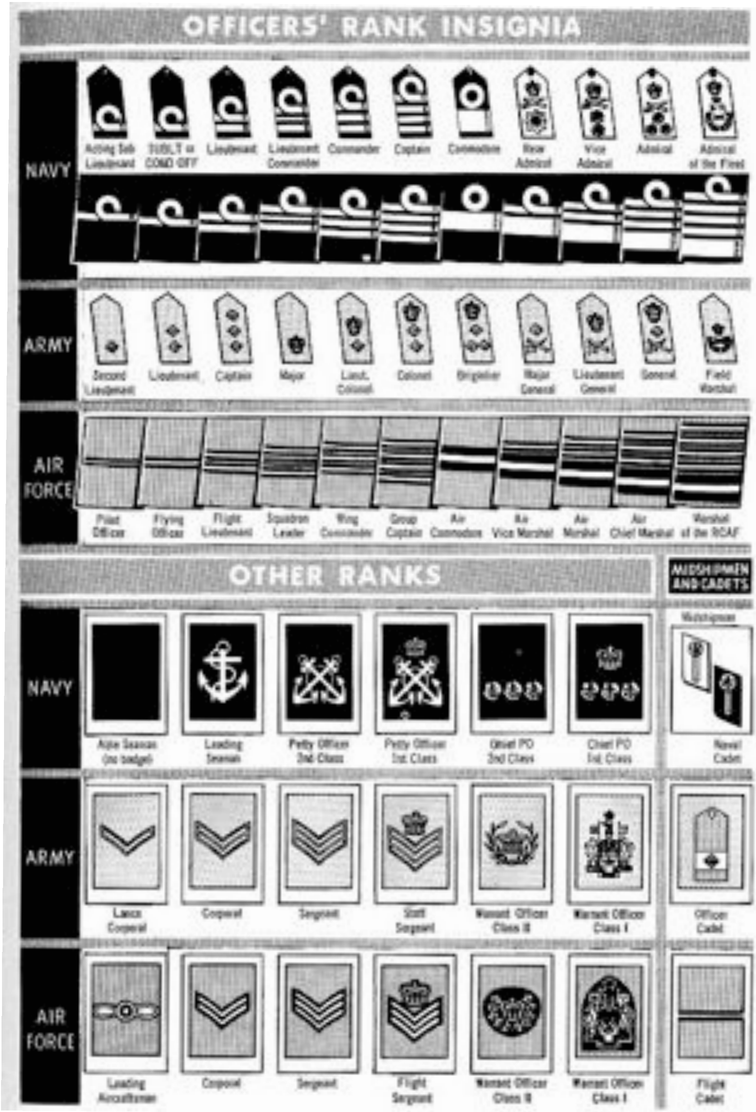

OFFICERS' RANK INSIGNIA
NAVY
Lieutenant
Lieutenant Commander
Commander
Captain
Commodore
Rear Admiral
Vice Admiral
Admiral
Admiral of the Fleet
ARMY
Second Lieutenant
Lieutenant
Captain
Major
Lieut. Colonel
Colonel
Brigadier
Major General
Lieutenant General
General
Field Marshal
AIR FORCE
Pilot Officer
Flying Officer
Flight Lieutenant
Squadron Leader
Wing Commander
Group Captain
Air Commodore
Air Vice Marshal
Air Marshal
Air Chief Marshal
Marshal of the RCAF
OTHER RANKS
MIDSHIPMEN AND CADETS
NAVY
Able Seaman (no badge)
Leading Seaman
Petty Officer 2nd Class
Petty Officer 1st Class
Chief PO 2nd Class
Chief PO 1st Class
Midshipman
Naval Cadet
ARMY
Lance Corporal
Corporal
Sergeant
Staff Sergeant
Warrant Officer Class II
Warrant Officer Class I
Officer Cadet
AIR FORCE
Leading Aircraftman
Corporal
Sergeant
Flight Sergeant
Warrant Officer Class II
Warrant Officer Class I
Flight Cadet

Figure 3-4

The Divisional System

Since the days of Lord Nelson and before, the Navy has prided itself in being just. Gradually, over the years and centuries, a system has been worked out to allow sailors to exercise their rights and liberties as people even though they are subject to the rigid discipline of the *Articles of War*. This system is called the "divisional system."

In the divisional system, men are divided into groups of those who work at the same job or in the same location. This is because people working at the same job are liable to have the same problems.

To guide this group of men, or division, and sometimes, but not always, to supervise its work, there is a chief petty officer and an officer. These people are the go-betweens between the men in their division and the other authorities in the ship.

The Divisional Chief Petty Officer is a well experienced man. If a member of his division has a problem or needs guidance, he goes first to the Divisional Chief Petty Officer, and most times he will be satisfied. On the other hand, if a man is being a problem to the division or to the ship, the Divisional Chief Petty Officer is the first man to try to correct him.

However, certain requests or problems a man may have are beyond the powers or knowledge of the Divisional Chief Petty Officer. In these cases the man is brought before his Divisional Officer. Again, if the Divisional Chief Petty Officer finds he cannot correct a "problem sailor," he brings the man before the Divisional Officer as a defaulter. The procedure for defaulters has been discussed earlier in this chapter; that for requestmen will be discussed later.

If the Divisional Officer cannot solve a problem or grant a request, he may bring a man before the Executive Officer, who, in turn, may bring the man before the Captain. The Captain, if he sees fit, may pass the matter on to the Flag Officer, and the Flag Officer may pass it to Naval Headquarters.

This routine is known as "the proper service channels of the divisional system."

It is easily seen that any man has the right to take a matter to the highest authority if it is necessary to solve that matter. the only stipulation is that the proper service channels are adhered to . . . all matters must start with the Divisional Chief Petty Officer.

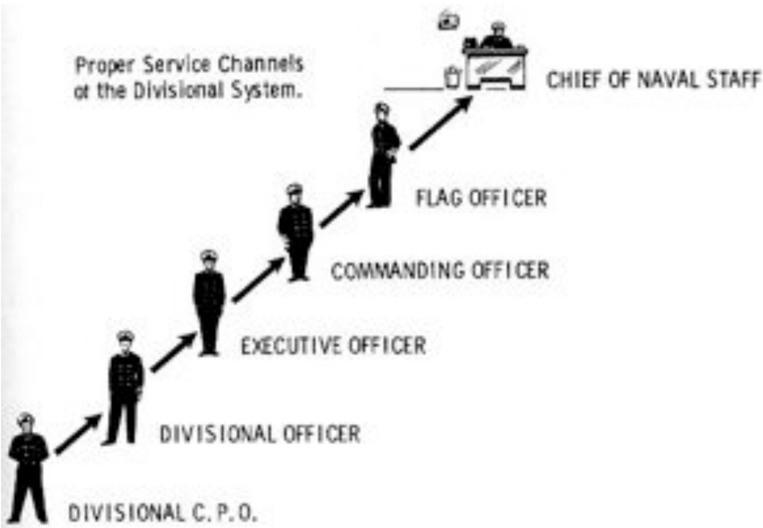


Figure 3-5

The problems or requests that may be brought to the Divisional Officer are many and varied. It may be a simple request for leave, a personal problem, a service matter concerning rank or rating, a desire to be released, or a request for guidance or help. It has been said that you can request anything in the navy, but there is no guarantee that you will get it.

However, there is one type of request which deserves special attention, and that is a request to state a complaint or a grievance. QRCN lays down the following:

(1) "If an officer or man thinks that he has suffered any personal oppression, injustice, or other ill-treatment, he may complain orally to the Captain.

(2) "If an officer or man thinks that he has been wronged by the Captain . . . . he may complain in writing to the Captain.

(3) "If the Captain has not redressed a complaint made under (2) of this article within fourteen days of its receipt by him, the complainant may submit his complaint in writing to the Senior Officer in Chief Command.

(4) "If the complainant does not receive from the Senior Officer in Chief Command the redress to which he considers himself entitled, he may submit his complaint in writing to the Chief of Naval Staff who shall, if the complainant so requires, submit the complaint to the Minister.

(7) "Every complaint shall be submitted through the usual channels except that if the Captain of a ship or establishment or a senior officer in command does not forward a complaint to higher authority when requested to do so, then that complaint may be forwarded direct.

(9) "No officer or man shall be penalized for making a complaint in accordance with this article . . ."

That is to say, that if a man feels he has been done an injustice, no matter by whom, he can appeal to successively higher authority until justice is done. Furthermore, he need not fear any consequences from doing so. However, naval organization has progressed so far that it is seldom necessary to state a complaint, and the case of having to take one beyond the Captain is rare indeed.

Requestmen

The procedure for requestmen is similar to that of defaulters except that you do not remove your cap. You are called to the table in the same way, you salute, and the request is read by the Petty Officer. The Officer then considers the matter and either satisfies the requestman, or, if he cannot, refers the matter to the appropriate authority.

Figure 3-6 Request Form

QUIZ

1. Explain in your own words the need for discipline in a ship.
2. Where would you find those laws of Canada which are applicable to a naval vessel? What are they called?
3. What are the minor punishments prescribed for use in the RCN?
4. What is the procedure at the defaulter's table?
5. How does the organization of the Navy and the country relate an ordinary seaman with the Queen of Canada?
6. Explain how you would go through the proper service channels as far as the Flag Officer to have a request granted.

7. What would you do if you were ill-treated by someone senior to yourself?

The answers to these questions may be found in Chapter 3. When you can answer all of these questions perfectly, you may consider yourself to have a fair grasp of this chapter.

Chapter 4

THE SEA

Young men with a taste for adventure have been running away to sea since ships were first built. Being land animals, their curiosity has been stirred by the sea it has fascinated them. They have found that it may be as gentle as, a lamb or as terrible as a hungry tiger; that in any case, it is as unpredictable as a woman, and, like a woman, it must be conquered before it is any use. Running away to sea in the old days, many young men perished because they had no knowledge of the sea.

Although oceans and seas take up about 70 percent of the earth's surface, we still know very little about them. This is because water is not man's natural environment, and, while he can observe an ocean's surface comparatively easily, he runs into great difficulty getting below the surface to any appreciable depth.

Water is heavy. It exerts its weight (about 10 lb. per gallon) upon any object that is beneath its surface. The deeper the object is, the greater the weight of water pressing on it. This is called water pressure. You have experienced its effect on your ears when you dive into a swimming pool. Because of this water pressure, the best submarines in the world cannot dive much beyond 500 feet without being crushed. Divers can descend to only about 250 feet, and specially constructed diving devices called bathyspheres have been down to over 30,000 ft. But the mean depth of the sea is about 12,500 feet. The greatest known depth is about 34,450 feet, or almost 5000 feet deeper than Mt. Everest is high. Is it any wonder we know little about the sea?

Until about 1925, it was not possible to measure the depth of the sea except with a weight and measured line. However, after 1925, the echosounder came into use. This device measures the length of time it takes for a sound to travel to the bottom and for the echo to get back to the ship. Knowing the speed of sound in water, it is then a simple matter to

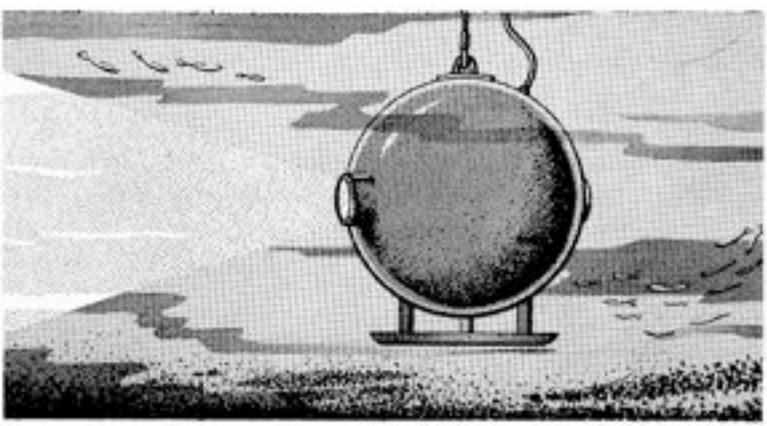


Figure 4-2 Submarine Bathysphere

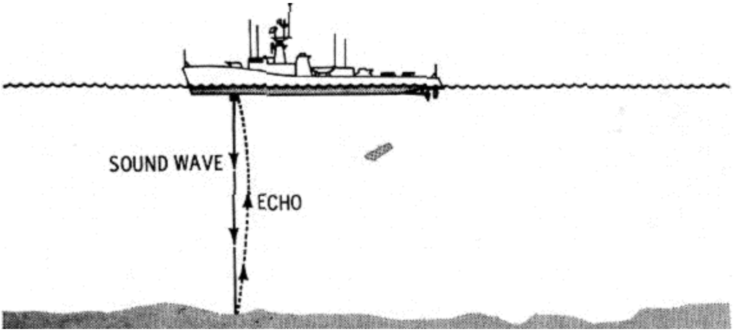


Figure 4-3

calculate the depth of the ocean bed. For example, suppose you transmit a sound, and it takes four seconds for the echo to get back to you.

Then you know that it must have taken a half of four seconds, or two seconds to get to the bottom. If you reckon that sound travels at about 4,800 feet per second in water, then the depth of the water must have been 2 x 4,800 or about 9,600 feet.

Before the echo sounder was invented, it was supposed that the bottom of the sea was fairly flat. Now we have found that, far from being flat it is almost as irregular as land. There are mountains and valleys, canyons and plains under the sea just as there are ashore.

No one is quite sure how the sea came into existence. It is known that millions of years ago parts of what are now North America and Europe were under water. It is also known that during the ice ages the level of the sea dropped so that there was much more land about. But how it all began we can only guess, and to say that God made the sea on the third day of creation is the oldest and probably the best answer yet.

Tides

You have noticed how the level of the sea rises and falls quite regularly along the shore line. This is the effect of tides. It was thousands of years ago when man first noticed that the rise and fall of tides have some relation to the behavior of the moon, but it was not until the seventeenth century that one man, Sir Isaac Newton, was able to explain this invisible relation.

Newton said that any two bodies in space attract each other, just as, for example, the earth attracts an apple and causes it to fall. The moon has an attraction for the earth and, by its pull on the sea, causes tides. But, of course, the moon does not fall like an apple there are other forces keeping it in its orbit around the earth. Similarly, the sun affects tides, but to a much lesser extent because the sun is much further away.

There are other forces which act on tides besides the earth and sun, and over the years scientists have learned to calcu-

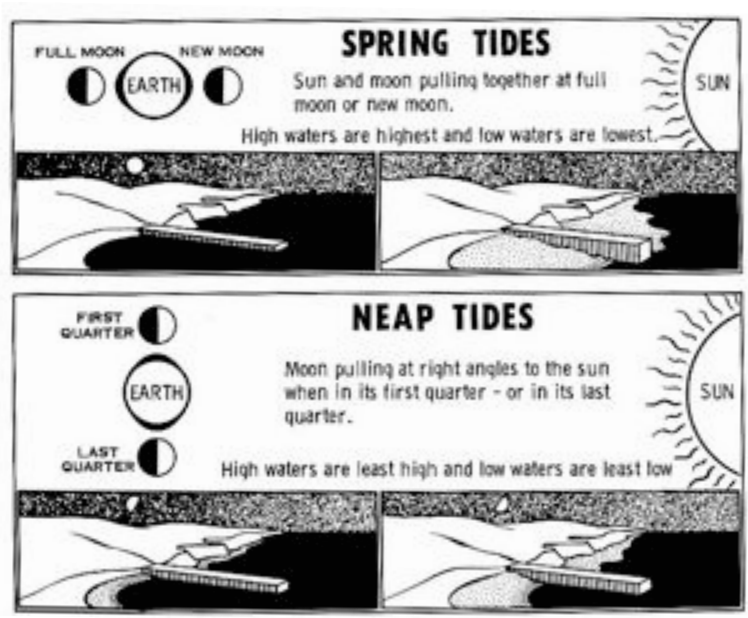


Figure 4-4

late these forces and thus predict the tides. In fact, simple tide tables existed as early as the thirteenth century. Present day tide prediction tables are far from simple, but they allow you to predict the tides in almost any part of the world.

A rising tide is said to be *flooding*; a falling tide is said to be ebbing. When the sun and the moon are in line, they combine their forces and there are the highest or *spring tides*. When their forces are at right angles with one another, there are the lowest or *neap* tides.

Because of the effects caused by the shape of the coast and the shape and depth of the sea bed, the timing and height of tides vary from place to place. As a very rough rule, the time between a tide reaching its highest level and its next succeeding lowest level is about 6 hours 15 minutes. There is no rough rule for the height. Some of the highest tides in the world occur at Windsor, Nova Scotia. Here, the difference between high and low water may be more than 40 feet. Many localities in the Mediterranean Sea have little or no tide.

Ocean Currents

In April, 1912, the new British passenger liner *Titanic* was in the North Atlantic on her maiden voyage. *Titanic* had been widely publicized as "unsinkable," and the passengers in

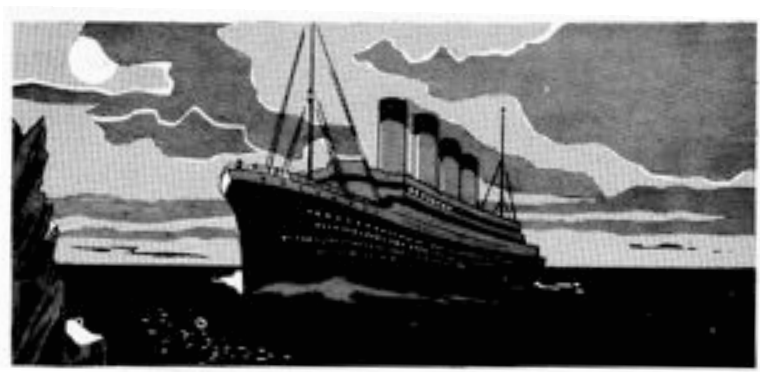


Figure 4-5 Titanic: A Victim of Ocean Currents

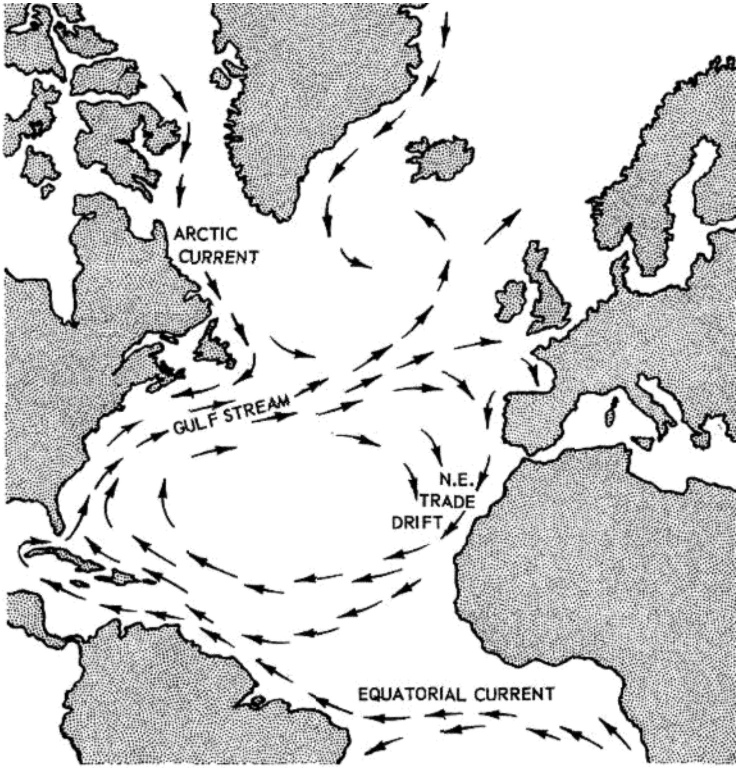


Figure 4-6 Ocean Currents

her, consequently, felt very safe, and were in fine spirits. Even when she struck an iceberg and had a hole 300 feet long torn in her hull, no one really thought she would sink. But she did sink, and over 1,500 people lost their lives.

But where did the iceberg come from? *Titanic* was not steaming in ice she was hundreds of miles south of it. How did an iceberg get into the North Atlantic?

The answer is perfectly simple. The iceberg was borne south on an ocean current.

Currents exist in all the oceans of the world. In the northern hemisphere they move clockwise; in the southern hemisphere, counterclockwise.

They are enormous movements of water. For example, the Gulf Stream past New York (see Figure 46) carries 50,000,000 tons of water per second. This is roughly fifty times the total amount of water poured into the ocean by all the rivers in the world.

The energy involved in an ocean current makes a nuclear bomb seem as negligible as a drop of water in a lake. Where does this energy come from? What makes ocean currents flow? First of all, it should be stressed that tide has nothing whatsoever to do with ocean currents. The main causes of ocean currents are wind and temperature. In many parts of the world, the wind is fairly constant in direction. This causes a drag on the water over which it is blowing. You can prove this quite easily when you are next taking a bath. Bend down and blow on the water by your side for a few seconds, then put a floating object where you were blowing. You will find that it floats away in the direction you blew.

The other cause of currents, temperature, is a little more complicated. When water gets warm, it expands slightly; when it gets cool, it contracts. So between the Equator where water is being warmed and the Arctic Circle where it is being cooled, there is always a difference in the volumes of water. So the water is always higher at the Equator than it is at the Arctic Circle. This means that there is always a down hill gradient between the Equator and the north, and the water naturally flows down hill. The gradient is about .11 inch in a mile.

Ocean currents are of great importance to the human race. Without them, the seas would stagnate, lose their oxygen, and be unable to support any life.

Sea and Swell

You will have noticed that wind blowing across water produces waves. If you blow across a pan of water you will see waves formed. But you may also notice that when you stop blowing, the waves do not immediately stop. Now there are two types of waves on an ocean: those that are actually being caused by the wind at that time, and those that have been caused by the wind in some other place or at some other time. The former type is called sea, and the latter type called swell. At most times there is sea and swell at the same time.

Figure 4-7

When the wind first makes a wave, the wave short and steep.

Figure 4-8

After the wind has blown on the wave for a while, it gradually grows larger and smoother, and eventually, when it travels out of range of the wind, or when the wind stops blowing, it becomes a swell.

Figure 4-9

Now suppose there is a swell and the wind begins to blow on it again. Then waves called sea are formed on the swell.

Figure 4-10

When the wind has blown on a wave for long enough it will begin to push the top or crest of the wave faster than the rest. This is because the wind can get at the crest better than the bottoms or troughs. Thus, eventually, the crest will break when it is pushed too far ahead.

Figure 4-11

Navigation

Navigation is the art of directing a ship from one point to another on the sea. It is not just a matter of pointing the ship in the right direction; many, many difficulties creep in. Tides, ocean currents, wind, swell, depth of water and many other factors affect a ship traveling on the sea. Anyhow, how do you know you are steering in the right direction in the first place?

First of all, then, it is necessary to be steering in the right direction and to do this we use a compass. A compass is an instrument which always points north or near it. There are two types of compasses in most ships. One is the magnetic compass, which employs the earth's natural magnetism, and the other is the gyro compass, which, as its name implies, employs the principle of the gyro.

So you say that you will have to keep your ship pointing so far east or west of north, and this is called your course. The compass is divided into 360° (see diagram) and courses are always given in degrees, for example, course 268°, or 035°.

Now, if there were no other factors affecting your ship, this course would take you from point ‘A’ to point ‘B.’ But there ARE other factors, so you change your course to cope with tide, wind, current and so on.

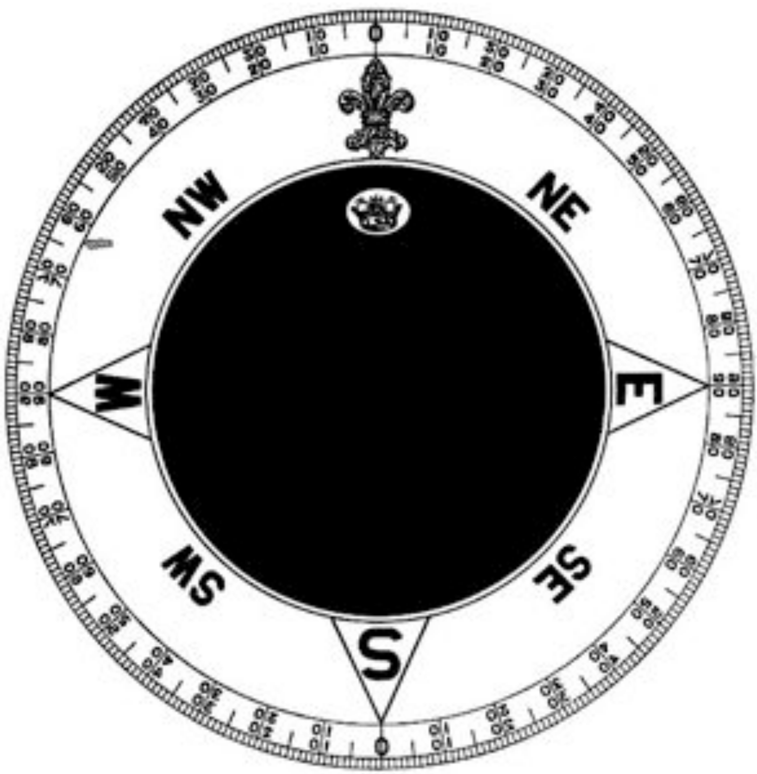


Figure 4-12 A Quadrantal Compass Card

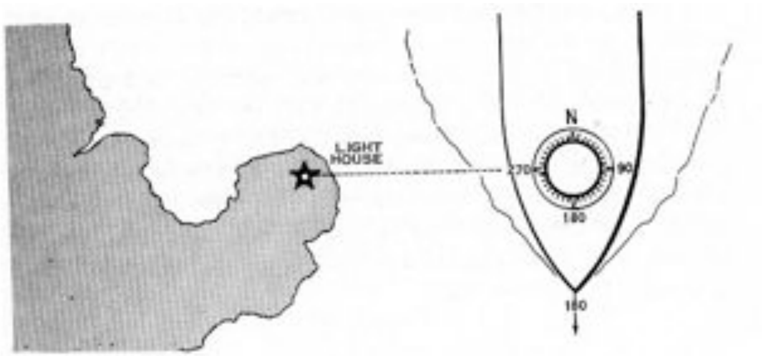


Figure 4-13 The Lighthouse Bears 270

But you can never be absolutely certain. There may be some other factors you didn't know about or hadn't remembered. So you must keep a check on where you are. Obtaining a position is known as *fixing the ship's position* or *taking a fix*. There are several ways in which this may be done.

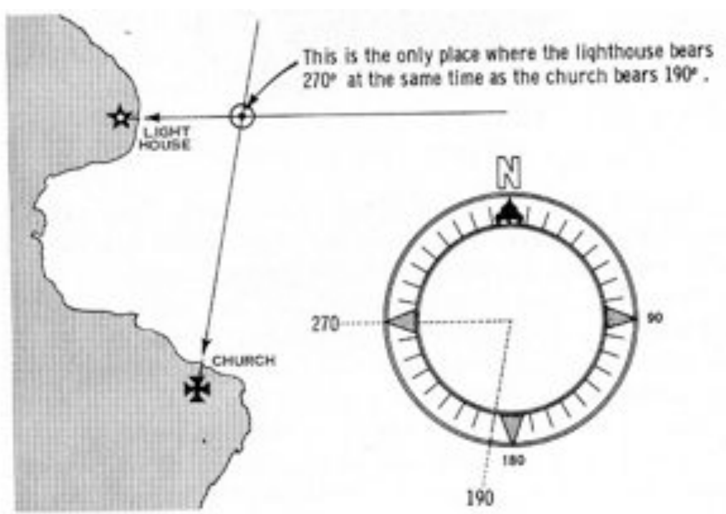


Figure 4-14 A Visual Fix

If you can see land, the compass is used to find out at what angle to your ship certain objects ashore are. For example, looking along your compass you may see that a light house is along the 270° line. That is to say, it “bears” 270° you may see that a church steeple bears 190°. These objects are now found on a chart, and lines are drawn from there at the correct. angle. Where the lines cross must be where the ship is because there can only be one place from which the two objects will have exactly the bearings you have seen. This is shown in Figure 4-14.

Figure 4-15 A Sextant

Suppose land is not in sight. What then? Then sailors obtain their position lines from the stars or the sun by use of a sextant and a complicated mathematical formula.

There are many other methods used for fixing a ship’s position. The depth of the sea, because it varies from place to place, is helpful, and often position lines are obtained using artificial means such as radio or radar.

The art of navigation is as old as ships are. As time goes on, it is getting more and more complicated, but, at the same time, more and more accurate. However, the old and simple methods are still in use when the circumstances allow it.

FLORA AND FAUNA OF THE SEA

The sea is rife with plants and animals of as many or more varieties than there are land plants and animals. As you have seen, many of these plants and animals live in a world no human has ever explored, so we know little about them. Even those that live near the surface have some mystery about them scientists are in some doubt about the habits of many of the fish you see on the dinner table regularly. The reason for this is fairly obvious men cannot live in water, and fish will not stand still to be studied.

FISH

Of the 30,000 or so varieties of fish the largest is the whale shark which runs up to 70 feet in length (almost 3 whalers end to end!), and the smallest is the goby (from the Philippine Islands) which may be less than a quarter of an inch fully grown. Among the most interesting fish you will see when you go to sea is the flying fish. This fish has fins developed as wings and takes off by swimming at speed on the surface with its fins spread. Flying fish may fly 1,200 or more feet at heights up to 40 feet, and they have been known to remain airborne for over 40 seconds. Many of these fish may land on the decks of a lighted ship at night they are good to eat.

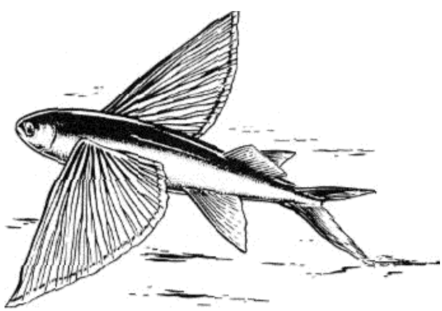


Figure 4-16 Flying Fish

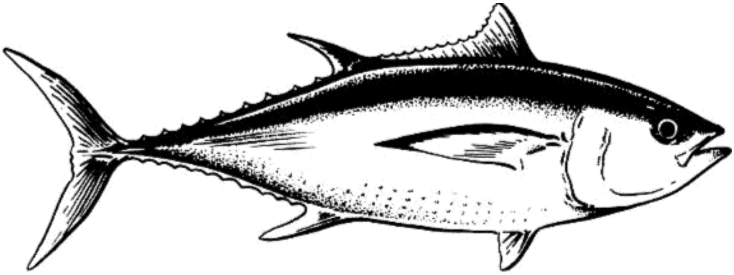


Figure 4-17 Tuna

The fastest of fish is the tuna which is capable of 30 knots in short bursts. Tuna being fished on the west coast of Canada have been known to tear their own heads off by striking a lure at too great a speed.

Among other peculiar types of fish are those which travel over land (mudskippers), those that can breathe atmospheric air (like the tarpon); those which can deliver an electric shock of up to 600 volts (rays); and those which can actually light themselves at will (some sharks). A study of fish is certainly no bad hobby for the young seaman.

Plants

The most common of marine plants are those many varieties which go by the name of seaweeds. These plants vary in size from those of two or three cells which are not visible to the human eye except in large groups, to Pacific Ocean kelp which runs up to several hundred feet in length and is probably the longest plant in existence.

Some sea plants are quite edible, and some are considered a great delicacy in many parts of the world. Many types of fish and some birds feed on sea plants of various sorts.

Seabirds

You will see many birds when you get to sea. Some of them will be so far at sea that you may wonder how they got there and how they live. Birds have long been the friends of seamen. The gulls swooping and gliding about the bows of a ship at sea are a happy sight. In fact, some natives of South Pacific islands used to (and probably still do) navigate by observing the type of bird they encounter in certain localities.

The birds you encounter near the shore will probably be one of the 43 species of gulls.

Figure 4-18 Gull

Only one variety of gull actually flies out of sight of land. This is the kittiwake, which traverses the whole North Atlantic.

Gulls live mainly on animal matter, living or dead, but they are extremely partial to tidbits ditched from passing ships.

Other types of birds commonly found at sea are albatrosses and petrels. These are birds of the same family, the albatross having the largest wingspan of any living bird (12 feet). Since the famous poem *The Ancient Mariner* by Coleridge (but *not* before it), to kill an albatross has come to mean bad luck for a sailor. These birds live mainly on fish, but, like gulls, they are fond of any garbage which may come their way.

Figure 4-19 Albatross

One small form of petrel called Mother Carey's Chicken is often seen at sea, particularly in stormy weather, and have a very definite superstition attached to them. These birds fly so low to the water in a storm that they seem to walk on the water hence "Petrel" is derived from Peter or Saint Peter. Mother Carey is supposed to be derived from the Latin "Mother Carey" or "dear Mother," a name given the Virgin Mary. The superstition has it that sailors look with dread upon Mother Carey's Chickens or stormy petrels as they are known.

Sea Mammals

Some of the life you will see at sea is of the mammal class of animals, just as you are. The most common members of this group belong to the whale family which includes porpoises, blackfish and dolphins.

The whale is the largest mammal that has ever lived on earth. They have been known to grow up to 110 feet in length, which would put their weight at about 180,000 lbs. However, the normal whale you will encounter will probably be around 50 to 60 feet in length. The whale, like all other sea mammals, has to surface to breathe. While it is underwater, which may be 20 minutes to a half hour, the whale holds its breath.

You will probably encounter a great many porpoises during your time at sea. They are very found of frolicking in large

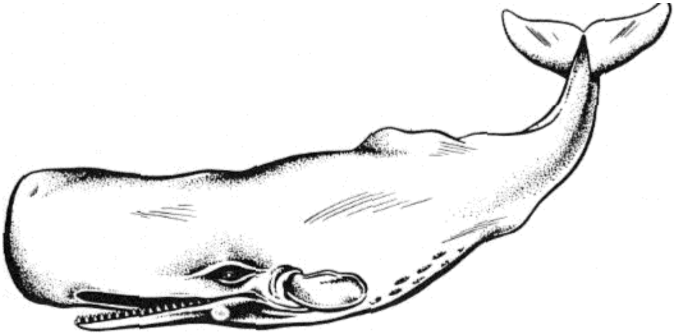


Figure 4-20 Whale

schools around the bows of ships, and sometimes scratch their backs on the barnacles of a ship's bottom. Blackfish and dolphins are two of the 60 or 70 varieties, of porpoise. Some porpoises are extremely friendly animals and have been known to be tamed to the extent where they will frolic in the sea with children.

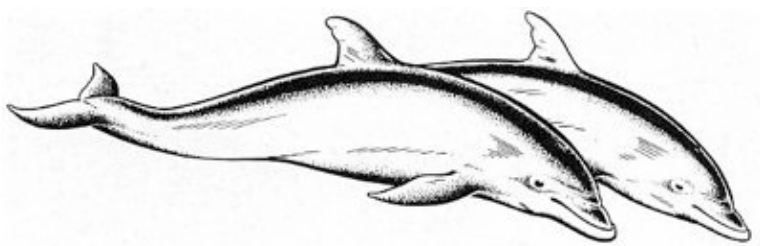


Figure 4-21 Porpoise

SURVIVAL

You often hear of the exploits of survivors from sunken ships who have been weeks, sometimes months, adrift on the open sea, before they were rescued. Similarly, you hear stories of men in the same circumstances who have perished after a few hours or a few days. What was the difference?

There is a good deal of luck involved in surviving the sinking of your ship. The circumstances under which you were sunk, your bodily health, whether you are in the tropics or the arctic: all of these things have a great influence on your chances of survival, but once you are out of the ship and in the raft you can assist Lady Luck immeasurably by knowing what to do and when.

The thought in the back of your mind all the time must be, “what are my chances of being picked up?” In fact, the chances are very good indeed. If your position was reported and the weather is not too bad, normally you can except to be picked up within two days. Even during World War II over half the total of survivors were rescued in two days. If your position has not been reported, you can expect to be about five days before rescue. So the primary object, once you are in the life raft, is to keep yourself and your companions alive and reasonably fit until the rescue is accomplished.

Figure 4-22

Barring injuries received in the ship's sinking, there are two main causes of death among survivors. They are thirst and exposure.

Thirst

Your body normally contains 70 pints of water, and it can stand to lose about 26 of these pints before you die of thirst. If you could lie quite still and not sweat, you would lose about 1% pints of water a day through evaporation, breathing, opening bowels and passing water. This gives you about two weeks to live without water. In fact, as a survivor you will be moving about and doing some work, so this time is shortened considerably. If you are sweating, you may lose the 26 pints in as short a time as 24 hours.

Exposure

The human body regulates its temperature very finely. Under normal conditions it produces heat chemically if you get too cold, and it produces sweat to cool you if you get too hot. But if conditions are so cold that the body cannot produce heat as fast as you are losing it, then you suffer from exposure. The normal body heat is 98.6°F. When that temperature is reduced to about 86°F, you lapse into a state of stupor. If the temperature continues to drop, you die. Death from exposure may occur in as little as a few hours.

The Life Jacket

Every person in a ship is provided with a life jacket, and it is each person's responsibility to take care of his own life jacket. You will feel very foolish if you can't find your life jacket when "emergency stations" is piped, and you will feel worse than foolish when you land in the cold sea without ore. During the Second World War the gallant Captain of a sinking Canadian ship gave his life jacket to a young seaman who for some reason didn't have one. This Captain drowned. If that is not sufficient lesson for you, ditch this book over the side you are wasting your time reading it.

Figure 4-23 RCN Inflatable Life Jacket

The standard life jacket is shown in Figure 4-23. It is inflated by means of a carbon dioxide cylinder, but should this fail, there is a rubber tube long enough for you to put in your mouth and blow it up yourself. DO NOT inflate your life jacket either way until you have to use it.

The life jacket, stowed in its pouch is worn by all personnel at all times in wartime. The pouch may be turned to face the front or the back, whichever is more convenient. You will also see it worn inflated by all personnel working on the casing of a submarine at sea.

Before jumping off a sinking ship, the life jacket should be inflated, and, if it is night time, the two plugs (see illustration) which protect the battery for your electric light should be pulled out. If you jump off the ship on the lee side, the drifting ship is liable to overtake you; if you jump off the windward side, you will probably jump into oil fuel. If you have to jump in a hurry, it is best to jump from either end of the ship. However, if you are properly at emergency stations, you will probably be able to jump from the sides directly alongside a raft. There is little danger in jumping with your life jacket inflated. Men have jumped from 25 to 30 feet with no ill effect.

The RCN 20 Men Inflatable Life Raft

The designers of the life raft used in the RCN have taken into account the factors of survival, particularly protection from exposure to wind and weather. It carries the essentials of life for 20 men, and it will carry an overload complement of 27. It may be launched manually, or if the ship sinks before this is possible, it will be released and inflate itself automatically. In the raft itself there are provisions, fresh water, pyrotechnic (fireworks) signals, a flashlight, a knife, fishing outfits, repair kits, fresh water making and collection equipment, and a first aid outfit. There is also a waterproof book showing how all of these items are to be used. It is important that this book be read before any of the equipment in the raft is used.

An inflated raft with no one in it is very light and may turn over in a strong wind or rough sea. If this happens it can be righted by a man standing on the CO_2, bottles and hauling on the righting strap across the bottom of the raft. The men in the water can help by turning the raft so that the pull to right it, takes place down wind. Once men are in the raft, their weight provides the stability to keep the raft upright.

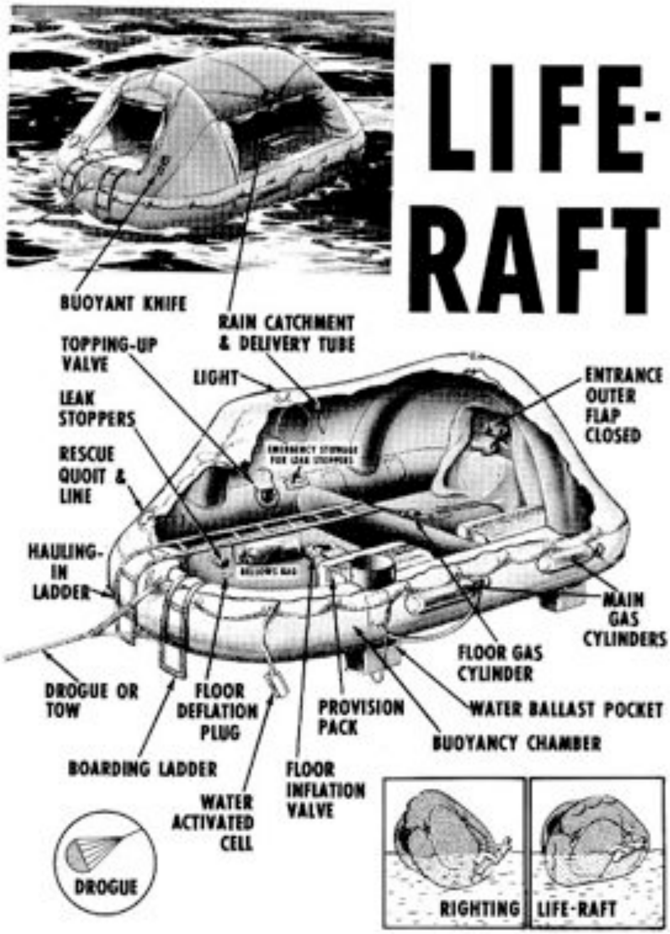


Figure 4-24 RCN 20 Men Inflatable Life Raft

ON BEING A SURVIVOR

The first thing to do on entering a raft is to obey any orders given to you by the senior officer or man in the raft.

The senior officer or man in the raft will take charge at all times, and will relinquish that responsibility only when some one senior to him enters the raft.

The important things to be done are, first and most important, help other swimmers into the raft and search for any other survivors. Listen carefully for whistles being blown by men in the water. Do not go into the water unnecessarily. Use the rescue quoit and line to help draw men to the raft.

The CO_2, provided in the bottles is sufficient to inflate the raft in very cold weather. Under most conditions, there is more gas than necessary. The excess gas vents through the combined safety and topping up valves. The noise of this escape can be confused with the noise of a leak. CO_2, is heavier than air, and is harmful if inhaled in large quantities. Injured and exhausted men must be placed in the raft so that their head and shoulders are above the main buoyancy chambers, until all excess gas has vented and the raft has been ventilated.

Remember that when men are wet, their greatest danger is from chilling winds. The openings in the raft canopy should be closed as soon as possible, and opened only to assist others to board or to ventilate, and kept closed until the men in the raft have dried off.

Rafts should endeavour to keep together. Alternately throwing the drogue towards the next raft and hauling it in, will move the raft in the required direction.

When rafts are together, the senior survivor will take charge of them all and redistribute the personnel in them, so as to provide a senior man in each raft and numbers as evenly distributed as possible.

Do not take food or water on the first day. What you left the ship with, will keep you going. Do take seasickness pills, even if you have never been sick before. The motion of the raft is very hard to get used to.

When the rafts are congregated and it is certain no more men are still swimming, it will be possible to settle down to the business of survival. Setting lookouts, searches for leaks, routine topping up, cleaning, water catching and many other jobs, all as allocated by the officer or man in charge.

At all times remain obedient and if possible cheerful and do your best to help others to be the same.

QUIZ

1. How does an echo sounder work?
2. What causes the rise and fall of tides?
3. What is a tide said to be doing when it is rising? failing?
4. What causes ocean currents?
5. What causes sea? swell?
6. What factors affect the correct course for a ship to take from place to place?
7. What is “taking a fix?”
8. Why do we know so little about the plants and animals of the sea?
9. What are the main causes of death among survivors at sea?
10. When should you inflate your life jacket?
11. What are four general rules you should remember as a survivor in a life raft?
12. What is wrong with drinking salt water?

The answers to these questions may be found in chapter 4. When you can answer all of these questions perfectly, you may consider yourself to have a fair grasp of this chapter.

Chapter 5

SHIPS AND AIRCRAFT

What is a ship?

Think of the things you know about a ship. It floats in water; it can travel from A to B; it can carry men and material. These are the things everybody knows about a ship.

The dictionary says that a ship is “a large vessel for use on water . . . .,” and that is precisely what it is. A vessel is a container and a ship is nothing more than a container which moves about on the water. But the dictionary said “a large vessel”. A boat is not a ship. The difference between a boat and a ship is quite vague, but as a rule of thumb you may say that a boat can normally be hoisted into a ship, whereas a ship is too large to be hoisted into another ship. There is one exception to this rule. Submarines, although they are major war vessels, are called boats.

This vessel or container, this ship, is designed so that it can pass through the water easily. Therefore, it has an edge for cutting through the water just as a knife has a sharp edge for cutting through food. This sharp edge is called the *stem*. The other end, which does not normally have to cut through water is known as the *stern*. The actual shell of the vessel is called the *hull*. Thus the stem and the stern are parts of the hull.

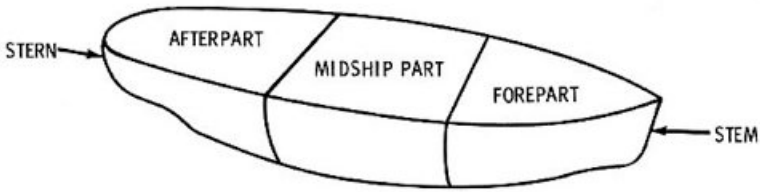


Figure 5-1

You could stand in a ship and say that you were facing the sharp end or the blunt end, but you wouldn't have described your position very well. Therefore, the hull is divided into three parts. There is the forepart, which includes the stem, the afterpart, which includes the stern, and that part between which is called the midship part.

Lengthwise, the ship is divided into only two parts the port side and the starboard side. If you stand in the centre of the ship and face the stem, the left side is called the port side, and the right side the starboard side.

Facing the stem is called facing forward because that is the direction in which the ship is going ahead. Facing the stern is called facing aft. Thus forward and aft, port and starboard, are the directions within a ship.

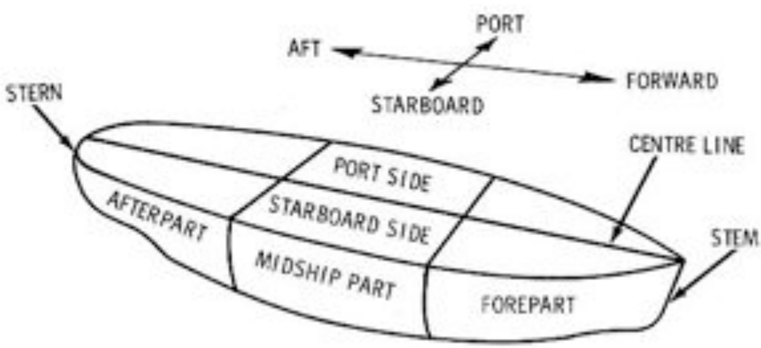


Figure 5-2

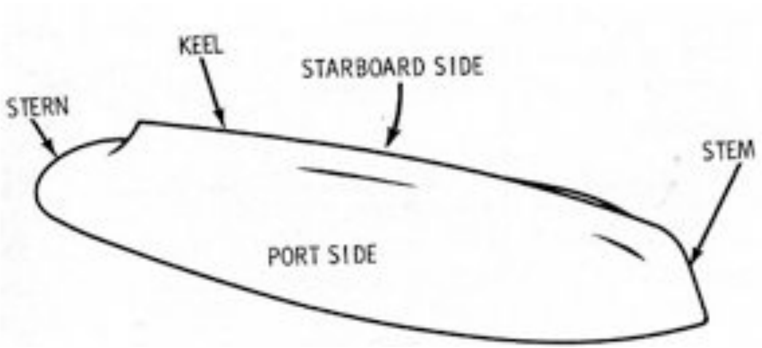


Figure 5-3

The line that runs lengthwise along the middle of the ship is called the *centerline*. On one side of this line is the port side, on the other the starboard side, Where the port side meets the starboard side of the ship's bottom is the main structural part of the ship called the keel. Naturally, the keel runs along the centerline.

The width of a ship is called its beam. If you were to measure the beam by placing a large ruler from side to side, that ruler would be lying *athwartships*. Anything which lies or runs from side to side lies or runs athwartships.

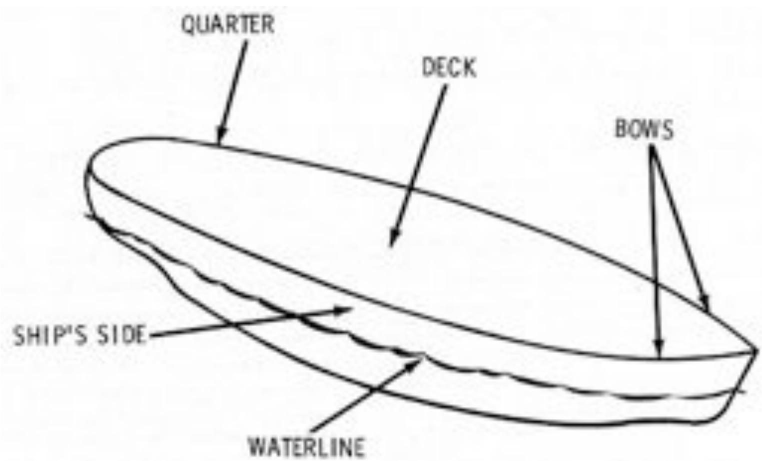


Figure 5-4

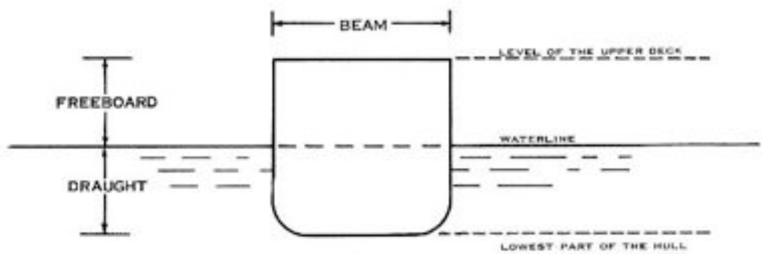


Figure 5-5

So that you can better describe the various places in a ship, the surfaces of the hull are given names. The flat or horizontal surfaces upon which you walk are called decks. The up and down or vertical surfaces of the hull above the water are called the *ship's sides*. Where the ship's side curves inward toward the stem is called the *bow*, and where it curves toward the stern is called the *quarter*. Thus, there is a port bow and a starboard bow, a port quarter and a starboard quarter.

If you could pick a ship out of the water you would see that there is a wet part around the bottom and a dry part where the ship floated above the water. The line between wet and dry is called the *waterline*. The distance from the waterline to the deck is called *freeboard*, and the distance from the waterline to the deepest part of the bottom is called the *draught*.

There are more decks than one in a ship just as there are more floors than one in a building. You will see in Chapter

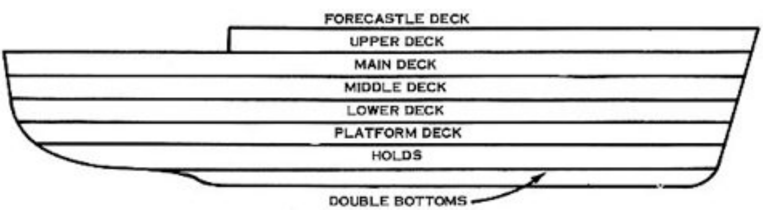


Figure 5-6

10 that there is a number system for identifying the decks, but for ease of reference, there are also names given to the decks. Figure 5-6 gives the names of the decks one may encounter in a warship.

There is a simple way of relating any object, including yourself, to a ship. Suppose you are standing on the forecastle deck and you take your seaman's knife. If you hang it by its lanyard *over the side*, that is, so that it is hanging outside the hull, it is said to be *outboard*. When you pull it in you take it *inboard*. If you then take it down to the main deck you have taken it *below*. The stairs you used to get it there are called

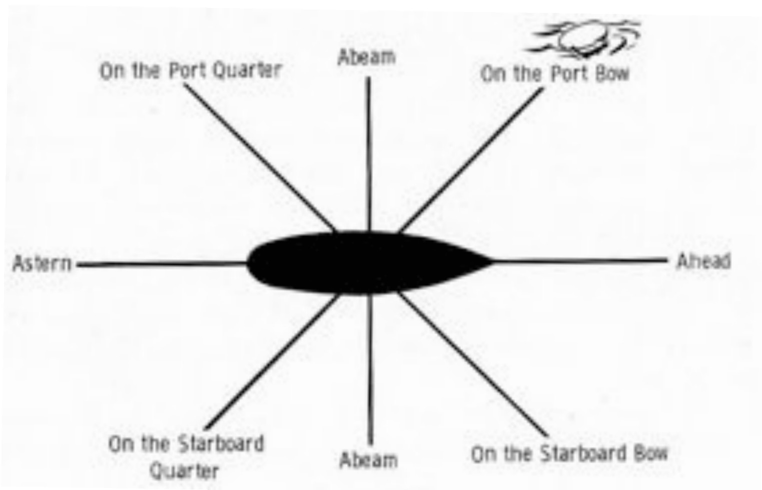


Figure 5-7

a *ladder*, and when you arrive there you are *between decks*. If you take the knife back to the forecastle deck, you have taken it *up top*.

Suppose you now take your cap, go forward and throw it in front of the ship. The cap will be floating *ahead* of the ship. As your cap floats by, it may be said first to be *on the bow*, then *abeam*, then *on the quarter* and finally *astern*.

If your ship is tied to a wharf or jetty, it is said to be secured alongside that wharf or jetty. If you take inboard all

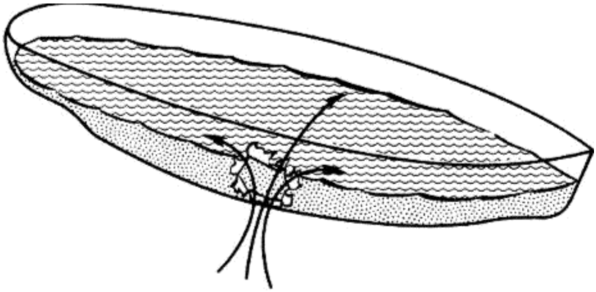


Figure 5-8 No Compartments

the ropes that are securing the ship to the jetty, you would have *let go* the ropes and *slipped* the ship.

The hull of the ship is divided into rooms called *compartments*. The walls of these compartments are called *bulkheads*. Those bulkheads which run across the ship are called *athwortships* or *transverse bulkheads*, and those which run parallel with the centerline are called *fore and aft* or *longitudinal bulkheads*. Besides the fact that different compartments are required to carry different things in a ship, there is another very good reason for dividing the ship up into compartments.

If a hole were made in a ship's bottom and there were no compartments, flooding would soon spread to all parts of the

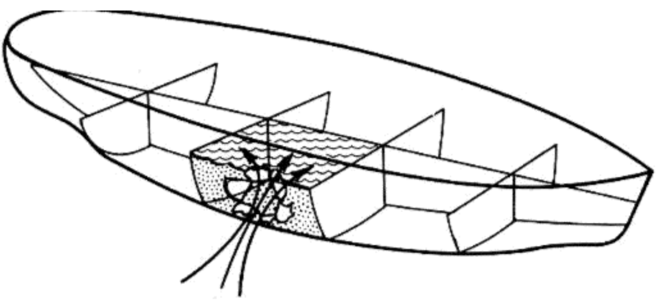


Figure 5-9 With Compartments

hull and the ship would sink quickly. However, if the ship has compartments, the flooding can only spread as far as the bulkheads of the holed compartment and the ship does not sink. Theoretically, if a ship had enough compartments, it would be unsinkable. This cannot be the case, however, because some machinery and gear require large single compartments and because so many bulkheads would be too heavy. Therefore, in every ship there are a certain number of watertight bulkheads, both fore and aft and athwartships. Any further division that is necessary is done with light non-watertight bulkheads.

The allocation of compartments in a ship varies with the class of ship, but it does follow fairly general rules. Figure 5-10 shows how a normal ship is divided.

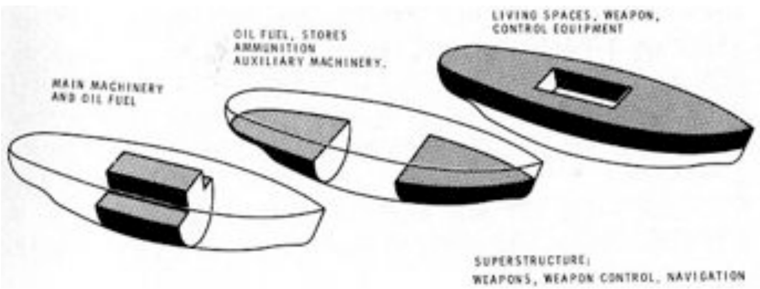


Figure 5-10

MECHANICAL EQUIPMENT

The first steamships were propelled by the use of paddle wheel. The wheels revolved and the paddles on them pushed the ship forward in the same way as a canoe is paddled. The paddle wheels were large and cumbersome and little efficiency was gained.

Eventually, the idea of a screw was conceived. Like most

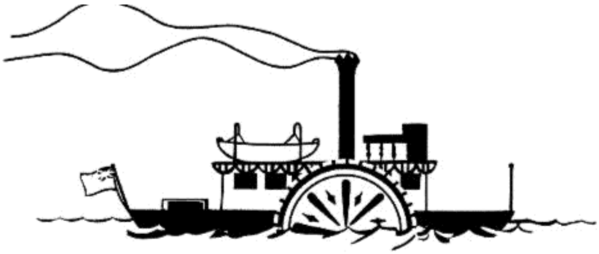


Figure 5-11

good ideas, it was a very simple one. Take a wood screw and drive it into a bench or table with a hammer.

Now if you take a ,crew driver and turn the screw anti-clockwise, you will notice that it pushes both the screw driver and your hand further and further from the bench. Suppose now you take a very large screw and put it in the water attached to the stern of a boat. If you then revolve the screw, it will push the boat in the same way as it pushed your hand.

Scientists worked with this idea until they came to the conclusion that the best screw for use in water was of a different shape from that used in wood. The shape they

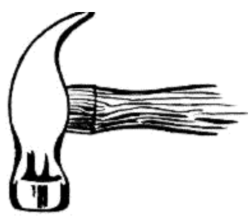


Figure 5-12

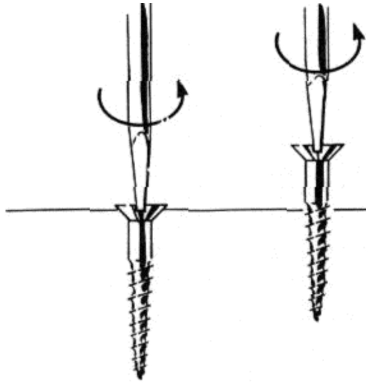


Figure 5-13

decided upon is shown in Figure 5-15. This is the screw used to this day. Most screws nowadays have three or more blades and the shape depends upon whether quietness or speed is the primary requirement, but the principle remains the same.

Now if there is a screw, there must be some method of turning it at a fairly high speed. The machinery used for this

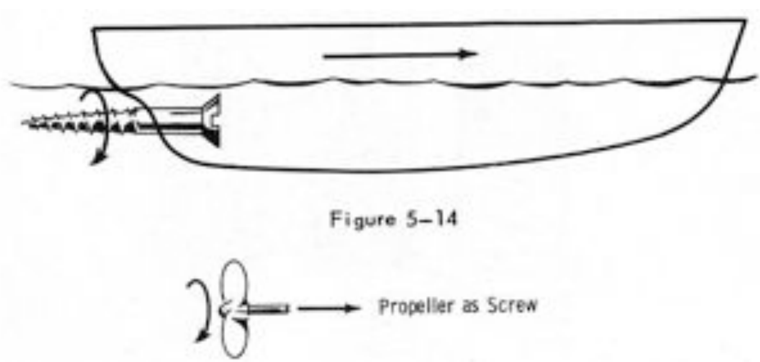


Figure 5-14

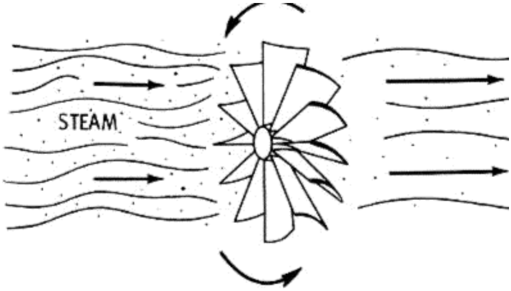


Figure 5-15

purpose is called the *ship's main engines* if they are driven by steam or diesel fuel and *main motors* if they are driven by electricity.

The principle method of driving a surface ship is by use of *turbines*. Oddly enough, the turbine uses the same principle as the screw but in reverse. In this case, steam is passed along.the screw at some velocity and the screw or turbine is caused to turn.

The diesel engine is also in wide use in smaller types of ships and in boats. Basically, the principle of the diesel is

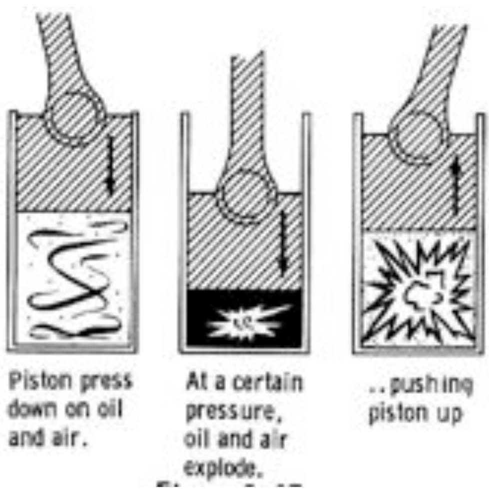


Figure 5-16

that vaporized oil and air at a certain temperature and a certain pressure will explode and thus expand. The energy harnessed from this oil-air explosion is used to turn a screw.

RUDDERS

Your ship with its screw now needs a method of turning to port or starboard because, obviously, you are not going to sail in one direction all of the time. For this, a rudder is used and once again the principle is very simple.

If you sit in a moving boat and place your hand over the side into the water, you immediately feel the water pulling on your hand. The more you turn the palm of your hand into the stream, the more is the pull of the water. If your hand is over the port side, then there is a greater pull back of water on the port side than there is on the starboard side. In other words, the port side is trying to go slower than the starboard side. But since the port and starboard sides are joined together, the only way the port side can go slower is for the ship to turn in a circle to port, and this is exactly what will happen. Try it.

Figure 5–18

Figure 5-19

This is the principle used with a rudder. When the rudder is fore and aft the water slips by it without pulling. But if the rudder pivots to port it makes a pull on the port side and the ship turns to port. Similarly, if it pivots to starboard, the ship turns to starboard.

In ships, a rudder is very heavy and it must be turned by machinery, but a steering wheel is still used to control this machinery.

As you will see later in this book, the Officer of the Watch or the Captain is responsible for conning the ship, and he is therefore responsible for ordering movements of the rudder and screws. In the case of the rudder, the Officer of the Watch on the bridge passes his order to the wheelhouse where the wheel is turned and the steering machinery thus controlled. In the case of the screws, the order is once again passed to the wheelhouse where engine order telegraphs are used to relay the order quickly to the engine room.

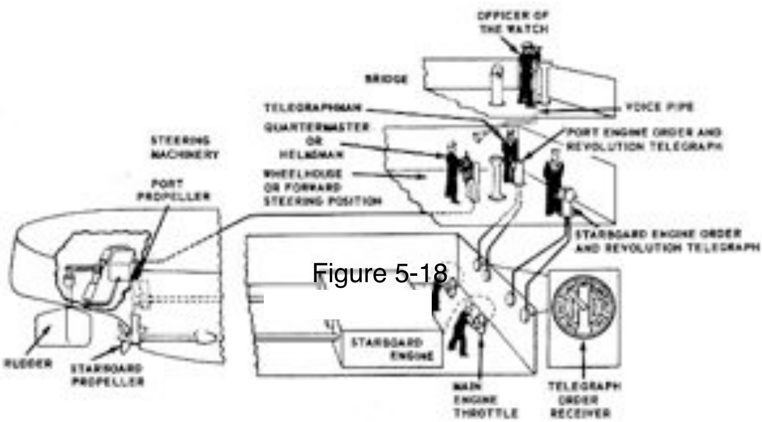


Figure 5-20 How the Rudder and Engines are Controlled

Figure 5-21 HMCS “Bonaventure”

TYPES OF WARSHIPS

We have seen that a ship is a vessel or container which is designed to carry something from place to place. The primary purpose of a warship is to carry weapons into the scene of an action. The ship itself is nothing more nor less than a platform upon which can be mounted varying types of weapons and the equipment for using them. Thus, the type of ship varies

Figure 5-22 A Tracker Antisubmarine Aircraft
About to be Catapulted From the Flight Deck

according to the type of weapon and the method of using it. For example, the aircraft carrier launches aircraft as its weapons and it must therefore be large, fast and with a flat surface, while a submarine, which uses torpedoes, must be small and capable of withstanding underwater pressures.

There are certain qualities which all warships must possess. They must be capable not only of delivering their weapons, but also of receiving the enemies weapons. In other words, they must be able to take some damage from the enemy and still carry on fighting. They must be *seaworthy*. That is, they must be able to operate efficiently in bad weather and rough seas.

A warship must have speed so that it can catch up with an enemy and get into action quickly and it must have endurance so that it can remain in the vicinity of a possible action for long periods of time. l,et us now examine the types of warships used in the RCN.

The Aircraft Carrier

Aircraft carriers range in size from about 8,000 tons to about 45,000 tons. The type used in the Canadian Navy is the “light fleet” class, displacing about 20,000 tons.

The light fleet carrier is some 700 feet in length and has a complement of about 1,200 – It is the largest ship in the RCN.

Aircraft land and fly off from a runway which is at an angle to the centreline. This is so that if an aircraft overshoots, it is clear of the ship. Aircraft are normally catapulted off the flight deck and when they land they are stopped by hooking on to a wire attached to the carrier.

An aircraft carrier has little other protection against the enemy than its aircraft. It is a fast ship, but it need not be particularly maneuverable. It must, however, be stable in order to provide a steady runway for its aircraft.

The aircraft carrier must be a completely self-contained airfield. Besides providing a runway or flight deck for the aircraft, it must provide hanger space, fueling and servicing facilities. Thus, it is a large ship with a broad beam and a high freeboard.

The RCN uses an aircraft carrier mainly in the anti-submarine tole. Anti-submarine aircraft are carried and the ship and its aircraft work in conjunction with antisubmarine escorts. However, the carrier may be used to provide our own ships with air cover or to launch an attack against enemy ships or shore targets.

Destroyer Escorts

The Second World War taught us that we must have a class of ship available that can be produced quickly and cheaply in Canadian shipyards. Early in this war we borrowed the British design of a *patrol vessel*, whaler type. These ships were called *corvettes* and were built and used in large numbers by the RCN. So after the war, work commenced on the design of a ship which would be especially adapted to Canadian needs and which could be built and entirely equipped in Canada. The first of these post war ships, *HMCS ST. LAURENT*, was commissioned in 195S. Since then this class has become the principal ship used in the RCN.

The *St. Laurent Class* and a modernized version called the *Restigouche Class* are known as *destroyer escorts*. They carry the latest antisubmarine detection gear and weapons and are primarily antisubmarine vessels. They displace about 2,900 tons and are some 360 feet in length with a wartime complement of about 240 officers and men.

There are two other classes of destroyer escorts at present in the RCN; the *Tribal Class* and the *Fleet Class*. These are destroyers which were completed during or just after the war. Originally they were designed as fast gunnery ships with a supplementary armament of torpedoes. After the Second World War they were converted into anti-submarine vessels and redesignated destroyer escorts. They are 377 feet in length and displace about 2,000 tons.

Figure 5-23 A Typical Corvette - HMCS “Barrie”

Figure 5-24 HMCS “Restigouche”

Fleet Class - HMCS "Crusader"

Figure 5-25

Tribal Class - HMCS "Haida"

Frigates

A number of frigates were retained in the RCN at the end of the Second World War and these ships, having been modernized, are still in use. The frigate is mainly a long range escort vessel. It is fitted out with modern anti-submarine equipment and weapons and carries twin 4” guns. The frigate is about 300 feet in length and has a complement of some 140 officers and men. It displaces about 2,250 tons.

Minesweepers

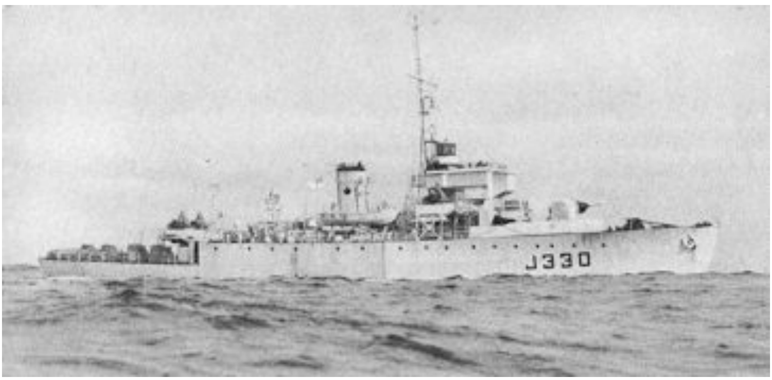
During the war a great number of minesweepers were built. After the war, a small number of *Algerine* and *Bangor Class* vessels were kept in service. For the most part, however, these vessels are now replaced by new-construction coastal minesweepers.

The coastal minesweepers have wooden hulls about 140 feet in length. They displace 370 tons and have a complement of 40 officers and men. They are equipped with the modern navigational and minesweeping gear, have a maximum speed of 15 knots, and an endurance of six working days.

Submarines

The submarine is a very specialized type of ship. Its operation is based upon the principle of *neutral buoyancy*. You have seen a water-logged piece of wood lying submerged in a lake or the sea, and you know that at one time this piece of wood floated. At some time while it was absorbing water, this piece of wood must have reached a stage where it was too light to actually sink and too heavy to actually float. At that stage it would have lingered somewhere between the surface and the bottom and it would have been neutrally buoyant; that is, it had neither *positive* (or *plus*) buoyancy to make it float, nor *negative* (or *minus*) buoyancy to make it sink. The degree of buoyancy in a submarine is known as trim and obtaining the correct buoyancy is called *catching a trim*.

Figure 5-26 Modernized Anti-Submarine Frigate - HMCS “Antigonish”



Algerine Class (Top) and
Figure 5-27 Second World War Minesweepers
Bangor Class (Bottom)

Figure 5-28 Modern Wooden-Hulled Minesweepers Replace WW II Design

The hull of a submarine is cigar shaped and is known as the pressure hull because this is the part which must withstand pressure when the vessel is underwater or dived. Outside the pressure hull are ballast tanks which are filled every time the submarine dives. Inside the submarine are trimming tanks which are filled with sea water to the correct level necessary to catch a trim.

It is not often possible to maintain exact neutral buoyancy in a submarine because of slight changes in weight which

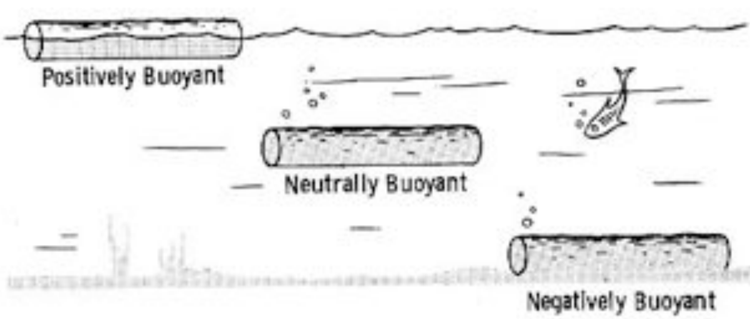


Figure 5-29

occur in operating the vessel and because of slight changes in water conditions which occur. To avoid continuous changing of the level of the trimming tanks, hydroplanes similar to horizontal rudders are fitted. It can be seen that if both sets of hydroplanes are in the up position, movement ahead will force the boat up. See Figure 5-30 (1). Similarly if they are in the down position, movement ahead will force the boat downward.

A submarine surfaces by blowing the water out of its ballast tanks with compressed air.

So that a submarine will slip easily and quietly through the water dived, and so that when it is surfaced it may operate like a surface vessel, a light steel casing in the shape of a

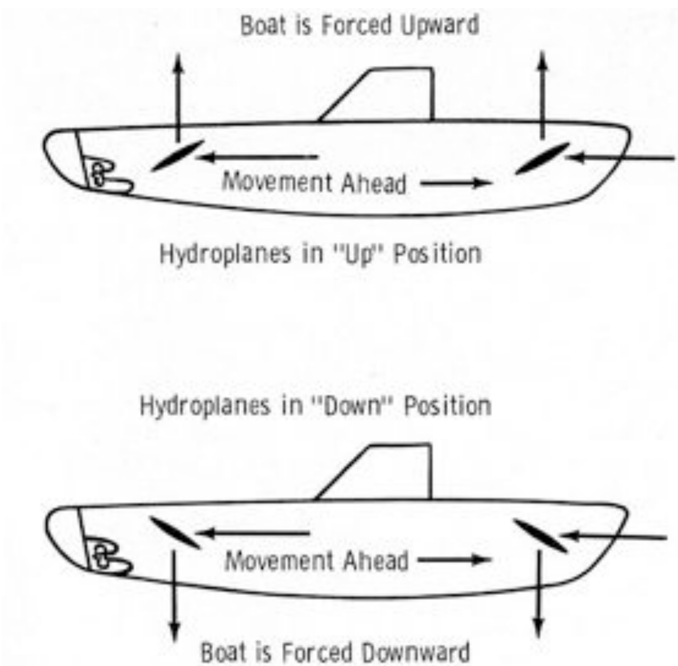


Figure 5-30

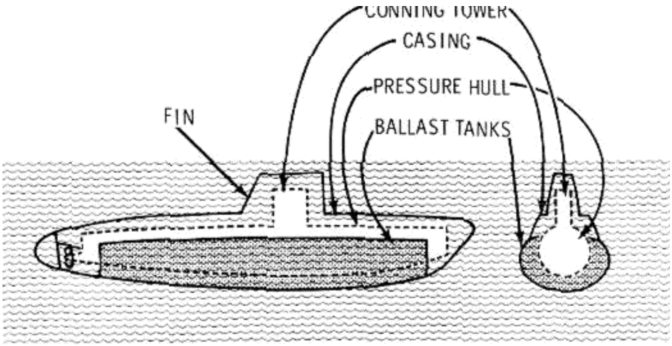


Figure 5-31

surface ship's hull is built around the pressure hull. This casing is "freeflooding;" that is, it is full of holes.

A submarine is propelled by diesel engines when it is on the surface. Because there is no air supply when it is dived, the submarine is propelled by electric motors. The electric motors are run off a battery of the same type as a car battery and the battery is charged by using the diesel engines to run the electric motors reversed thus making them a dynamo. In certain circumstances, a submarine is permitted to use its diesel engines when it is dived. This is done by raising a long pipe called a "snort mast" above the surface of the water and obtaining air through it. This operation is called "snorting".

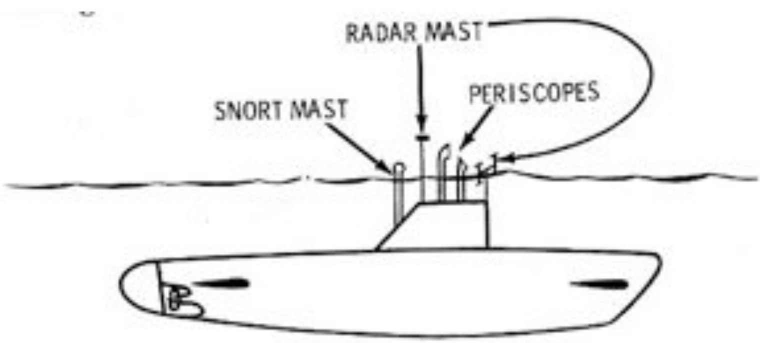


Figure 5-32

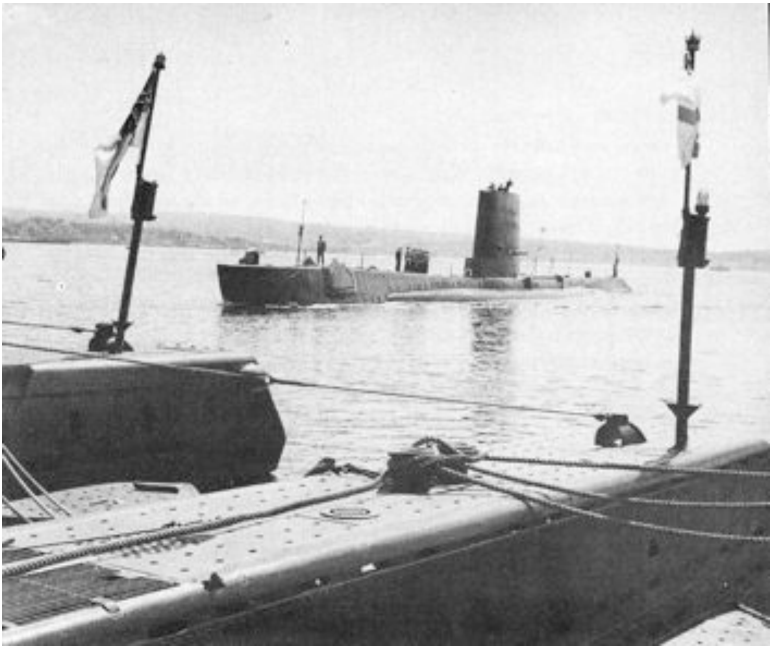


Figure 5-33 A Modernized "A" Class Submarine

When a submarine is dived, it is obviously blind. In order to see where it is going, a periscope is raised above the surface of the water. It is only possible to use a periscope at a very shallow depth. Similarly, radar aerials are raised above the surface of the water and are called radar masts.

The diesel and electric motor submarine must charge its batteries from time to time. It can do this either on the surface or while snorting, but in either case, it becomes an extremely vulnerable target.

A submarine has been developed which is propelled by using nuclear power. This type of vessel has no need to charge batteries and can remain dived for a long period of time. Nuclear submarines are large and costly.

The submarine has many uses. It may be a very effective guided missile carrier because it can sneak up to a suitable range and fire its missiles undetected. It may be used as an effective antisubmarine vessel because it can wait quietly and unseen in an area where enemy submarines are liable to pass. It may be used to hunt down and sink enemy ships. Indeed, in every case where it is undesirable that the enemy be aware of your presence, the submarine is the most effective ship to use.

The principle weapon of a submarine is the torpedo. Special tubes have been designed to fire torpedoes from a great depth under the water. Some submarines are also fitted with guns so that they may engage small vessels on the surface.

The British "A" class submarine is the type used by the RCN. It is 280 feet in length and displaces some 1,500 tons. It has a complement of about 65 officers and men and is armed with six torpedo tubes.

NAVAL AIRCRAFT

First of all, why does an aircraft fly? Consider the propellor driven aircraft. When the propellor turns, the aircraft is driven forward. When the aircraft goes forward, air passes over the surface of the wings, and it is air passing over the

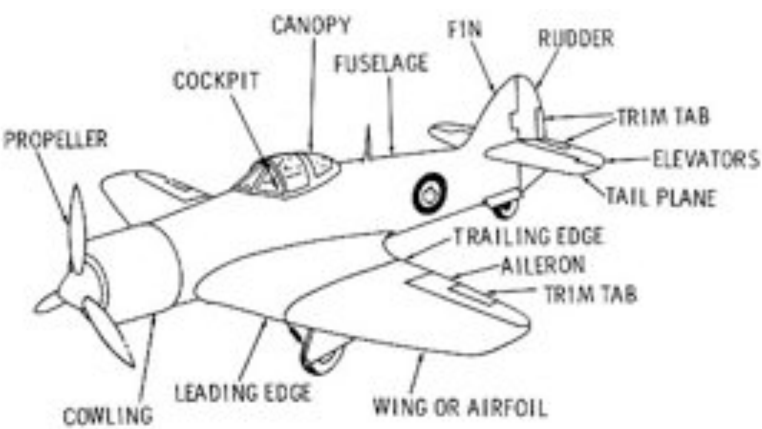


Figure 5-34 Naval Aircraft

Figure 5-35

wing surfaces which causes an aircraft to lift into the air. A wing is shaped roughly like Figure 5-35. It is placed at an angle to the centreline of the fuselage as shown in Figure 5-36. This is called the *angle of attack*. When air is forced along the lower side of the wing, it is impeded by this surface, slows down and produces a greater pressure. When it passes over the upper side of the wing, its speed increases because it has further to go and there is nothing to slow it. Thus, its pressure decreases. Thus, the result is that by having greater air pressure on the bottom side than on the top side the aircraft lifts. This is what makes an aircraft fly.

Climbing or diving is normally done by altering the angle of the aircraft to the horizontal. Elevators are used for this purpose.

With the elevator in the climb position, air passing over it pushes the tail down. Thus the whole aircraft points upward and the propellor thrusts it in this upward direction.

Similarly, with the elevator in the dive position, the tail is forced upward and the nose points down.

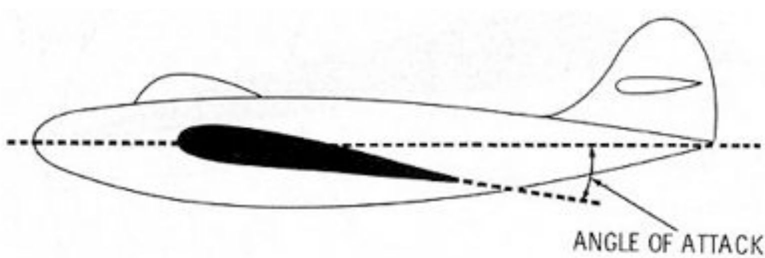


Figure 5-36

Figure 5-37

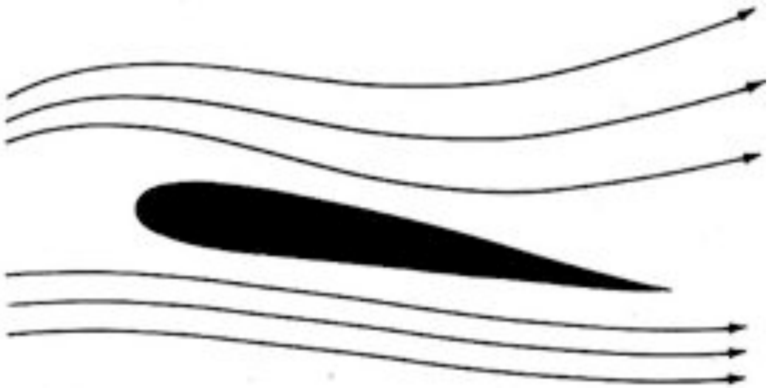


Figure 5-38

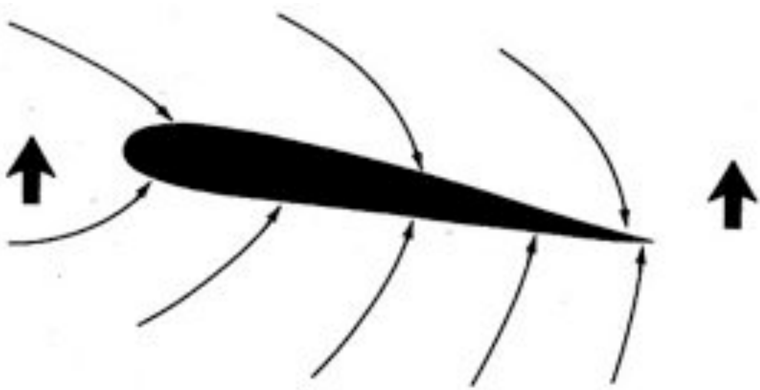


Figure 5-39

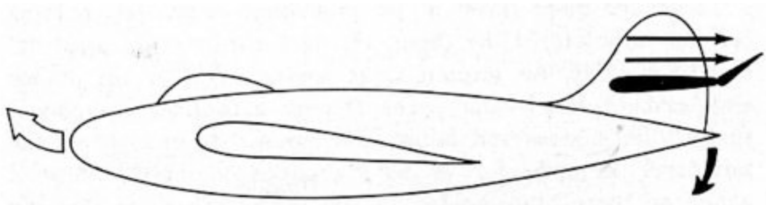


Figure 5-40

Turning is accomplished by a rudder i'n the same way as a ship is turned, but in addition to this, the aircraft is made to heel or bank by the use of ailerons. The aileron on one wing acts like an elevator in the climb position, while that on the other wing is put in the dive position. Thus, one wing is forced down and the other up and the aircraft banks. If an aircraft didn't bank when it turned, it would skid through the air just like i car does in making a turn on a slippery road.

Minor changes in weight or in rigging before the aircraft flies off may cause the nose, the tail or either of the sides to be slightly heavy. This is offset by the use of trimming tabs on the ailerons, the rudder and the elevators. These trimming tabs act just like elevators or hydroplanes; they are put in the correct position to offset discrepancies. The trim tabs on the ailerons are set while the aircraft is on the ground and they are not normally altered in flight. The tabs on the rudder and elevators must be altered each time the aircraft changes speed. This is very similar to catching a trim in a submarine using the hydroplanes. An aircraft is trimmed using its trim tabs.

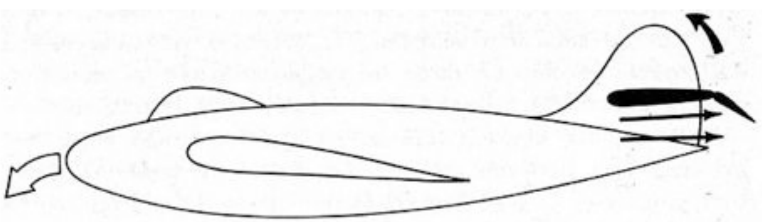


Figure 5-41

Jet Propulsion

There are three types of jet propulsion ram jet, pulsing jet and turbojet. Of the three, the last named is in practical use in aircraft. An aircraft's jet engine takes in air at one end, compresses it and mixes it with a fuel like kerosene, ignites the mixture and allows the exhaust to escape out the tail pipe. When the fuel burns it produces a large volume of gases so there is a greater volume of gases and air leaving the tailpipe than there is air entering through the hole in the nose. This means that the velocity of the exhaust is much greater than the velocity of the air entering.

It is popularly believed that the hot gases from the tail pipe actually push on the atmosphere and force the aircraft ahead. This is all wrong. What actually happens is exactly the same as the recoil from a gun. The bullet in a gun increases speed from nothing to very fast and thus produces a reaction (a force in the opposite direction) in the gun. Similarly, the air entering a jet engine increases speed on leaving the engine as exhaust, and thus produces a reaction which causes the aircraft to move forward. When the aircraft moves fast enough, the air passing across the wing and elevator surfaces causes the aircraft to rise in the same way as with a propellor-driven aircraft.

Helicopters

In the types of aircraft already discussed, the wings are fixed and the air must pass over them relatively. Suppose you leave the air stationary and pass the wing through it. You will get the same lifting effect. Furthermore, since the aircraft doesn't have to move forward to get this effect, it can rise upward from one position. This is the principle of the helicopter. A set of three wings, much like a propellor, rotates above the aircraft and virtually lifts it into the air.

Now suppose you tilt this set of rotating wings until they are half way between the horizontal and the vertical. They will produce a certain amount of the lifting effect, but at the

Figure 5-42

same time they will produce a certain amount of the propellor effect and drive the aircraft forward.

But what about that little propellor at the tail end? Well, why does the engine drive the wings around above the helicopter? Why doesn't it drive the aircraft around beneath the wings? The answer is that it would do both if it wasn't for that little propellor at the tail end keeping the body of the aircraft from rotating.

Aircraft Used in the RCN

You will see the *Grumman Avenger*, nicknamed "Turkey" used in the RCN, but it is no longer used operationally. This is a Second World War carrier aircraft which has been converted to antisubmarine work. With a crew of three, it has an endurance of about four and one-half hours at its cruising speed of 150 knots. It weighs 8 tons.

The Grumman CS2F called the *Tracker*, was the first United States carrier aircraft designed specifically for antisubmarine work. It is modified slightly for use in the RCN. With a crew of four, this aircraft has an endurance of 8 hours and is fitted out with all the modern antisubmarine detection devices.

To provide air cover for our carrier, the Navy uses a single seater all weather fighter called the MacDonnell F2H3 *Banshee*. This is a jet aircraft with two engines inside the fuselage. It has a maximum speed at sea level of 610 knots and can

Figure 5-43 Grumman “Avenger”

Figure 5-44 Grumman CS2F “Tracker”

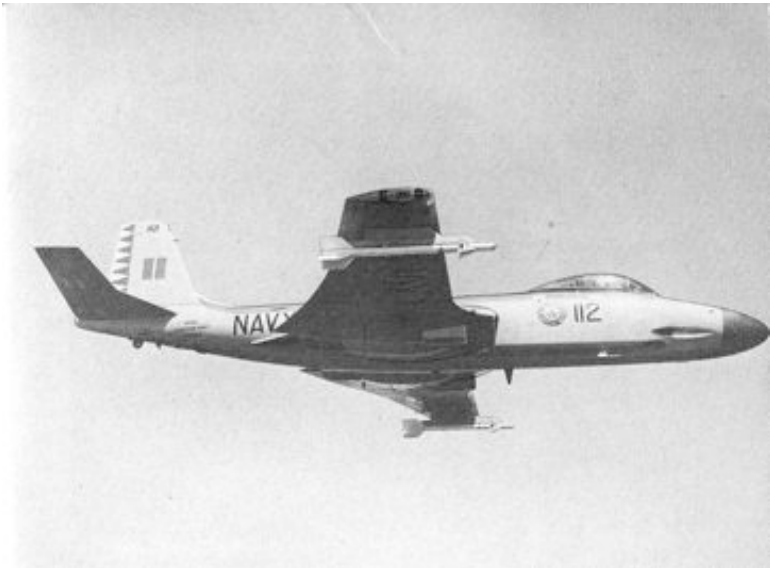


Figure 5-45 McDonnell F2H3 “Banshee”

Figure 5-46 Sikorsky S55 Helicopter

climb at an initial rate of 9,000 feet a minute. It can carry cannons, rockets or missiles.

The helicopter in general use in the Navy is the *H04S Sikorsky s-55*. It is used for search and rescue work or for antisubmarine work with a sonar set (on the end of a long line) which it dunks into the sea. It is used with a crew of three, has a cruising speed of 85 knots and a range of 290 miles. Its weight is just over 3 tons, loaded.

Maritime Aircraft

In addition to naval aircraft, the RCN quite often works in conjunction with the RCAF, so it is as well to know something about the aircraft which the RCAF uses in antisubmarine work.

The *Neptune*, P2V7, has a crew of 10 and an endurance of 18 hours. It cruises at 160 knots and weighs about 36 tons, loaded.

The *Canadair Argus*, CL28, which is a modified *Bristol Britannia*, carries a crew of 15 and has an endurance of over 22 hours. It cruises at 175 knots and weighs 75 tons. This aircraft has the facilities for the crew to live in it and run a watch routine.

The Use of Aircraft in Anti-Submarine Work

Suppose an enemy submarine is snorting along, charging its batteries and looking for a target to attack. An antisubmarine ship steams up over the horizon at 15 knots in search of this submarine. Now the enemy submariner hears the ship's radar through an electronic device and actually sees the antisubmarine vessel long before the ship can possibly have any contact. (Submarines do not as a rule make much use of radar unless they have to.) Thus, the enemy submarine captain has plenty of time to get out of the ship's way.

But suppose it is an aircraft doing 150 knots which comes over the horizon. The enemy submarine will be lucky to have stopped snorting and have dived deeper before the aircraft has detected him. An aircraft makes a far more efficient

Figure 5-47 "Neptune" P2V-7

Figure 5-48 Canadair Argus CL28

antisubmarine search unit than a ship. The mere presence of an aircraft will keep a submarine too deep to use its periscopes, radar or to charge its batteries. Let us follow the story a little further. What does the aircraft do now that it has detected the submarine? Gaining contact with the submarine is the most important part of all antisubmarine operations. Normally, an aircraft making an initial detection of this type, carries out an immediate attack, using depth bombs or homing torpedoes. In addition, to ensure that the submarine is destroyed, the aircraft usually drops a pattern of sonobuoys (small floating hydrophones which transmit to the aircraft any sound made by the submarine). Should the first attack by the aircraft not be completely successful, the crew of the aircraft can, by use of these sonobuoys, maintain contact with the submarine until either additional weapons can be launched or a surface ship directed to the area to complete destruction.

QUIZ

1. What is the difference between a boat and a ship?
2. What are the directions in a ship?
3. What are the directions outside a ship?
4. Why are there watertight compartments in a ship?
5. Explain the principle behind the screw.
6. Explain how a rudder works.
7. What qualities must a warship have?
8. What are the types of ships used in the RCN today, and what do they do?
9. What is neutral buoyancy?
10. Very briefly, explain how an aircraft flies.

11. What are the aircraft used in the RCN, and what do they do?
12. How does an aircraft work with a ship in an anti-submarine operation?

The answers to these questions may be found in Chapter 5.

CHAPTER 6

SHIP MAINTENANCE

Second hand car lots contain a wide variety of cars for a wide variety of prices. Let us visit one of these places now. We look through the list of cars available and find a 5 year old car priced at $800. A little further down we see another 5 year old car of the same make and model with the same fittings and accessories, but it only costs $250. Why?

Let us look at each of the cars . . . first of all, the $250 model. We notice that the tires are worn smooth; there are little rust patches appearing in the paintwork; an old dent that has never been repaired is beginning to rust over. We lift the hood and find that the battery is covered with a white substance; the spark plugs look old; the engine block has a light coat of rust; and there is no radiator cap. We look through the windows and see that the upholstery is tattered. We try to open the door and the handle comes off in our hand.

Now let us see the $800 model. We notice that the paintwork is good it is the original paint and has a high polish; the tires are not new, but they have a good tread; we notice that a small dent in the fender has been straightened and repaired. We lift the hood and see that while nothing is new, it is at least clean and well kept. We open the door and see that the seats are covered, and lifting the covers we find the upholstery in new condition.

Figure 6-1

What has happened? The answer is simple. One owner has maintained his car and the other has not. One of the cars would be quite reliable on the road, the other would not. If you had to brake suddenly and then speed up quickly to avoid an accident, which car would you rather be driving?

The Navy's ships must be ready to go to sea at very short notice, to perform some astonishing feats of speed and maneuvering, to fire all of their weapons, to sustain serious damage, and still to come back ready for another such voyage. It is not too difficult to understand, then, that the Naval vessel must be constantly maintained, and maintained well.

Every small bit and piece of fitting or equipment in a warship is there for a purpose. It may not be used every day; it may seldom be used; but when the time comes to use it, it will come suddenly, and suddenly that bit or piece of equipment will assume an importance out of all proportion to its size. It is necessary then that every part of the warship be maintained in an efficiently workable condition.

A good deal of the maintenance in a ship is done by experts. Everyone is not expected to know the intricacies of the main engines or a radar set. But an even larger proportion of this maintenance is the responsibility of every person in the ship. Remember the dents in the $250 car? the broken windows? the door handle which came off? the rust spots? It did not take an expert to cope with these. Similarly, the general maintenance in the ship is done by people of all trades.

PAINTING

There is a saying in the Navy: "If it moves, salute it; if it doesn't move, pick it up; if you can't pick it up, paint it! "

Paint it . . . . the first and perhaps the largest single routine maintenance is painting; but there is more to the business of painting than just a brush and an old coffee tin full of paint.

When bare steel is exposed to air or water it rusts. Rust is nothing more than oxygen from the air or water acting chemically with the metal and producing the substance rust. In every case of rusting, some of the metal is used up, so that if a piece of iron is allowed to rust long enough, eventually all the metal will be reduced to rust. Rusting is prevented by stopping air or water from getting at the metal. To do this, the metal is painted.

First of all it must be decided where to paint. You look about you and see a really bad looking bulkhead. You run your fingers along this bulkhead, and you have to go and wash your hands. just for the sake of curiosity you take a bucket of water and some detergent from stores and you wash the bulkhead down. Behold! Underneath the dirt, the paint is as good as new Rule number 1: Never paint over a dirty or greasy surface.

Even if the paint under the dirt was not good, a coat of paint will not last if applied over a coat of dirt.

You look about you, and see a bulkhead where the paint is flaking off and little rust patches are appearing. This is it, you decide, so you rush over with your paint pot and slap on a coat

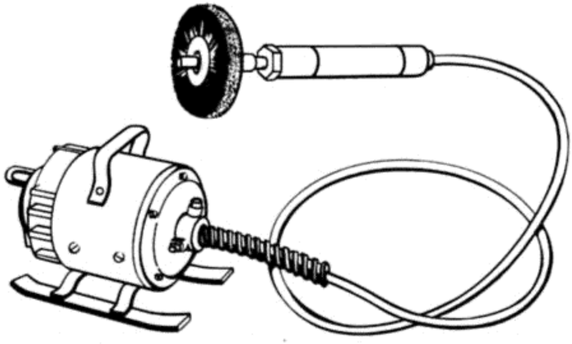


Figure 6-2 Power Driven Wire Brush

In two weeks time, the rust spots have reappeared and the new paint is beginning to flake off. What was wrong? Rule number 2: Never paint over a corroded surface. Be sure that all corrosion, rust, scale, loose or flaking paint, salt spray, or wax are removed.

Apparently there is more to this painting than meets the eye. How is the surface to be prepared?

First of all, using a power driven wire brush, rotary chipping tool, or hand chipping tool remove the corroded or rusted areas down to bare steel. Then remove any rust stains on good paint with varsol and steel wool from boatswain stores. Remove any grease or oil with varsol. Now "feather the edges" of good paint where it meets the bare steel. That is, smooth down the edge of the good paint with your buffing tool.

Now treat the bare patches of steel with a 5% phosphoric acid solution which you will draw from the boatswain stores.

Figure 6-3

When this is dry, brush off the salt that will be left.

At last, you are ready to do some painting. If the surface is inside, just apply one coat of primer paint to the bare metal surfaces. If it is outside, apply two coats of primer and two coats of the finish paint to the bare metal surfaces. Allow each coat to dry before the next is applied.

Now you wash the whole bulkhead down with a special detergent which you can draw from boatswain stores. When this is done, rinse the whole bulkhead with fresh water. Allow surface to dry thoroughly, and then apply the finish coat to the whole bulkhead.

What would happen if you painted the bulkhead while it was still damp from washing? Blisters would form in the paint when it dried. Rule number 3: Never paint over a damp or wet surface.

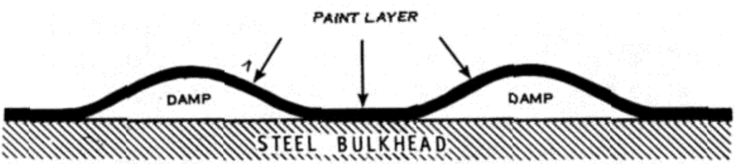


Figure 6-4

The paint used in the RCN is not just ordinary paint. It gives much better protection than the paint you will find sold in the department store, and it retards the action of fire. Scientists have done many years of research to produce this paint, and they have laid down some further rules about its use.

Rule number 4: Never prepare the surfaces in any other way than that which is outlined above.

Rule number 5: Never use any but the authorized type of paint.

Rule number 6: Never thin paint except with the authorized type of thinner (varsol)

Rule number 7: Never paint if the temperature is below freezing, and do not paint unless absolutely necessary if the temperature is below 50°.

Rule number 8: Wash paintwork often, but only with the authorized type of detergent.

Here are the more common terms used in painting and their meanings:

Primer: is the first or base coat of paint. It is usually of a different type from the other coats.

Finish coat: the final coat of paint.

Thinners: the liquid used to thin paint when it is too thick for brushing or spraying.

Application of Paint

Paint is applied in three ways in the Navy. It may be spread with a brush, sprayed or rolled on.

Brushing brushes are used if the area to be painted is too small to bother setting up a spray or too complicated for a roller to deal with. Brushes are always used for first coats of primers, and always in compartments containing electronic equipment (spray mist damages electronic equipment).

The first thing to do is select the right brush for the right job. Service flat brushes come in sizes from one to four inches, and sash tools, which are oval shaped in sizes 2, 4, 6, and

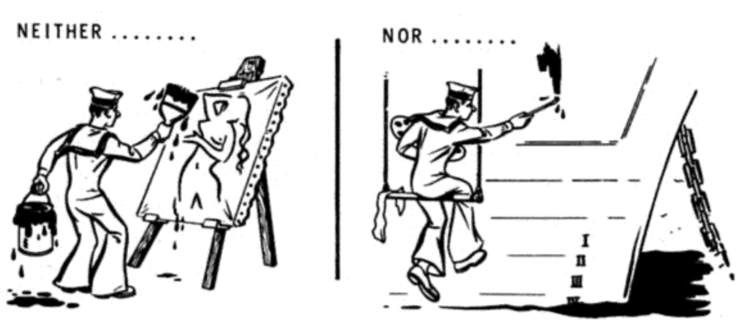


Figure 6-5 The Right Size Tool for the Right Job

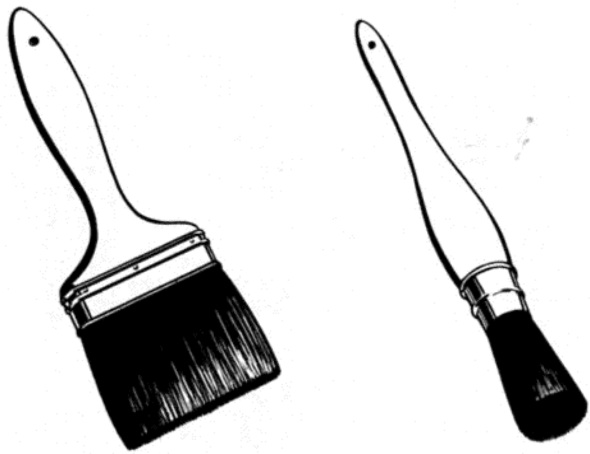


Figure 6-6

8; number 8 being the largest size (1½ inches). Others are smaller corresponding to smaller size numbers.
Hold the brush firmly but lightly above the ferrule; work the paint well into the brush at the beginning, and then dip the brush about 2 inches into the paint, tap it lightly on the side of the tin, and carry it to the surface to be painted. Make strokes firmly and smoothly. Do not press too hard, but, on the other hand, do not let the brush float across the surface. Never pound, daub, or force a brush into corners.

You will undoubtedly see others breaking these rules. Pay no attention to them unless they are your juniors, then show them the correct way.

Rollers

Rollers are used on large, flat surfaces, such as a ship's side, when it is not too pitted or marked. The advantage of the roller is that it is fast, it spreads a perfectly even coat, and, fitted with a long handle, it may avoid the use of stagings.

Rollers come in 7 and 9 inch sizes complete with corresponding trays.

Before rolling, you must paint the corners and any other

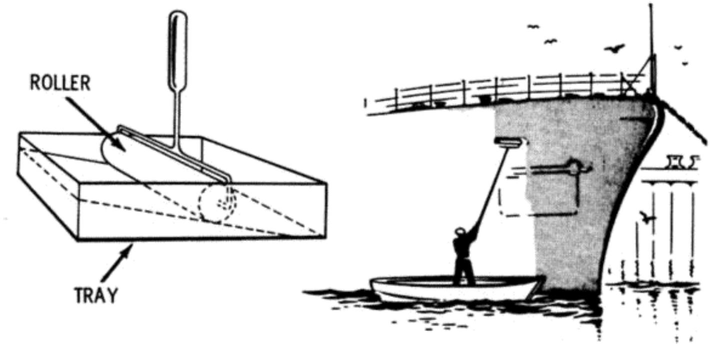


Figure 6-7

inaccessible edges with a brush up to about 3 inches from the edge. These are the places the roller can’t get at.

Make sure that your paint is well mixed, and then pour it into the tray up to the point marked by the manufacturer. Make sure the roller is completely covered with paint, and remove excess by running the roller up and down the high side of the tray a couple of times. Now commence rolling the paint on in one yard strokes, starting in the dry area and finishing where you have painted before. It is as simple as that.

The very important point to watch is that any places where the surface is not flat e.g., rivet heads, fittings and so on have been brush painted before hand. The roller is only good for the flat surfaces.

Spray Painting

Unlike the brush or the roller, the spray painting gun is a precision-built tool. It should be treated with great care. When it is used properly, the spray gun will give quicker, better, and more economical results than the brush.

The basic equipment of the spray painter consists of: a gun, an air regulator or transformer, a paint container or pressure feed tank, a compressor, and connecting pipes and hoses. The compressor takes air from the atmosphere, compresses

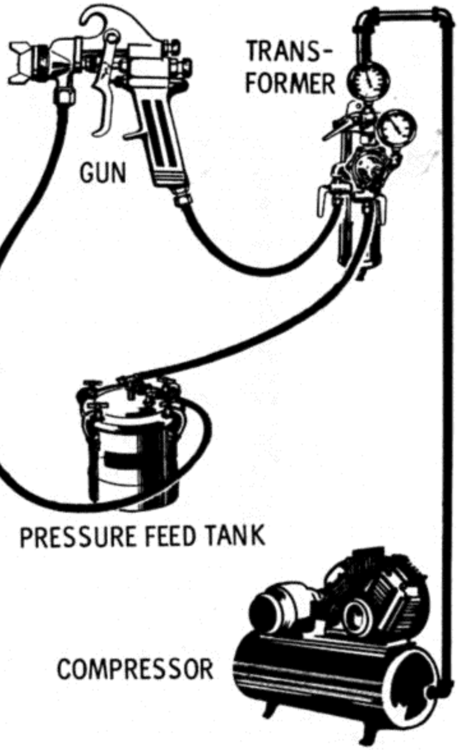


Figure 6-8 Spray Painting Equipment

it, and supplies the air pressure needed to operate the gun. On its way to the gun, the compressed air goes through the transformer where the dirt, rust, oil or moisture that might be in it is removed. In addition to removing the dirt, the transformer regulates the air pressure needed to operate the gun. The pressure feed tank supplies the paint to the gun.

The heart of the equipment is the gun. When the trigger is pulled, the paint and air streams come together, and the air breaks up or "atomizes" the paint into a fine spray.

The spray method is used in most large jobs in a ship. However, it may not be used in any compartments containing

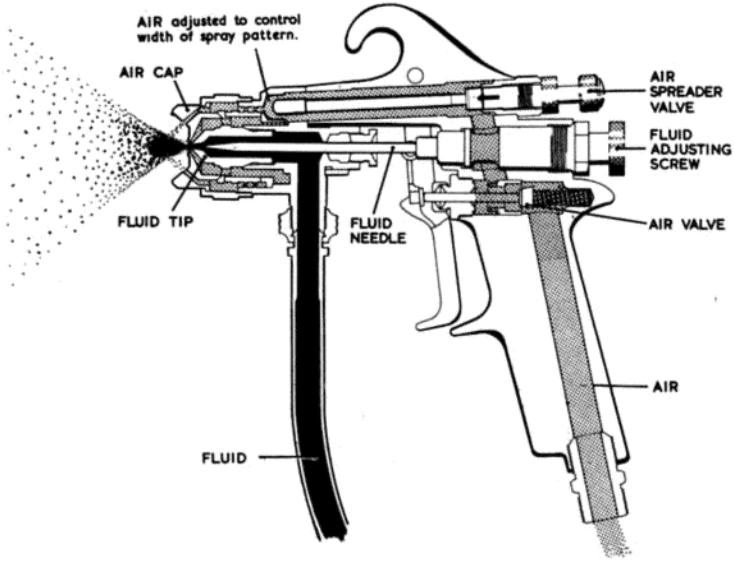


Figure 6-9

electronic equipment. This is because a small portion of the paint forms a very fine mist which may settle on delicate pieces of equipment and damage them.

Generally, the first coat of paint on bare metal is brushed. This is because brushing makes the paint "adhere" or stick to the surface better.

In preparing to spray paint a compartment, there are a number of precautions to be taken. Any electrical machinery should be protected from the fine spray, and all ventilation fittings should be covered over with tape.

The paint itself should be of the same consistency you would want for brush painting. Do not thin the paint down to a watery consistency. Always strain the paint into the paint container. You may draw a wire screen or cheesecloth from bos'ns stores for this purpose.

Finally, draw a face mask from the paint locker. These are

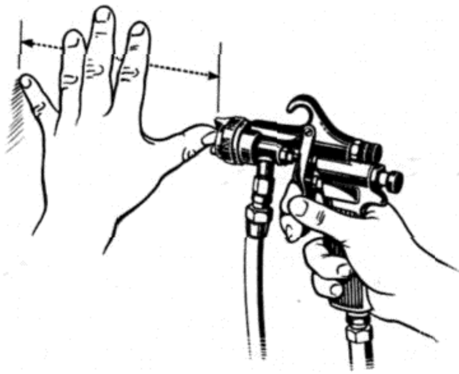


Figure 6-10

worn over the nose and mouth and remove the particles of paint from the atmosphere. It's the bulkhead you want to paint not the inside of your lungs.

The actual painting is an art. Normally a good brush painter will also be a good spray painter. The gun is held about the width of a handspread from the surface to be painted. Then, using the whole arm, the gun is run along parallel to the surface. Do not move the gun in an arc.

As in baseball or golf, a follow through is necessary. The gun should be moving before the trigger is pulled, and should continue to move after the trigger is let off. Always overlap half of the last stroke by pointing the gun at the bottom of the previous stroke.

A good deal of practice and study is necessary before you

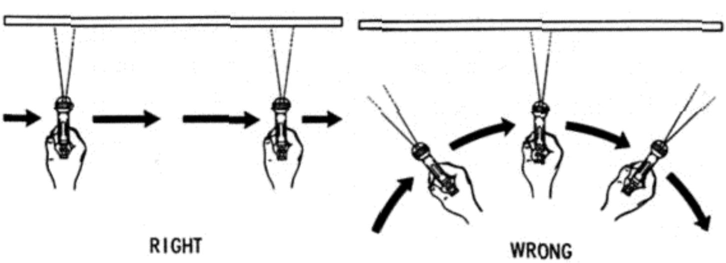


Figure 6-11

become a good spray painter. Do not attempt to spray for the first time without the help of someone with the knowhow.

Care of Equipment

Painting equipment, like a car, needs to be well cared for if it is to function properly.

Brushes

It is a peculiar thing that the type of paint brush used, its cost and availability, has in the past and still does depend
to a large extent on the evolution of the pig family. The hair of the hog makes the only really satisfactory bristles ever discovered for paint brushes. However, in North America, hogs have been bred primarily for food, and their coats have gone to ruin. Nowadays the only really decent bristles come from swine bred in the Far East and Russia, and these are, needless to say, rather hard to come by.

However, the Navy holds that the best work is done using the best tools, so most brushes you will use are genuine hog's bristle and are very costly. Each time you use a paint brush, think of these poor swine who are living in places and under conditions which you will never see . . . treat your paint brush with the care and respect it deserves.

Brushes should never be kept in water. When you finish work, you should hang the brush in linseed oil and turpentine about 2 inches from the bottom of a container. Cover the bristles, but not the ferrule.

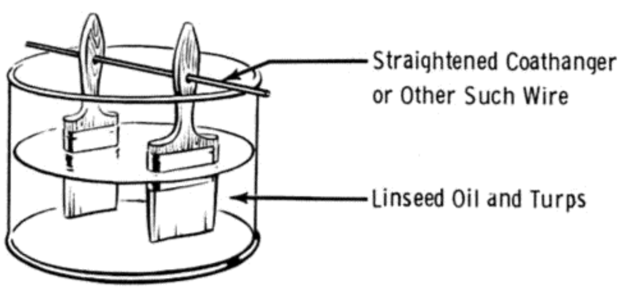


Figure 6-12 The Proper Way to Stow Point Brushes Temporarily

Never rest the brush on the bottom of the container because this will cause the bristles to bend, and permanent damage may be done. When you come to use the brush again, merely take it from the container and remove the oil by washing it in a pot of varsol. It is very important that all the oil be removed if the brush is to be used for a fire retardant paint.

Rollers

Rollers have spun nylon (Dynel) covers, and are very easily kept clean. It is only a matter of putting solvent, instead of paint, in the tray and running the roller up and down the tray, changing the solvent as it becomes coloured, until the fabric is clean. Then wash with soap and water and rinse until clean.

If rollers are not cleaned they become clogged with partially dry paint and they will make an uneven coat.

Spray Equipment

Do not attempt to clean spray equipment until you understand the functioning of every piece. Then it should be cleaned according to the handbook that accompanies it. However, there are a few general rules which must be remembered.

1. Always stop working a half hour before secure, and spend that half hour cleaning the equipment.
2. Never dip the gun in a solvent.
3. On completion of cleaning, always oil the moving parts and packings in the gun.

GREASING AND LUBRICATING

Another method of keeping air from metal is by applying grease. There are many pieces of equipment in a ship which may not be painted because paint would impair their use, or because they are used in such a way that paint would simply wear off very quickly. Examples of this type of equipment are steel-wire rope hawsers and upper deck gun mountings. Grease or oil is applied to this type of equipment as a protective coating.

The normal use of grease and oil is as a lubricant. If you rub two pieces of metal together you will notice that eventually they will wear down. You will also notice that if any pressure is applied, the pieces of metal become more difficult to rub together. Also if rubbed hard and long they become very hot. Now put a little grease between the pieces. You will notice that as long as the grease is there, the pieces of metal do not wear down, and no matter how much pressure you apply, they slip on each other easily. Why? When you first rubbed the pieces of metal together the metal of one was actually making contact with that of the other. However, when you put in grease, a very thin coat of it clung to the surfaces.

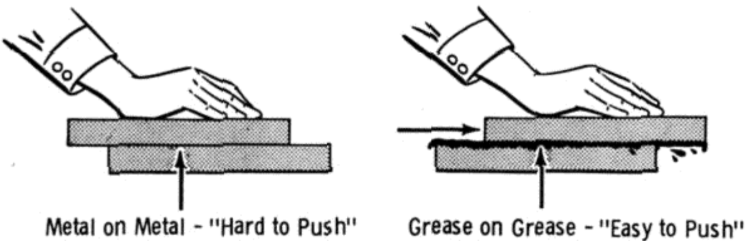


Figure 6-13

Thus it was grease rubbing on grease, and not metal on metal. If you have ever tried to catch a greased pig or walk a greased pole, you will know that grease is slippery, much more slippery than steel.

It is easy to see then that, by lubricating, four things are accomplished: moving parts are prevented from wearing each other; moving parts are made easier to work; damaging heat is prevented; and the metal is prevented from rusting.

Most lubrication in the ship is the responsibility of seamen in the engineering trades, but some of it must be done by men of all trades. In the place where you work, or the place where you live, it is up to you to see that everything that should work does work. For example, the clips on the door of a compartment need a little oil on them quite frequently. The hinge on a scuttle or deadlight needs oil as do the myriad of work

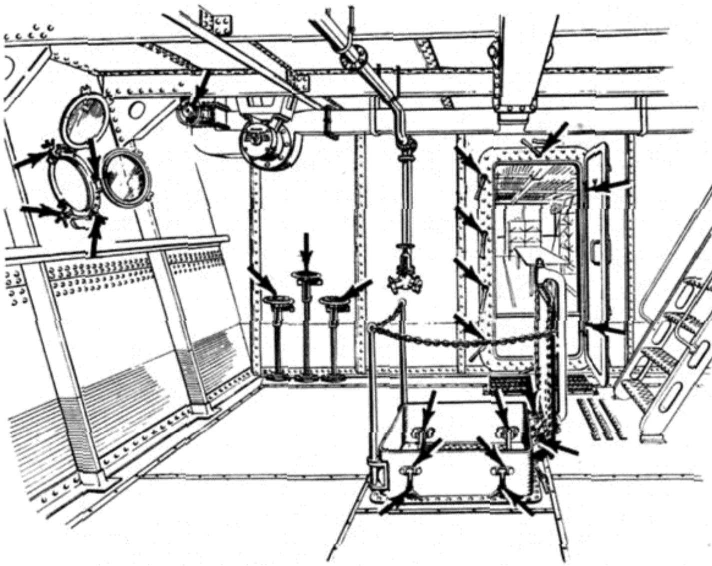


Figure 6-14 The Arrows in this Typical Compartment Show a Few of the Places Which Need Frequent Oiling.

ing parts in every compartment in a ship.

Remember, someday, perhaps tomorrow, your life may depend upon how well any one of these little things work. It is worth while to make sure they do work.

CLEANLINESS

A seaman is not long in the Navy before he hears a conversation that goes like this: "I hear (such and such a ship) has broken down at sea."

"Oh, that dirty old garbage scow; I'm not surprised!"

And why not surprised? Because it follows, and always has followed, that a dirty ship is an inefficient and poorly maintained one. There is a good reason for this. Dirt leads to corrosion, hides defects, and impairs the working of moving parts. The functioning of a ship and its cleanliness always go hand in hand. Perhaps the most efficiently functional piece of equipment in the Navy is an aircraft, and you will never see a dirty operational aircraft. It is too dangerous.

Scrubbing and polishing, scraping and cleaning, are as traditionally a part of the Navy as your uniform. Every officer and man has had to do these things at some time in his career. However dull they are to do, they are jobs which must be done well because a slipshod job stands out like a sore thumb.

Once again, a great deal of the business of keeping a ship clean is the responsibility of everyone in the ship.

HAND TOOLS

It may seem ridiculous to tell a young man that a screw driver is used for turning screws or that pliers are used for holding objects. Yet how many times have you used a screw driver to pry open a packing case? or a pair of pliers to turn a nut?

In the home workshop some tools have to do jobs for which they weren't intended; you can't afford to have all the tools you might like to have. But in the Navy the correct tools are provided for every job. The Navy cannot afford to have people using the wrong tools because both the tools and the equipment stand to be damaged. The smallest, cheapest bit of equipment in a ship is far too important to be damaged by a careless choice of tools.

If you are ever unsure about which tool to use, ask someone more experienced than yourself. Your job in the Navy is too vital to be done poorly.

Tools are expensive. The Navy makes sure that its Seamen have good tools to work with because the Navy must have good ships. But, however good a tool may be, if you abuse it or use it carelessly, it will be damaged and soon become useless; and, if you are at sea, you may find it a long time before damaged tools can be replaced.

Put tools away properly after you have used them. If the ship rolls, a tool left lying about may easily fall and be damaged. A sharp tool left lying about may injure somebody even yourself. Also, when tools are left lying about they invariable get lost.

Figure 6-15 “What Could I Have Done With That Small Screwdriver”

Keep your workbench tidy. It is a proven fact that the best workman in the world can do no more than a second rate job on an untidy workbench. Once again, when the ship rolls, an untidy workbench will scatter tools all over the deck.

Do not carry sharp tools or precision tools in your pocket. A sharp tool in a hip pocket may cut something it was never intended to cut, and precision tools just can’t stand up to a beating.

Be continually on guard against dirt or rust in tools. They will ruin a tool as quickly as any other type of misuse. If you use a tool, know how to keep it in good condition. Tools need maintenance just as cars and ships do. Don't leave it for the next fellow.

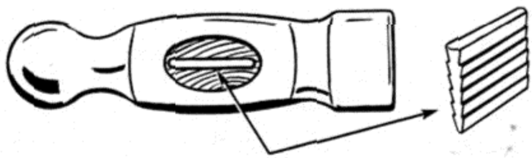
Hammers

There are many special types of hammers used for special jobs, but the hammers you are most likely to encounter are the "ballpeen" or "machinists" hammer, and the "claw" or "nail" hammer. The ballpeen hammer is used in working with metal, that is, for driving rivets, pounding punches or cold chisels and so on. The nail hammer should be used for driving nails and only that. The claw attachment may be used for withdrawing nails.

Grip the handle close to the end and swing using the whole forearm. This will make a harder, squarer blow.

Figure 6-16

Make sure that the head of the hammer is always well fastened to the handle. Many serious accidents have happened when hammer heads have come away and hit somebody. There should be a corrugated steel wedge in the head end of the handle which expands the wood and holds the head on firmly.



Corrugated Steel Wedge
Figure 6-17

Pick the right sized hammer for the job you need, and give it a coating of light oil occasionally to prevent rusting.

Screwdrivers

There are two types of screwdriver in use today. The standard type has a flat, specially hardened bit which comes in a good variety of sizes.

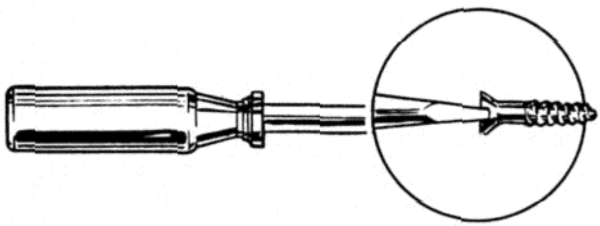


Figure 6-18 Standard Type

The Phillips' type is designed especially for the Phillips' type screw. It comes in three sizes which will fit all sizes of Phillips' screws.

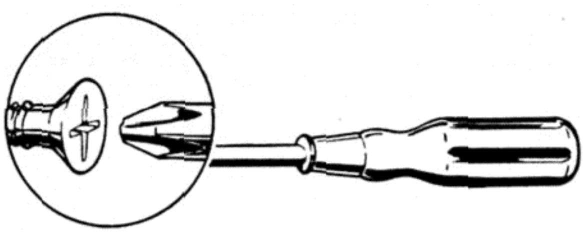


Figure 6-19 Phillips Type

It is most important that you select the right sized screwdriver. One that is too small is liable to break, and one that is too large is liable to damage the head of the screw. Do not use an ordinary type screwdriver on a Phillips' type screw. A screwdriver may be used for driving screws and NOTHING ELSE.

Pliers

Pliers are a fine utility tool. They come in a wide variety of shapes and sizes. The most common type is the *combination*. They may be used for holding or bending metal stock, and they have an attachment for cutting wire. Pliers should not be

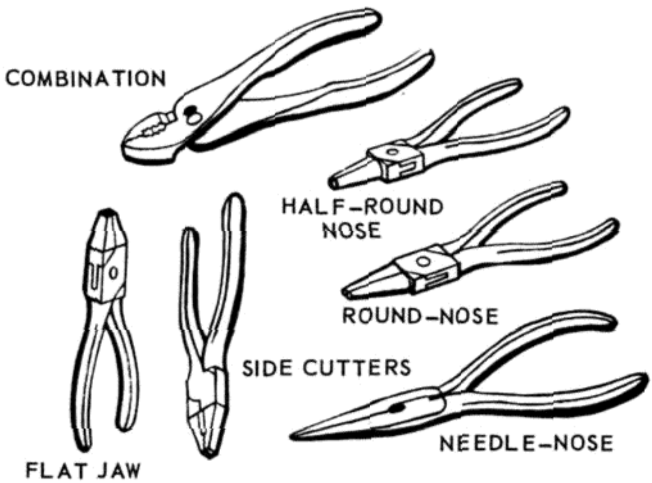


Figure 6-20 Pliers

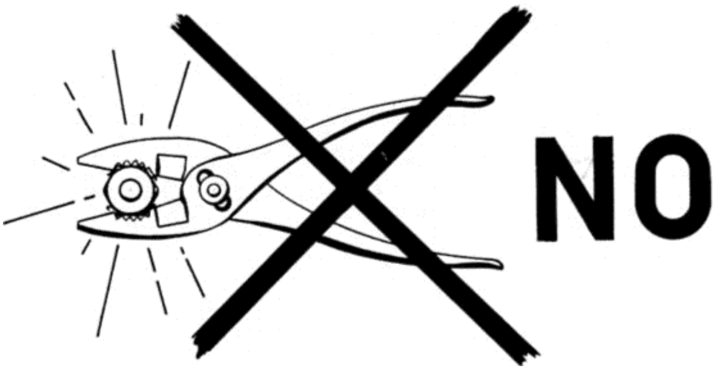


Figure 6-21

used **for** very heavy work; the jaws will spring or break. Above all, **PLIERS ARE NOT TO BE USED FOR TURNING NUTS.**

Hacksaws

The hacksaw is used for cutting metal. It consists of an adjustable frame, a blade, and a handle. Always fit the blade so that the teeth are pointing *down* from the handle, and always choose a blade with a sufficient number of teeth per inch so that the saw won't jam (see Figure 6-23) and break a tooth.

When using a hacksaw, all the pressure goes on the forward stroke and none on the back stroke. The whole length of the blade should be made to run across the metal; otherwise, the middle will get hot and the teeth wear down unevenly. Do not

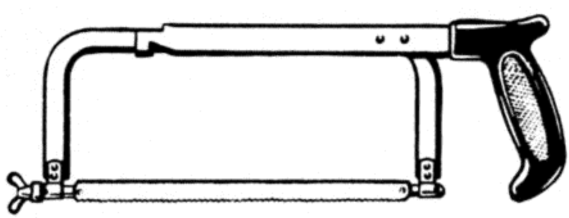


Figure 6-22 Hacksaw

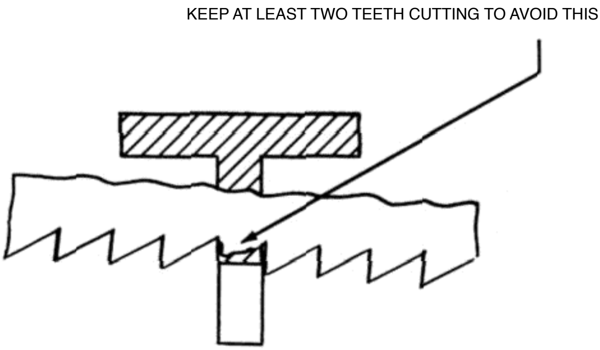


Figure 6-23

try to saw too fast. If you take your time with a hacksaw the work will be done more quickly and with the least effort.

When you are finished using a hacksaw, clean any chips out of the teeth and loosen the tension on the blade.

Wrenches

The two main types of general use wrenches are the *nonadjustable open-end wrench*, and the *adjustable open-end* wrench. Even among these two types there are many varieties and sizes.

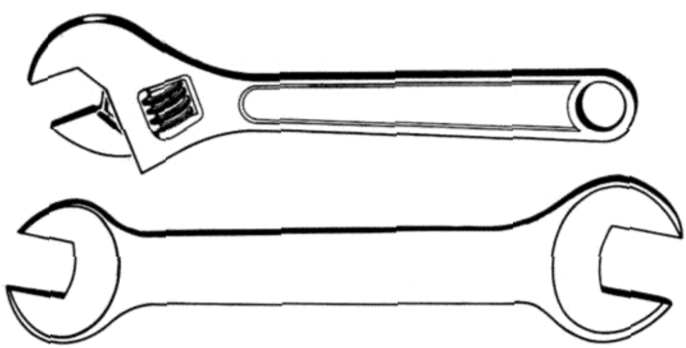


Figure 6-24 Adjustable and Nonadjustable Open-End Wrenches

Figure 6-25 Pull on the Side of the Handle With the Fixed Jaw

Before attempting to turn with a wrench, make sure the wrench jaws *fit* the nut or bolt head. If the wrench is a bit too large, the sharp edges of the nut or bolt head will become rounded, and you will be lucky to get the bolt out at all.

When you come to turn; *pull*, do not *push*. With an adjustable open end wrench, exert the force on the side of the handle with the fixed jaw. This will prevent damage to the movable jaw. When tightening a nut Qr bolt only turn the wrench until it has a good, solid "feel". If you pull too much you will strip the thread. This feel is a matter of experience and will come naturally after a little practice. The adjustable wrench requires oil on the moving parts from time to time. Once again, do not allow any dust or dirt to accumulate.

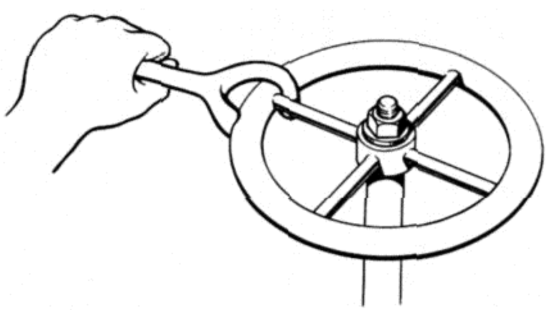


Figure 6-26 Wheelspanner

You will find that the words "*spanner*" and "*wrench*" are almost interchangeable. However, in 'the RCN the correct word for the tool described above is a wrench. What you may call a spanner is a very specialized type of wrench, and the most common of these is the "wheel spanner" which is used for turning valve handwheels. If you are in a job where you may have to open and shut valves, you should not be without one of these tools. In fact, in a submarine most members of the ship's company carry one at all times.

Handsaws

There are two main types of hand saws. The general purpose type is the cross cut saw. It is designed mainly for cutting across the grain of wood. The rip saw is used for cutting along the grain.

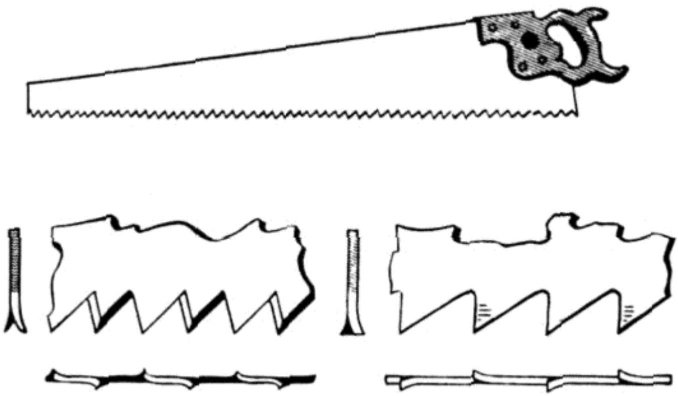


Figure 6-27 Cross-Cut Saw

To begin sawing with a cross cut saw, start with a gentle backwards pull. With a rip saw, start with a gentle forward push. With the saw handle in one hand, use the raised thumb of the other hand to guide the saw.

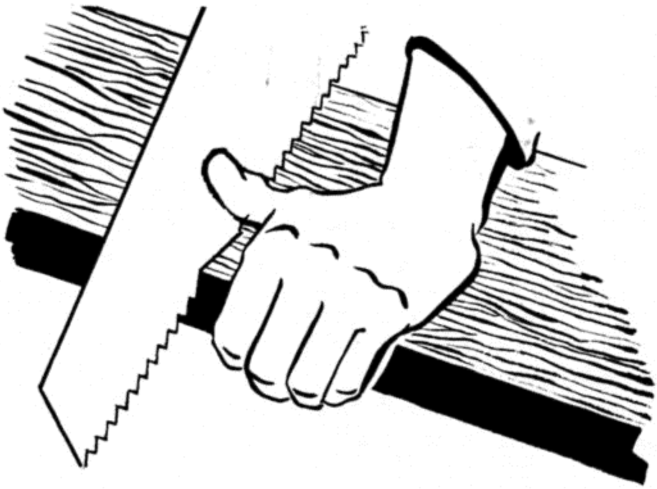
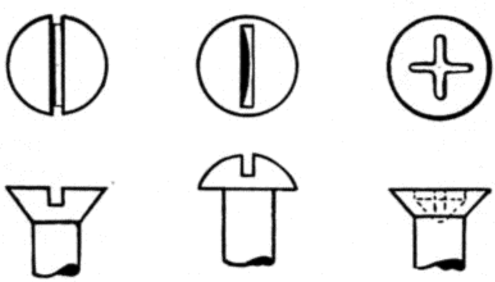


Figure 6-28 Hold Your Thumb High to Start the Saw

When you have started, apply medium pressure on the forward stroke, and no pressure on the back stroke. Too much pressure on the forward stroke may cause the saw to jam and buckle.

Screws

Screws come in a variety of sizes and shapes. The most common are the flat head round head and Phillis' head. A



FLAT HEAD ROUND HEAD PHILLIPS HEAD

Figure 6-29

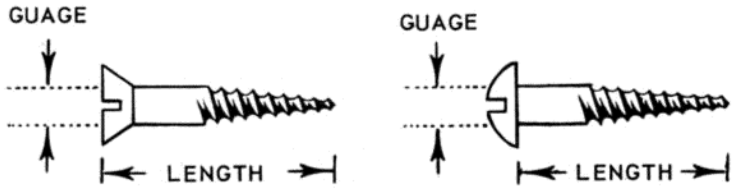


Figure 6-30 Wood Screws

screw is described by its length and its gauge or diameter. The length of a flat head screw is the total length; that of a round head screw is the length from shoulder to tip.

The gauge starts with No. 0 which is 1/16" diameter and works up to No. 24 which is 3/8 diameter.

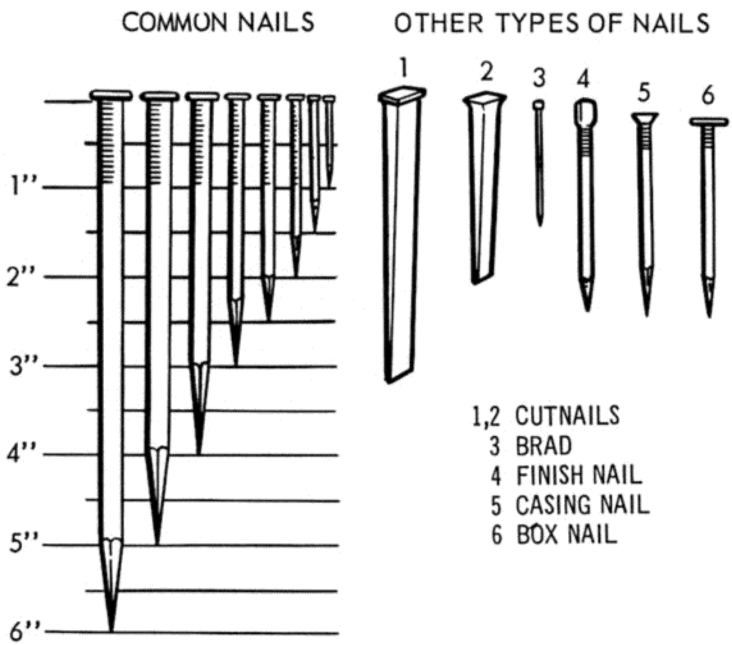


Figure 6-31 Nails and Nail Sizes

Nails

Common nails and finishing nails are the types you are most likely to encounter. There are other types used for special jobs.

The finishing nail is used if it is desirable to sink the head below the surface of the wood. Three rules for the use of nails are: (1) stagger the rows of nails so that they won't line up with the grain and cause splitting; (2) drive nails at an angle or slant so that they will hold better. (3) Use nails that will not pass right through.

Abrasives

Sandpaper, emery cloth and the like are called abrasives because they *wear down* materials over which they are rubbed.

Abrasives may be divided into two main types; those used on metal and those used on wood. The *sand* used on metal abrasive papers is normally an artificially made compound.
That used on wood abrasive papers is normally natural flint or gravel.

If you want to remove paint with an abrasive paper, there is a special type called *open coat*. Do not use ordinary or *closed coat* papers for this job– they will clog up quickly.

Alien sanding wood, always sand with the grain. Use a coarse abrasive first, and finish up with a fine one.

To Conclude

For the efficient use of tools, the most important single factor is *common sense*. If you don't know how to use a tool, ask someone who does. Never place any part of your body in front of a sharp tool you are using. Never play with tools. Treat them well, and they will do good work for you.

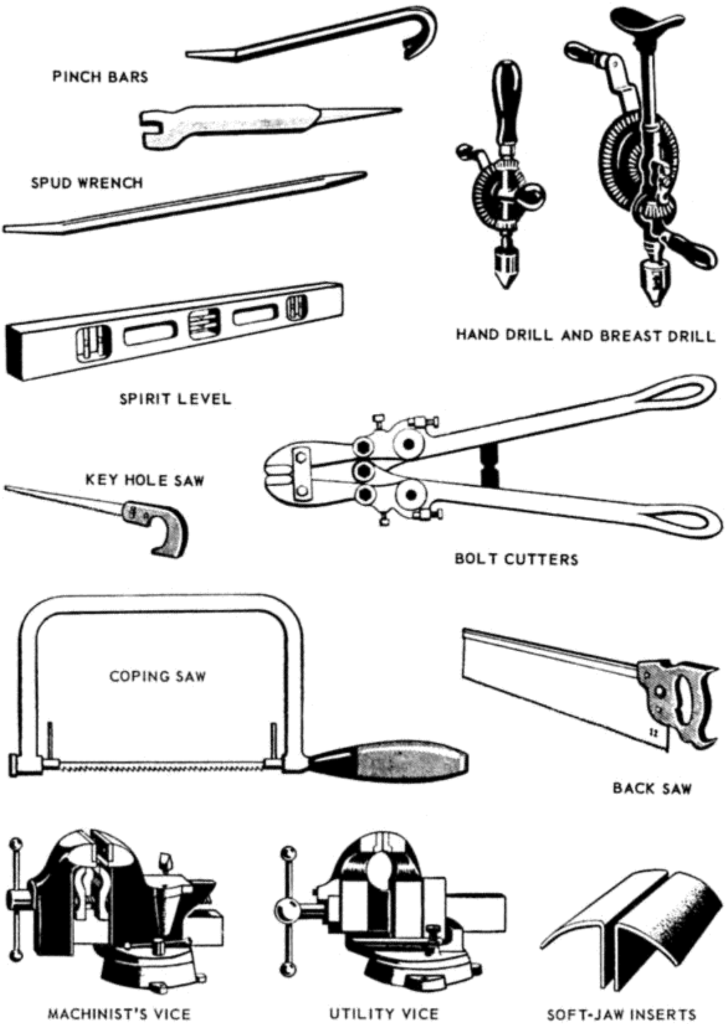
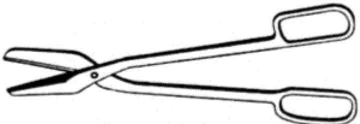
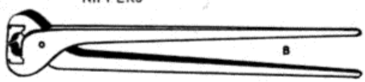


Figure 6-32 Tools Which Should be Recognized

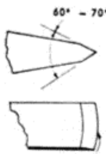


"TROJAN" SNIPS

NIPPERS

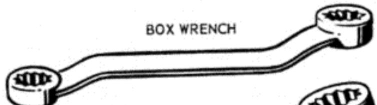


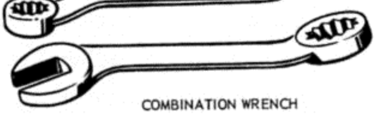
FLAT COLD CHISEL



CONVEX

BOX WRENCH



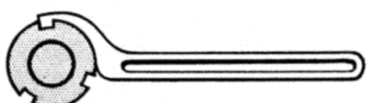


COMBINATION WRENCH

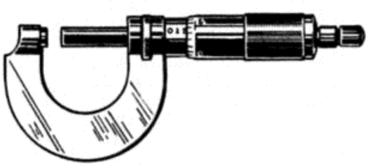
DOUBLE-CUT FLAT FILE

SOCKET CHISEL

CENTRE PUNCH



HOOK SPANNER



1-INCH OUTSIDE MICROMETER

JACK PLANE

QUI Z

1. Who does the bulk of the maintenance in a ship?
2. Name five of the eight rules in painting.
3. Explain how a rust spot is dealt with indoors? outdoors?
4. Explain exactly the proper way of using a paint brush.
S. Explain exactly the proper way of using a roller.
6. What are the general principles of spray painting?
7. How do you clean brushes? rollers?
8. What are the general rules in cleaning spray equipment?
9. What four things are accomplished by lubrication?
10. Why use exactly the right tool for any particular job instead of another which will do it but was not meant for the purpose?

The answers to these questions may be found in Chapter 6. When you can answer all of these questions perfectly, you may consider yourself to have a fair grasp of this chapter.

CHAPTER 7

ROPEWORK

If you are harbouring the idea that the businesses of rope-work and rigging belong solely to the boatswain trade, you are a far cry from the truth. In civilian life the basic arts of making knots, splices, bends and hitches are practiced by archers, artists, automobilists, bakers, basket-makers, blasters, bookbinders, bootmakers, burglars, butchers, carpenters, circus men, cooks, climbers, coopers, cowboys, dressmakers, electricians, farmers, firemen, fishermen, gardeners, hangmen, housewives, jewelers, musicians, nurses, parachutists, skiers, stevedores,. surgeons, weavers and well diggers to name but a few. In the RCN, an elementary knowledge of rope and rigging is a vital necessity to every trade, and this includes those trades in the miscellaneous group which do not get to sea as often as they would like to.

The two main rigging jobs in a ship which may be required of men of every trade are the handling of heavy weights and the securing of gear against a heavy sea. The primary object of this chapter is to provide you with sufficient knowledge of rope handling to do these jobs efficiently. In Chapter 8, you will see how the jobs are done.

Rope

Rope in the RCN is made from Vegetable fibre, from wire, or lately, and in ever-increasing quantities, from synthetic fibres such as nylon. That which is made from vegetable matter or synthetic fibres is called cordage, and wire ropes are merely called wires.

Cordage

There are five types of cordage in use in the RCN. They are *Manila*, *sisal*, *hemp*, *coir* and *synthetic*.

Manila rope is made of fibre from the leaf of the wild banana tree. It is quite flexible and it wears well. It may be used in jobs where strong cordage is required.

Sisal rope is made of the fibre from the leaf of the agave which is a member of the.cactus family. It is neither as strong nor as flexible as Manila and it does not weather well. It is not used in jobs where a high degree of reliability is required.

Hemp rope is made from the skin of a plant similar to a nettle. It is softer and heavier than Manila but it is as strong or stronger. In the RCN hemp is treated with a green coloured preservative which protects it against totting.

Coir, which is sometimes called grass, is made from the fibre of coconut husks. Its only advantage is that it floats. Coir is only about one-fifth the strength of Manila or hemp and it wears and rots quickly.

Synthetic ropes are usually very strong, do not absorb water easily and resist wear and rot. For many uses they are superior to ropes made from natural fibres and their use will no doubt increase. They are usually more expensive than other types.

Manufacture of Rope

Since you will be handling cordage almost every day in your service career, it is interesting to discover just how it is made.

First of all the vegetable fibres, which are five feet or less in length, are combed out into a long even ribbon.

Figure 7-1 Fibres of a Rope

These ribbons are then twisted, or *spun* into *yarns. A* number of yarns are next twisted into *strands* and, finally, the strands are twisted into rope.

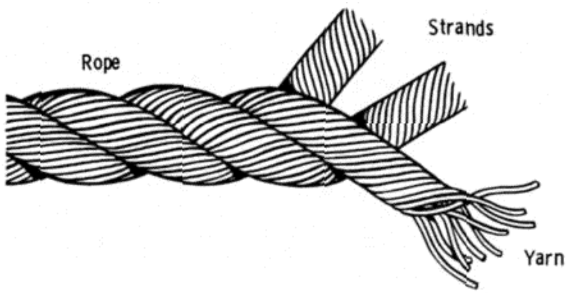


Figure 7-2

The fibre rope which you will encounter most often in the RCN has three strands. This is called *hawserlaid* rope. Rope with more than three strands is used for some specialized jobs, but it is weaker and less liable to stretch. Most rope in the RCN is *righthand lay.* That is, the strands are twisted in a counterclockwise direction. To recognize righthand lay, look down on it. The lines between strands go in the same direction as the middle line in the letter Z.

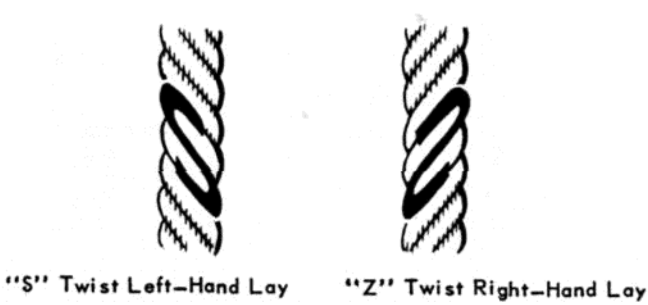


Figure 7-3

Measurement and Working Load

In the RCN the measurement of a rope is the distance around its circumference. Be very careful in selecting rope by size as sometimes it is difficult to know whether the size is the diameter or the circumference. A mistake can cost lives. The safest method is to use the breaking stress as a guide.

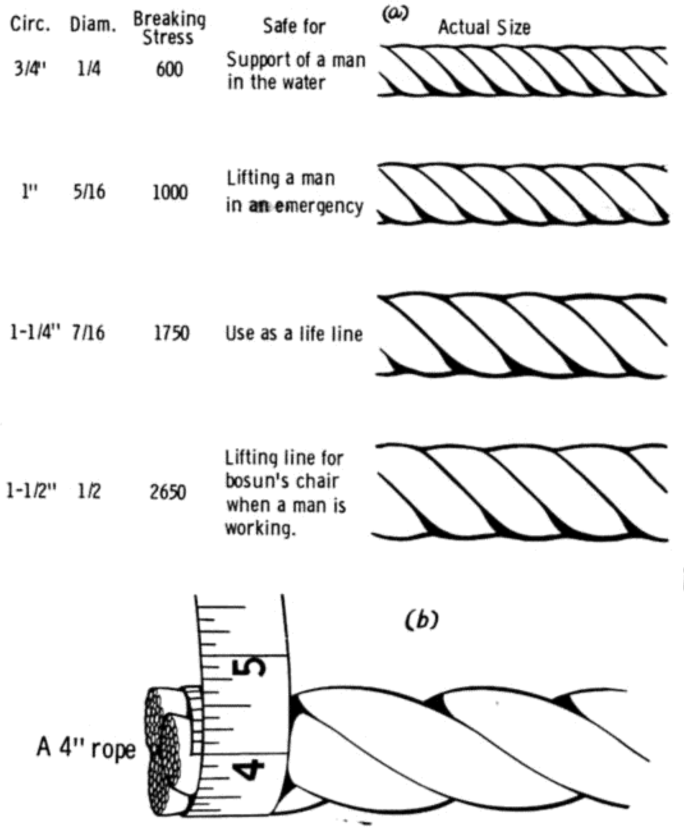


Figure 7-4

Strength of Rope

The breaking stress of a rope is determined by actually breaking samples of the rope in a laboratory. The breaking stress of ropes in service in the RCN is noted in the catalogue of material. When ordering a rope to lift a given weight it is standard practice in the Navy to multiply the weight to be lifted by five and select the rope from the catalogue whose breaking stress in not less than this figure. This is termed allowing a safety factor of five. Figure 7-4(a) gives a rough guide as to the safe limits of working the common Manila lines about a ship.

Small Stuff

Any cordage under a half-inch circumference is known as small stuff. Of the many types of small stuff, only the two more commonly used will be discussed here. These are twine and *spunyarn*.

Twine consists of from two to four *threads (a* thread is a very small yarn) twisted together. Twine is made of hemp.

Spunyarn consists of from two to ten yarns twisted together. It is much larger than twine. Spunyarn is made from any sort of fibre.

Neither of these two varieties of small stuff are reliable cordage and neither is assigned a working load.

Wire Rope

Wire rope is made up on the same principles as cordage except, of course, that the yams are wires and are twisted into strands around a length of jute yarn or wire. The strands themselves are twisted around either jute or hemp small stuff or rope. jute is a fibre obtained from the inner back of a plant called jute. There are generally six strands in wire rope.

Wire rope comes in three qualities: steel wire rope, flexible steel wire rope and extra special flexible steel wire rope.

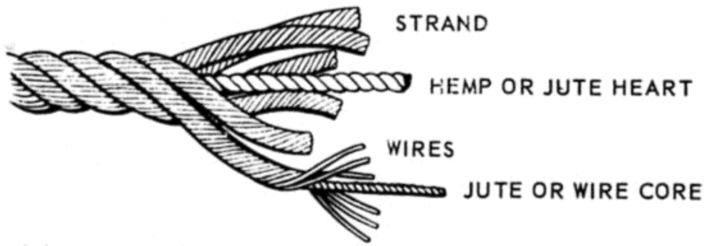


Figure 7-5 Construction of a Steel Wire Rope

Wire rope is made more flexible by having a jute heart in the strands, or by making the wires smaller and more numerous.

Wire rope is measured in the same way as cordage. The working load varies with the type and quality of the rope. You should ask a boatswain if you ever need to know the working load of a particular wire rope. Wire rope is from five to nine times stronger than any cordage of similar size, but it is about the same number of times more difficult to handle. Unless you practice the boatswain's trade, you will not normally have to handle wire rope except to heave on it.

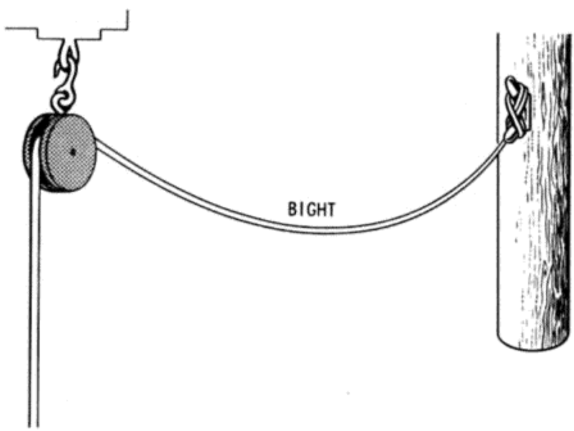


Figure 7-6

Handling Cordage

There are special terms used in the handling of cordage. Until you know these terms thoroughly, there is no point in reading this chapter any further.

Bight: The slack piece of rope between two working or fixed parts.

To haul: To pull by hand.

To make fast: To fix a rope by turning it up around a cleat or bollard or to secure it in some other way.

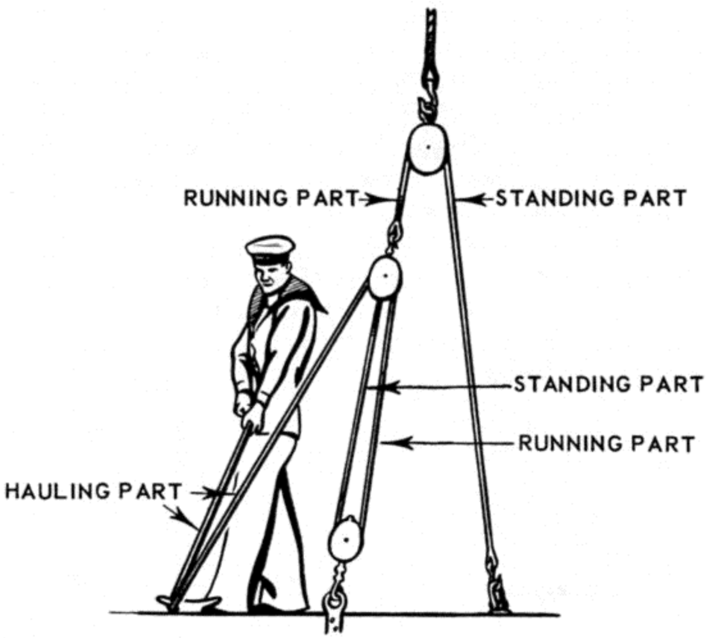


Figure 7-7

Hauling part, running part, standing part: A study of Figure 7-7 shows that the hauling part is what you haul on, the running part is that which runs through the block and the standing part is that which is made fast to the deck, block or other fitting.

Figure 7-8

There are a few general rules about handling cordage:

1. Wear your knife at all times you are working with cordage.
2. Whenever you cut a rope, make sure to whip the ends immediately (see Figures 7-6 to 7-8). If you do not, the strands and their yarns will unlay.
3. If you are hauling in on a rope, coil it down as you haul it in, if possible. Then it is ready to be stowed or used again straight away.
4. Never stand under a weight being hoisted. When a rope parts, it parts very quickly . . . and when you are squashed you stay squashed.
5. Never stand in the bight of rope.

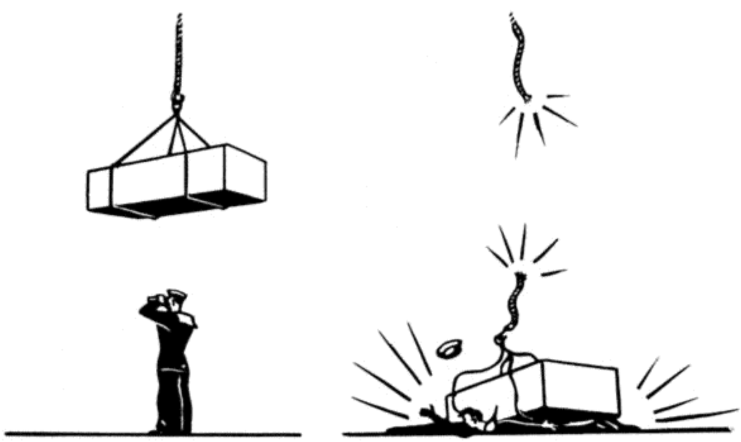


Figure 7-9 Never Stand Underneath a Hoist

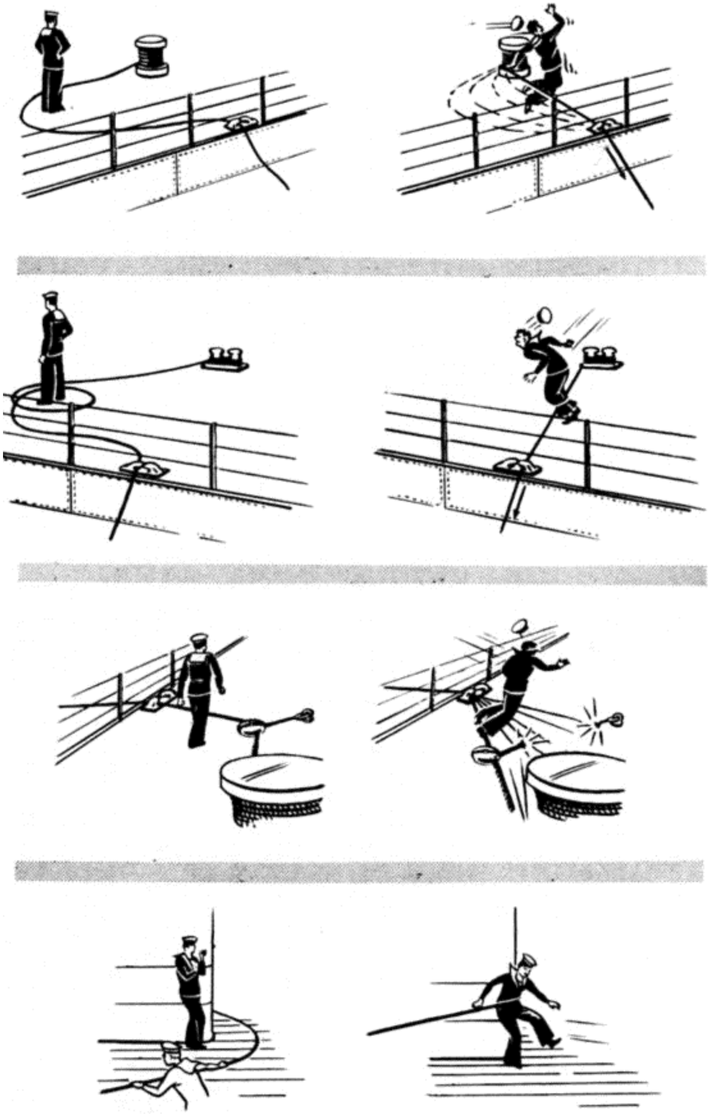


Figure 7-10 Never Stand Within a Bight or Coil

Figure 7-11 Result of Coiling Down Against the Lay

Coiling Down

There are two ways of coiling down rope. Small rope may be coiled down in your hands, but larger rope must be coiled down on the deck. Rope should always be coiled with the lay. If it is coiled against the lay, the turns will quickly become snarled.

Figure 7-12 Coiling Down

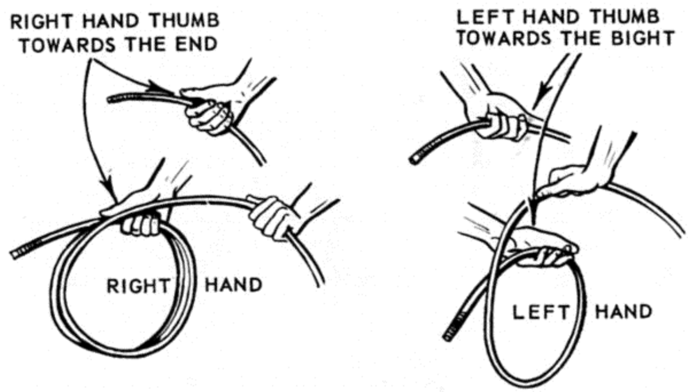


Figure 7-13 Coiling a Line

On the deck, righthand laid rope is coiled clockwise to be with the lay.

In your hands, it is a little more complicated. If you are to hold the coil in your left hand, your left thumb should point away from the end. If you are to hold the coil in the right hand, the right thumb should point toward the end.

Figure 7-14 Coiling Down From the Wrong End-Kinks Developing

If you wish to coil a rope which is made fast at one end, start the coil as close as you can to the end made fast. The last turn will be that with the free end. If you try to coil starting with the free end, the rope will kink because every turn on the coil puts a twist into the remaining rope, and these twists obviously can't turn themselves out while the end is made fast.

If the end made fast is to become a running part when it is taken off the cleat or bollard, it will be necessary to turn the coil over in order to get the running part on top.

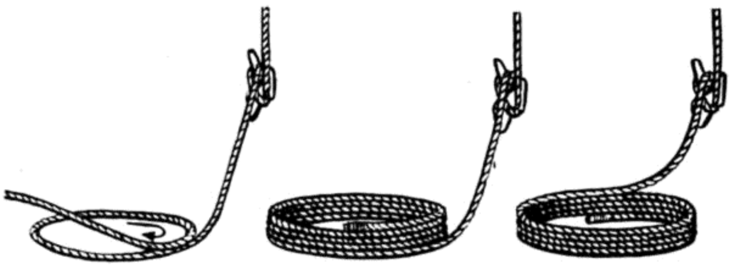


Figure 7-15 To Coil a Rope for Running

Whipping

Of the more than 20 methods of whipping, the one most regularly used in ships is called, simply, the common whipping. This is the whipping with which you will stop a newly cut end of rope from unlaying.

Using twine, lay one end along the rope end and then take a turn against the lay (from right to left) and over the end. Carry on turning against the lay, hauling each turn taut until you have used about ¾ of your twine. Now take the end which you have in your hand, lay it downward along the rope and take a turn around it. This will leave you with a bight in your hands.

Figure 7-16

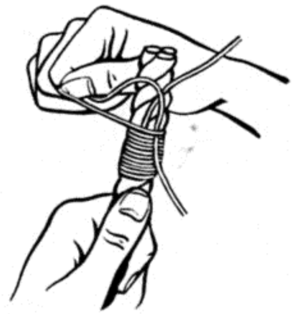


Figure 7-17

Make turns now by looping the bight over the rope end until there is no longer enough twine to make another turn. Finally, pull the bight taut with the end which sticks out in the middle; cut off both ends, and you have made a common whipping. A whipping should be about as wide as the diameter of the rope.

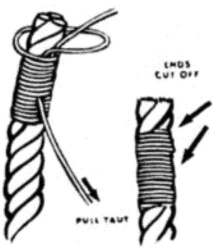


Figure 7-18

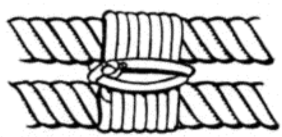


Figure 7-19 Racking Seizing

Bends and Hitches

A *bend* joins together two rope ends. A *hitch* generally secures a rope to some static object or to another rope if the latter is not involved in the actual making of the hitch.

A bend is a temporary measure. It is used when you wish to lengthen a piece of rope by adding another piece. If you were

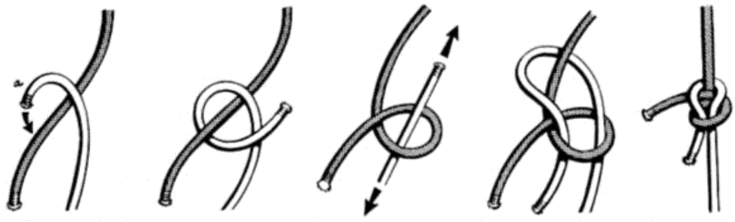


Figure 7-20 Sheet Bend

going to join the two ropes permanently. you would use a more permanent *splice*. Because of its temporary nature, a bend must be easy to open.

The easiest reliable bend to make is the *sheet bend. A* loop is formed in the dark rope by leading end “a” as shown in Figure 7-20 and putting more weight on the light rope than the dark. If you want, you can dispense with these two steps and make a loop in the dark rope before you start. After that just follow Figure 7-20.

A sheet bend may also be used where there is already an eye in one of the ends. Follow exactly the same procedure.

The double sheet bend is no stronger than a single one but it is more secure. It is made by merely taking two turns around the eye.

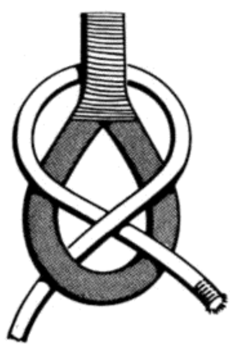


Figure 7-21 Sheet Bend

Figure 7-22 Double Sheet Bend

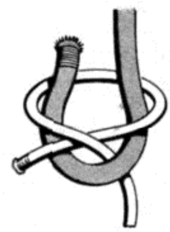


Figure 7-23

Another great advantage of the sheet bend is that it may be used to bend a smaller rope to a larger one. If the larger rope is stiff, merely bend it back as shown in Figure 7-23.

Work the smaller rope through as if it were an eye. In this case, it is a good practice always to use a double sheet bend.

A far more reliable bend is the *carrick bend*. This is a little more complicated to make, and is very easy to make incorrectly. *The incorrect versions of the carrick bend are unreliable to a point of being dangerous*. Figure 7-24 shows the true carrick bend.

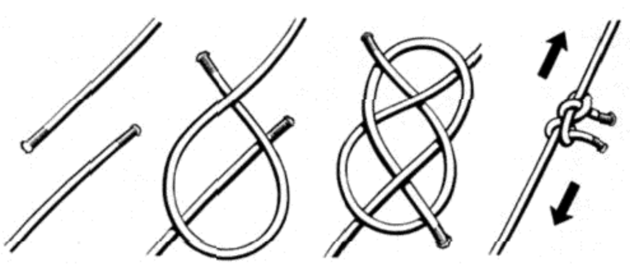


Figure 7-24 True Carrick Bond

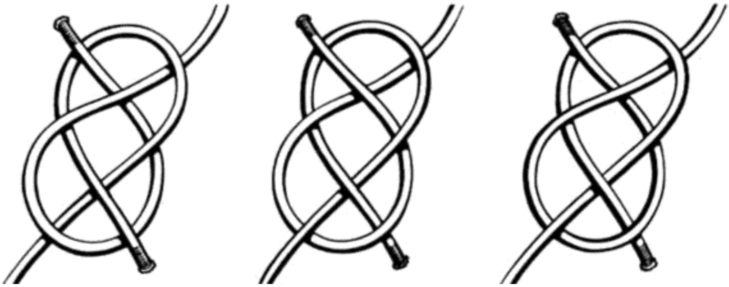


Figure 7-25 Dangerous Carrick Bonds

If your carrick bend looks like any of the ones in Figure 7-25 it is extremely dangerous and should not be used.

The ends of a carrick bend are stopped or seized to their standing parts when bending together two hawsers for use around a capstan.

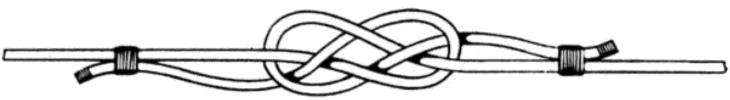


Figure 26 Carrick Bond with Ends Stopped

For securing a rope to a small ring, a *round turn and two half hitches* is used.

This is a most reliable hitch. The use of a complete round turn spreads the wear or nip of the ring over two parts of the rope. This hitch will never jam and it is an easy one to cast

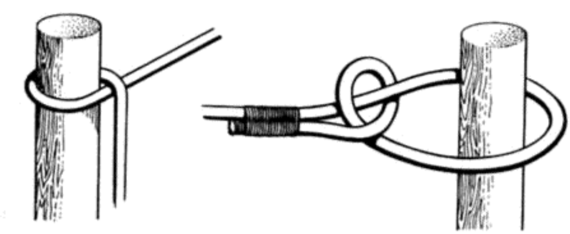


Figure 7-27 Half Hitches

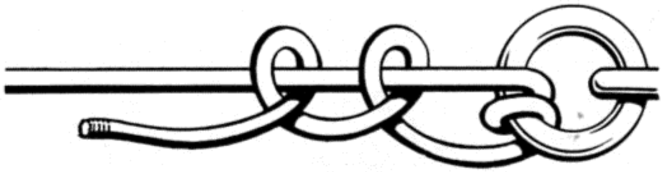


Figure 7-28

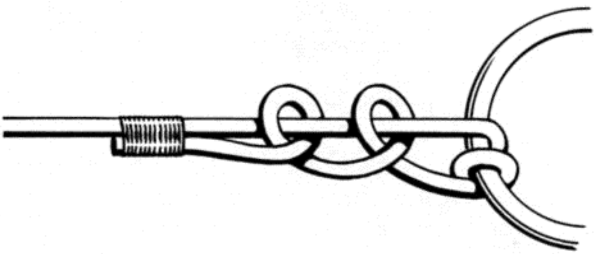


Figure 7-29

off. If it is going to remain for any length of time the end should be seized to the standing part.

For lifting a spar, the quickest and most useful hitch is the timber hitch. The beauty of this hitch is that while there is a strain on it, it is most secure. However, once the strain is taken off, it virtually falls apart.

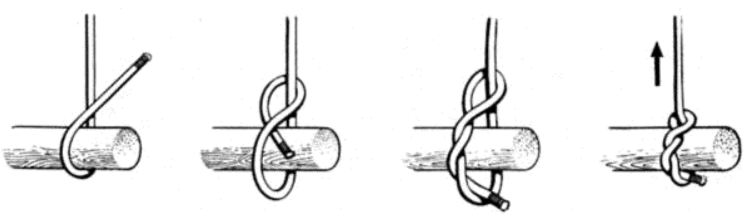


Figure 7-30 Timber Hitch

Before hoisting, a half hitch should be taken with the standing part around the spar, Figure 7-34. A timber hitch can be used around a soft bale or sack for hoisting on the end of a rope.

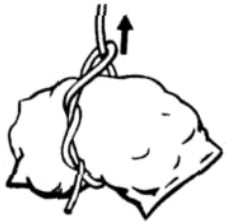


Figure 7-31 Timber Hitch

A clove hitch is used to secure the end or bight of rope to a spar or beam. It is made at the end as shown in Figure 7-32 and on the bight as shown in Figure 7-33. This hitch may slip if pulled along the spar. However, there is a hitch especially designed for pulling. This is the *rolling hitch.*

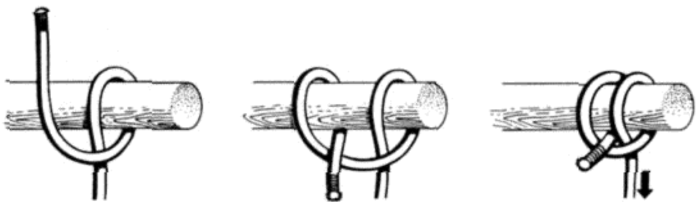


Figure 7-32 Clove Hitch on an End

Figure 7-33 Clove Hitch on a Bight

Make a round turn, Figure 7-35(i), cross the end over the turn and the standing part and make a half hitch (ii). The pull must be made in the direction of the round turn.

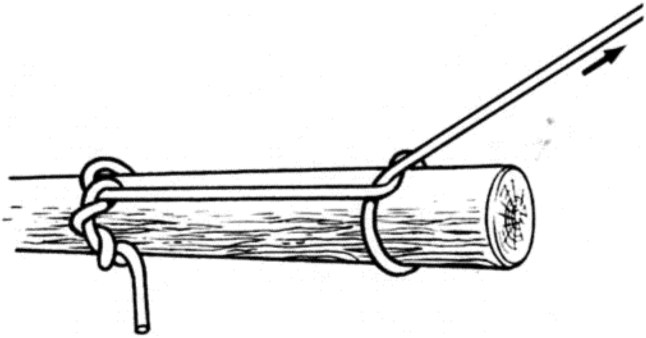


Figure 7-34 Timber Hitch and Half Hitch

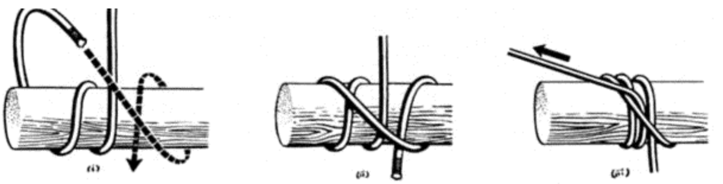


Figure 7-35 Rolling Hitch

Some hitches are used to make a rope fast to a hook. The simplest of these is the *Blackwall hitch.* This hitch should not be trusted with too much strain. A better hitch under any circumstances is the *midshipman's hitch* (sometimes called a bill *hitch).*

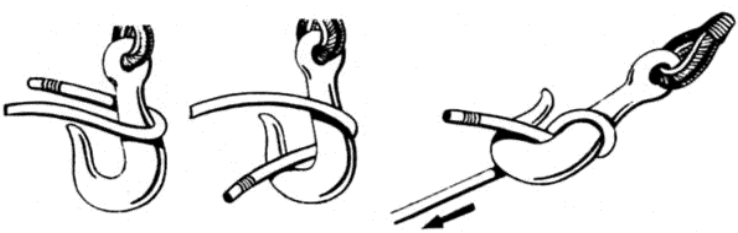


Figure 7-36 Blackwall Hitch

Figure 7-37 Midshipman's Hitch

The Blackwall and the midshipman's hitch permit you to make a rope end fast to a hook. But suppose you are lifting some object and you wish to prevent the bight from slipping on the hook. Unless you do make it fast, there will be nothing to prevent one end of the weight from taking charge. The best hitch for this purpose is the catspaw.

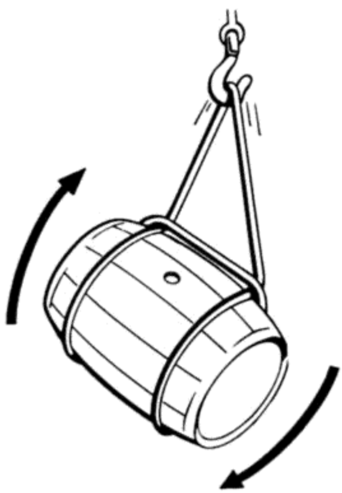


Figure 7-38

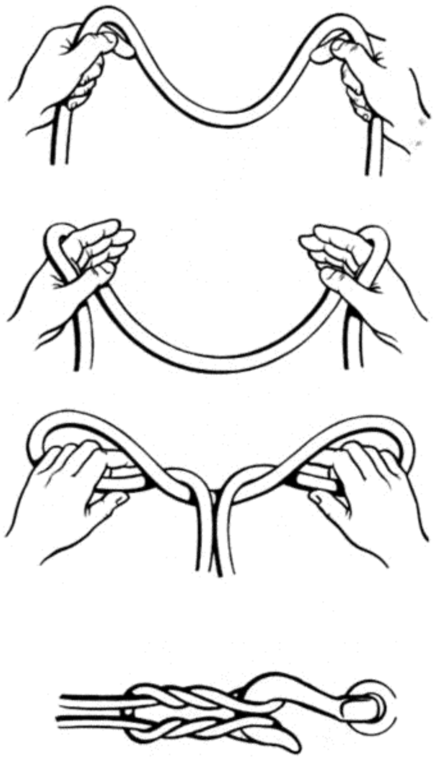


Figure 7-39 Cats Paw

Take the bight in both hands, turn three full twists away from you, put the two bights together, and slip them over the hook.

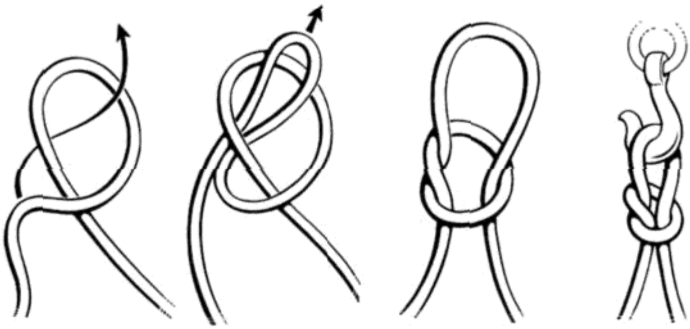


Figure 7-40 Marline Spike Hitch

One other hitch which serves this purpose and which you will encounter later in a different role is the marline spike hitch.

Knots and Splices

In a general sense, all bends and hitches are knots, but in the more precise seaman's language, a knot serves various useful purposes but must not be *used as a bend or a hitch. Therefore, what you will call a knot will be anything but a bend or a hitch.*

Many knots are used for binding; that is, for tying two ends in order to secure some object in their bight. The most impor-

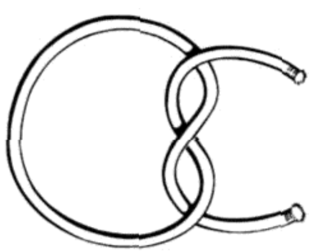


Figure 7-41 Overhand Knot

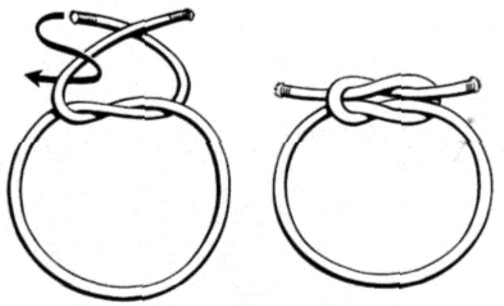


Figure 7-42 Reef Knot

tant of these in the reef knot. This is a combination of two *overhand knots*. (an overhand knot is the first one you make in tying your shoelace.)

In a reef knot the two overhand knots are made in opposite directions. If you make the overhand knots in the same direction, you will make a granny knot, which is useless because it slips.

A reef knot will not slip if properly used. However, a reef knot will not hold if it is subject to a great strain, such as would be encountered if it was used to join two ropes when hauling. For such purposes a sheet bend should be used.

Making a temporary eye which will not slip is another use of knots. The most commonly used knot for this purpose is the bowline. Learn this knot thoroughly because it would not be unusual for you to have to use it every day you are serving in a ship. It is an old saying that "the devil would make a good sailor if he could only tie a bowline and look aloft!"

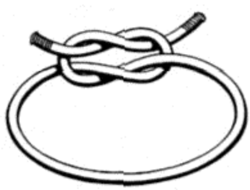


Figure 7-42 Granny Knot

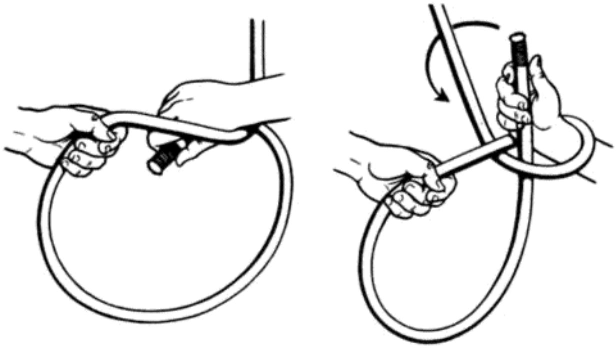


Figure 7-44

As you will see, a bowline is nothing more than a sheet bend made with a single piece of rope. Make the loop as in Figure 7-44. Then make a sheet bend round it and haul all the parts taut.

Another use for knots is to temporarily shorten a piece of rope. A *sheepshank is* normally used for this purpose. This is simply a matter of flaking out two parallel bights and taking a half hitch around each. This knot is quite firm as illustrated but a greater degree of reliability may be had by seizing the two bights to their standing parts.

For an even more reliable rope shortener use a sheepshank, substituting marline spike hitches for the half hitches.

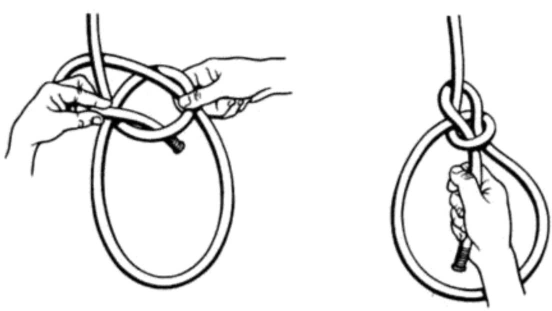


Figure 7-45

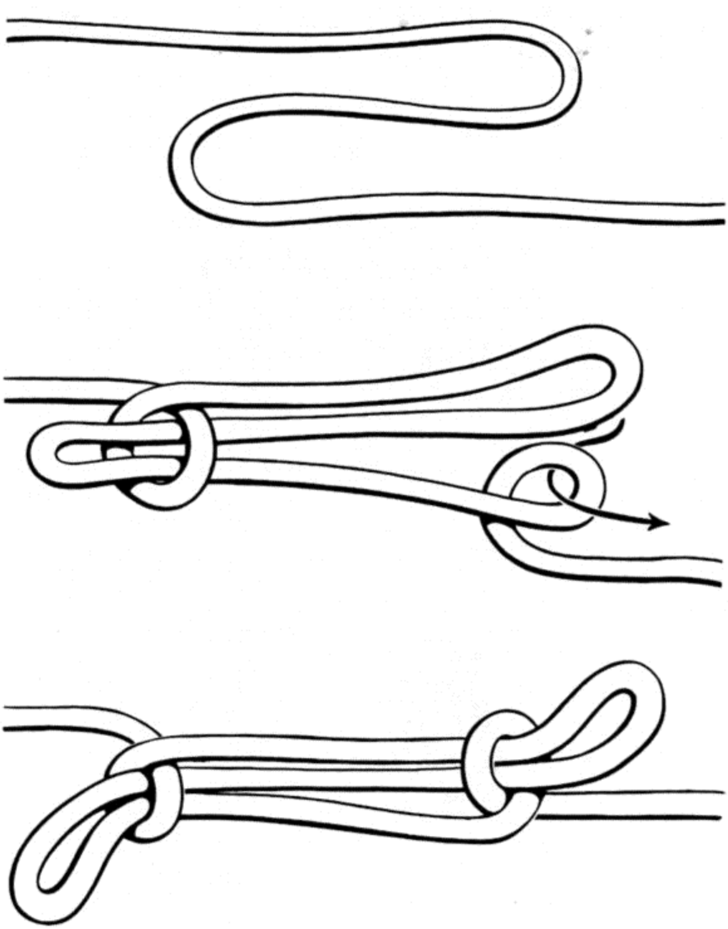


Figure 7-46 Sheepshank

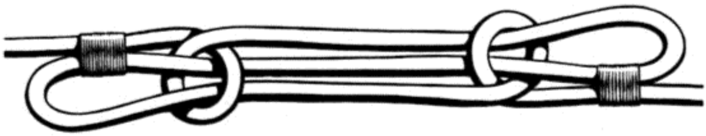


Figure 7-47 Sheepshank with Bights Seized

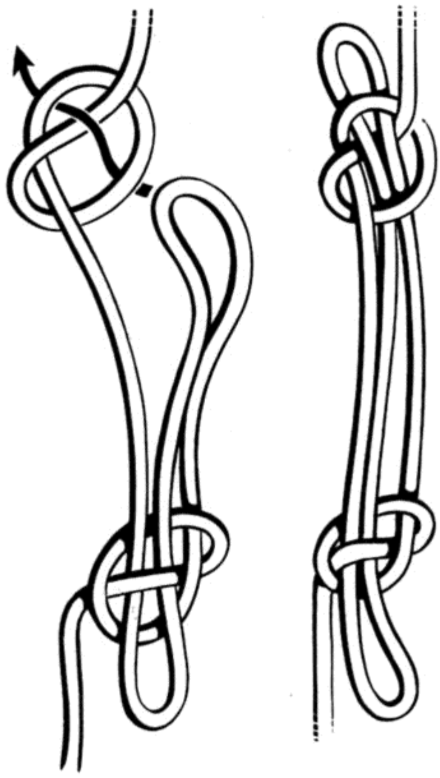


Figure 7-48 Sheepshank using Marlin Spike Hitches

The details of splicing a rope are rather too complicated to be given in this book. Unless you are a boatswain it is doubtful if you would be called upon to make a splice . . . provided you know the bends, hitches and knots already shown in this chapter.

Quiz

1. What is cordage? Wire rope? How is it measured?
2. What is the working load of a 6 inch Manila rope?
3. What are the methods of coiling down rope?
4. Why is rope whipped? Seized?
S. What is the difference between a bend and a knot? and a hitch?
6. What is the main danger in making a carrick bend? What is the main advantage?
7. What is the best hitch for fastening a bight to a hook? Why?
8. What is the main use of a reef knot? A sheet bend?
9. What is small stuff?

The answers to these questions may be found in Chapter 7.

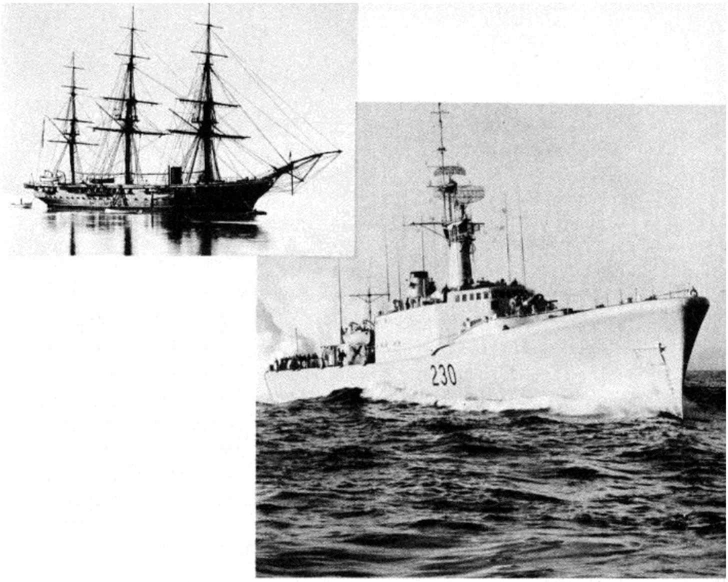


Figure 8-1 Rigging Then and Now

CHAPTER 8

RIGGING AND SHIPBOARD WORK

Rigging

All of the rope in a ship except that which secures the ship alongside or to a buoy is called rigging. Rigging is divided into two types – *standing* and *running rigging*. Standing rigging is made fast at both ends; running rigging at one end only. In short, running rigging is that with which you work, and standing rigging is that which does a single job unattended.

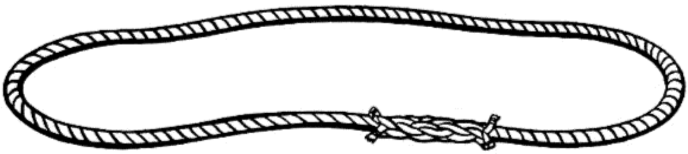


Figure 8-2

Generally, as the structure of ships grows stronger, the importance of standing rigging diminishes. Newer ships have less compared with their predecessors. For example, the only important pieces of standing rigging left on the upper deck of a Restigouche Class destroyer escort are guard rails and davit guys. The only running rigging on the upper deck of a new destroyer escort are signal halyards, boat's falls, and a few other specialized pieces. Compared with the ships of one hundred years ago, this is very little indeed.

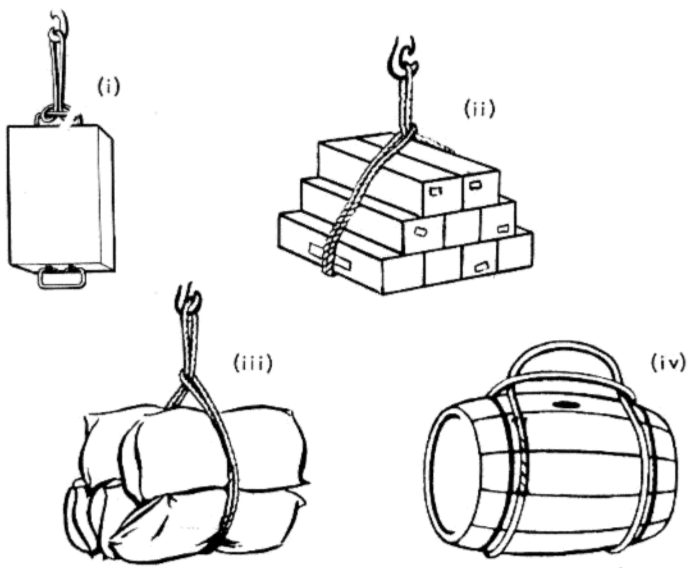


Figure 8-3

However, the rigging which we wish to consider is that which affects men of all trades in the ship. Boat's falls will be dealt with at length in Chapter 9, so we are left with that rigging which is necessary for shifting heavy weights and storing ship.

Slings and Slinging

First of all, the object which is to be lifted must be rigged so that it can be lifted without damage or danger of dropping. For this purpose, you may be provided with a *strop*, which is a piece of rope with the ends spliced together.

The best uses for strops are on crates with handles, on a group of light cases (arranged as shown in Figure 8-3(ii)) on a group of sacks (if they are sturdy ones), or on casks. If a group. of heavy cases is lifted or if the cases are arranged differently from Figure 8-3(ii),the strops will crush or damage the load.

A heavy case without handles may be lifted using two strops of equal length, but you will sometimes need to fit a crupper, as shown in Figure 8-4, so that the strops are kept apart, and the case does not slip out.

For dealing with sacks of vegetables, sugar, etc., a single sling with an eye at either end is most convenient. This is

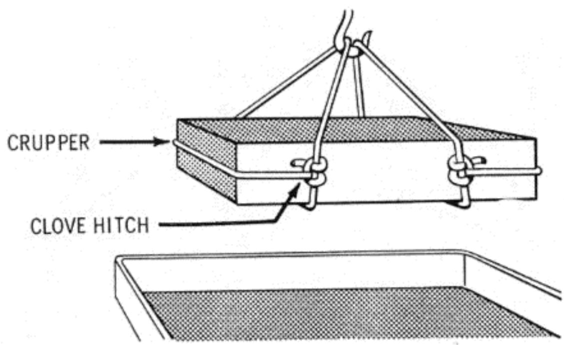


Figure 8-4 Straps and Cruppers

Figure 8-5 The Use of Snotters

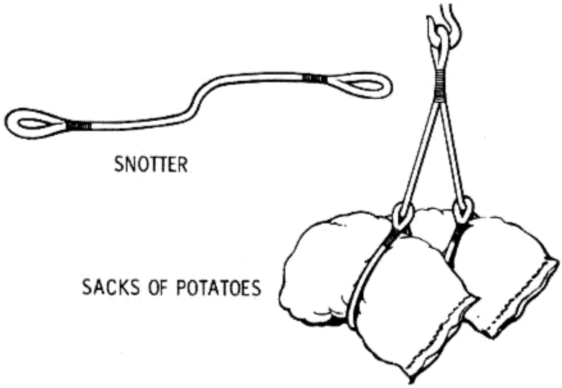


Figure 86

called a *snotter*. (Figure 8-5). Snotters are normally made up in pairs and are used as shown in Figure 8-6.

Along these same lines, a single sling with an eye at one end and a hook at the other is called a logwire. Its purpose is to hoist timber. Logwires may be used singly or in pairs.

Probably the most useful of all methods of slinging is the cargo net. It may be loaded flat on the deck and the slings

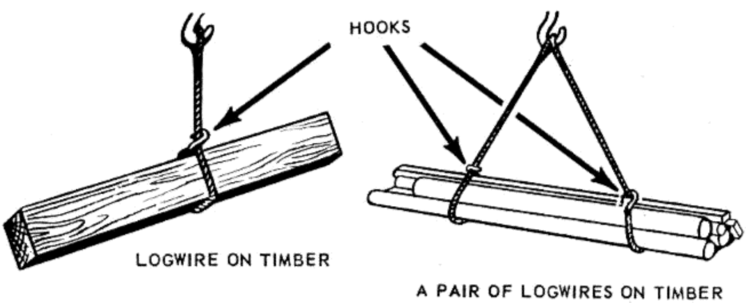


Figure 8-7 Logwires

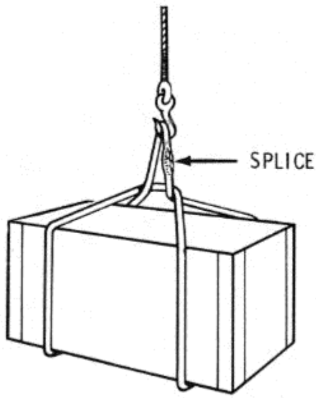


Figure 8-8 Cargo Net

Figure 8-9

placed quite easily on a hook. Cargo nets should not be used for fragile or very heavy objects.

One point to remember when using slings is that if there is a splice anywhere in the sling, it should not be allowed to touch either the object being lifted or the hook. An important

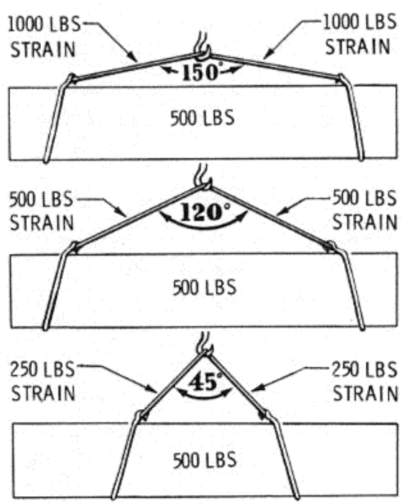


Figure 8-10

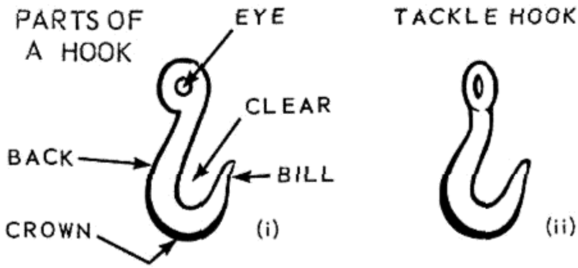


Figure 8-11 Tackle Hooks

Figure 8-12 Spring Hook

Figure 8-13 Cargo Hook

principle in the use of slings is that the angle between the legs determines the amount of weight each leg carries. It is easily seen in Figure 8-10 that as the angle between the legs gets smaller, the weight each leg has to carry gets lighter. (When you have passed your RCN Senior Matriculation Exams in Mathematics and Physics, you will understand *why* this is so.)

Hooks

We have started from the bottom, as it were, and worked upward. We have studied the load, the slings around it, the legs of the sling, and now we come to the hook over which the sling is passed.

The common type of hook is called a *tackle hook*. The eye of this hook may be reversed, that is, at right angles to the plane of the hook (8-11(ii)). The labelled parts of the hook shown in Figure 8-11(i), are the same for every type of hook.

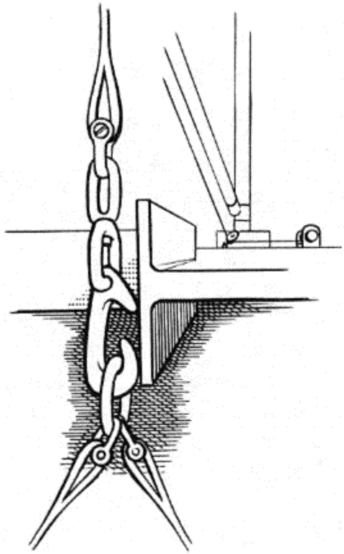


Figure 8-14

A very common variation on the tackle hook is the *spring hook.* As you can see, the springy metal tongue prevents a rope from jumping out of the hook, but does allow a rope to be pushed into the clear.

The last hook which we shall examine before passing upward to the next part is the *cargo hook.* You will notice that the bill is turned inward, and there is a “bump” just below the eye. There is a very good reason for this peculiar shape. When hoisting, that “bump” prevents the bill from catching on the hatch or any other object. The bill turned inward also helps to prevent this.

When using a tackle hook, it is sometimes necessary to *mouse* (pronounced mouze) the hook to prevent the sling from jerking out. Using a length of twine, start out as shown in Figure 8-15(i). Take two or three turns with both parts then take one part up and around the turns. Take the other part

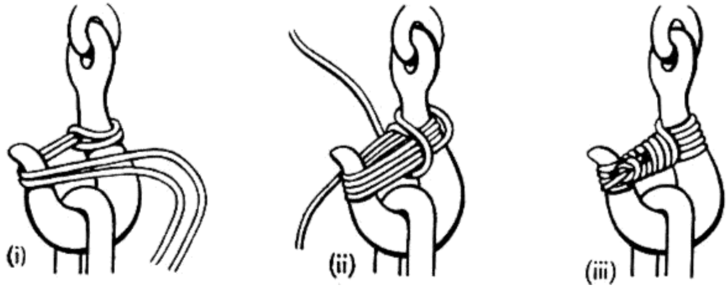


Figure 8-15 A Moused Tackle Hook

around the bill as in (ii). Finish up with a reef knot as shown in (iii). In addition to preventing a sling from jerking out of the hook, mousing actually strengthens the hook.

Mechanical Advantage

To understand the next and final part of weight-handling rigging, you must first master the basic principles of *mechanical advantage*.

Take an example. The simplest form of mechanical advantage is the *parbuckle*. *By* rolling the cask up with a parbuckle, only half as much pull is required as if you raised it directly with a sling and a rope.

Why?

Look at it this way. Each side of the rope stretches from the bollard to the cask and back again. That means that there is twice as much rope as there is directly from the cask to the man. Even so, all this rope has to be heaved in before the cask reaches the top. So you have actually heaved in twice as much rope to parbuckle the cask than you would to hoist it directly. Now, to raise a certain weight a certain distance only takes a certain amount of work energy no matter how you do it, so if you heave in twice as much rope, you must have exerted only *half* the pull on it. This is mechanical advantage.

Do you see the reason mechanical advantage is used? Suppose the cask was too heavy for one man to lift. Employing mechanical advantage he can lift it easily!

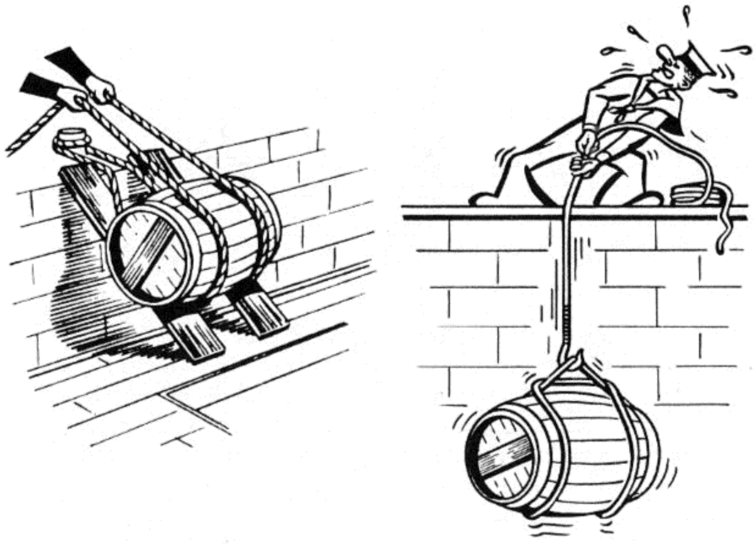
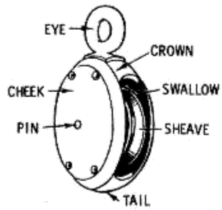


Figure 8-16 The Mechanical Advantage of a Parbuckle

The parbuckle used to be in wide use, but it is seldom used nowadays. The reason for this is that in the old days, almost every type of edible stores, and many types of what we call naval stores were stowed in casks. This practice died out gradually until in recent times the only important item of stores supplied in casks was rum. The rum cask has now been replaced by the bottle, and with it has gone the use of the parbuckle.

Blocks

The principal way mechanical advantage is obtained in a ship is by the use of *blocks.* A block is a portable pulley. The sheave is the roller which turns on an axle called the pin. A rope goes in the opening called the swallow, and rides on the sheave. The sheave is contained in a shell of which the *cheeks, crown* and tail are parts. An eye or a hook may be fastened on top.



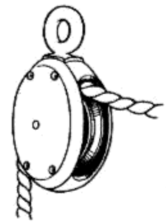


Figure 8-17 Parts of a Block Figure 8-18

The most commonly used and best type of utility block is called the I.B. (Internal Bound) block. In this type, metal parts are used to take all of the strain which a rope may put on the block. You can readily see that if the wooden shell gets broken it does not hinder the operation of the block. The shell merely protects the working parts of the block from rubbing and knocking.

The only other type of block to be studied here is the snatch block. This block incorporates the feature of having a hinged piece in one of the cheeks so that a rope may be inserted without the necessity of reeving it through the swallow. That is, a bight of rope with both ends secured could be inserted in a snatch block.

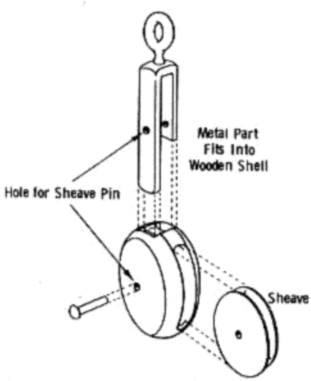
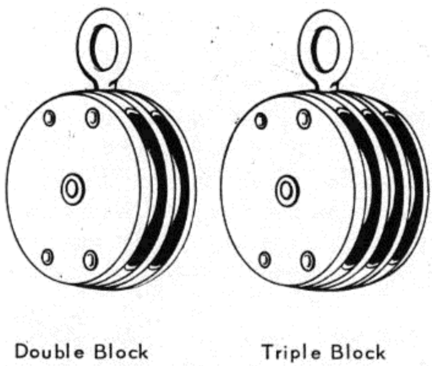


Figure 8-19 Internal Bound Block

Figure 8-20 Metal Snatch Block



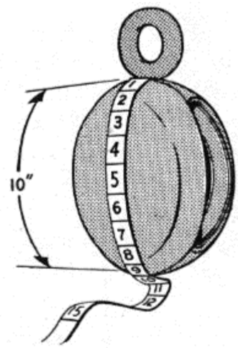
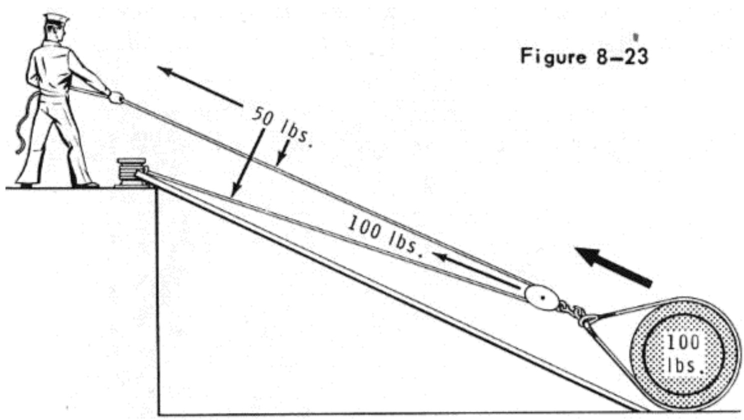


Figure 8-21 Figure 8-22 Measuring a Block

Blocks may have more than one sheave. The most commonly used are those with one, two or three sheaves, although four sheave blocks are sometimes used for special jobs.

Blocks are classified by the measurement from crown to tail around the shell. A block takes a rope one-third its size. Thus, a nine inch block will take a three inch rope.



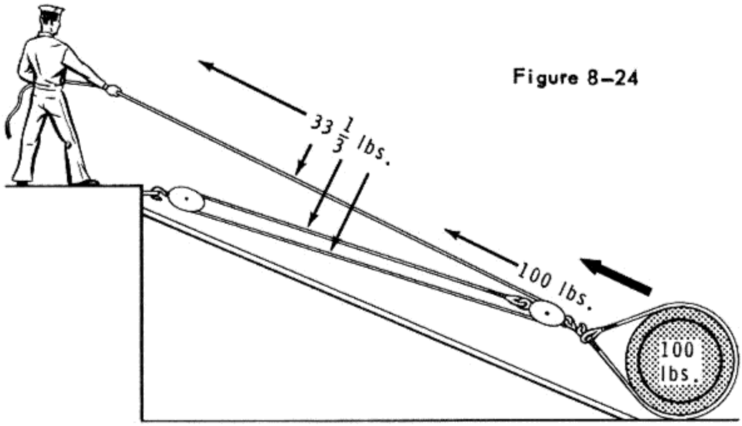


Figure 8-24

Purchases and tackle

A purchase is a device which produces mechanical advantage. Blocks may be used to form a purchase.

Remember the parbuckle. Now, suppose we attach the cask to a single sheave block. (Figure 8-23). We are achieving exactly the same mechanical advantage. If the cask weighs 100 lbs, each of the parts of the rope through the sheave must be exerting enough work to lift 50 lbs. In this case then, we say the mechanical advantage is 2, because the work we are doing is *doubled by* the purchase.

Suppose we now add another block to the system. There are now three parts exerting enough weight on block B to produce

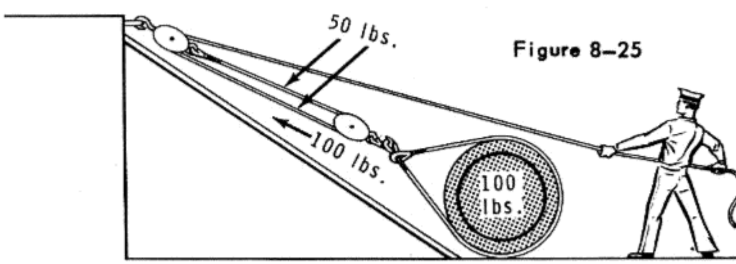


Figure 8-25

100 lbs. and pull the cask. Therefore, each part must be exerting enough work to lift 33⅓ lbs. Now since we are only pulling 33⅓ lbs. worth, out effective work has been trebled (3 x 33-1/3 = 100), so the mechanical advantage is three.

Suppose we take this set of blocks off the cask and reverse the whole purchase end for end. In this case we have to work from ground level and you will immediately notice that only two parts of the rope are actually pulling on the cask, so we are back to where we started with a mechanical advantage of 2.

Therefore, the same purchase can be rigged in two ways: either to your advantage (greater mechanical advantage), or to your disadvantage (less mechanical advantage).

Also, you must have noticed by now that the mechanical advantage gained is the same as the number of parts of rope *which emerges* from the block which moves *with the* load.

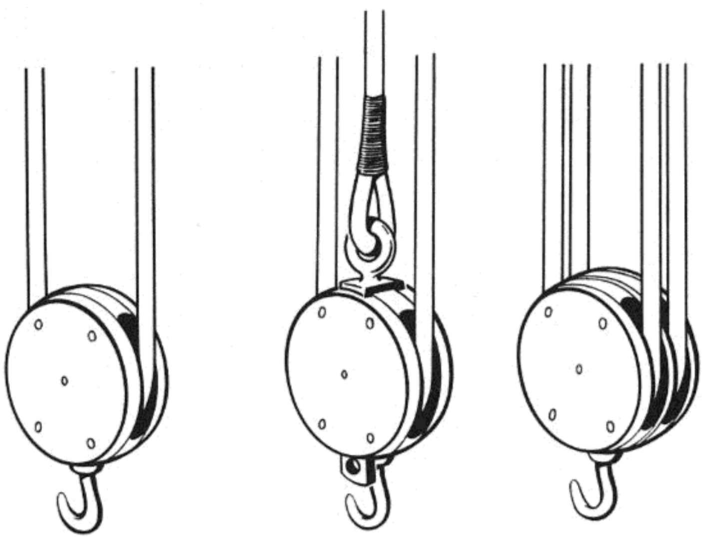


Figure 8-26

Friction

A technical factor which influences the use of purchases deserves mention at this time. It is not a point you should worry about, and it is rather too complicated to study fully. However, you should know that it exists. This is friction.

Friction is such an everyday occurrence that we seldom recognize it for what it is, but it is very real. If you are traveling along a perfectly flat highway in a car at 60 miles per hour, and you shut off the engine and coast, eventually the car slows down and stops. Why? All the moving parts of your car rub against those other parts which are holding them in place. The wheels rub against the road, and the body of the car rubs against the air through which it is passing. All these "rubbings-together" of things tend to slow the car down. They are friction. If you apply the brakes, you merely apply friction to the wheels or axles.

A block has moving parts. The sheave moves around the pin, and the rope moves around the sheave. The friction produced influences the mechanical advantage. Where we have said the mechanical advantage is 2, it may really be only 1.67. Where we have said it is 3, it may really be only 2.5.

For the purpose of this book, mechanical advantage will be given as if there were no friction. It is up to you to remember that friction does have an effect.

Tackles

Two or more blocks rove with rope to obtain a mechanical advantage are called a tackle (pronounced "taykle"). There are many types of tackles in use in the RCN. The size of a tackle is the size of the rope used in it. Thus a tackle rove with three inch rope is a three inch tackle.

The names of the parts of a tackle are shown in Figure 8-27. They are self-explanatory. The standing part doesn't move. The running part pulls the running block along the standing part. The standing block merely changes the direction of the running part so that it is easy to haul. The standing

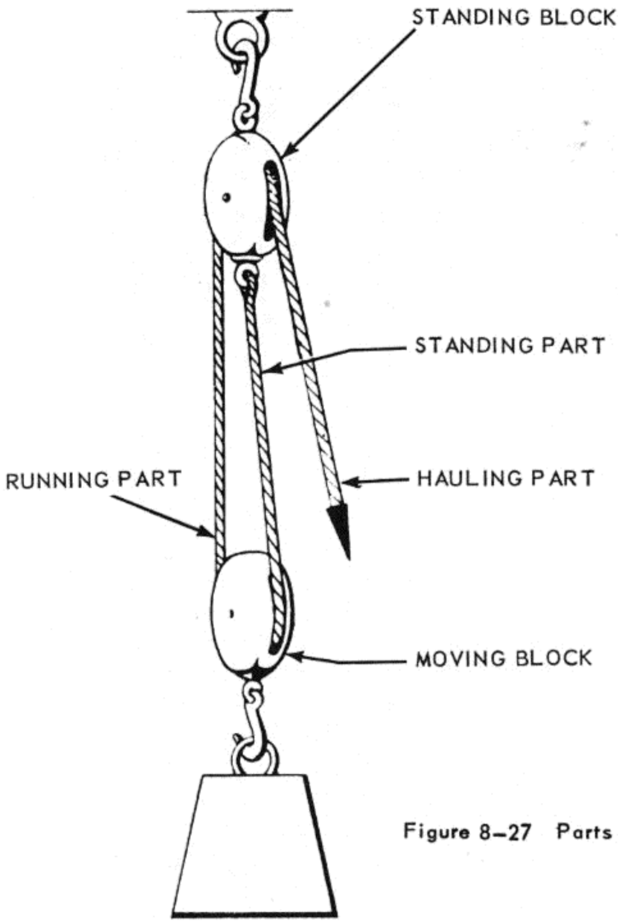


Figure 8–27 Parts of a Tackle

part need not be secured to the standing block; it could be secured like Figure 8-28.

The simplest of tackles is called a *double-whip.* It is normally rove as in Figure 8-29. Unless you are hauling from above the load, a double whip cannot be rove to advantage.

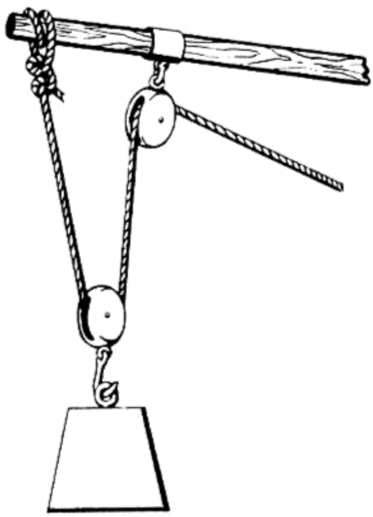


Figure 8-28

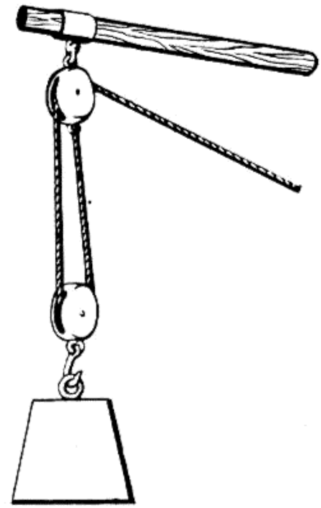


Figure 8-29 Double Whip

A *luff* is a tackle with one double and one single block. It is rove like Figure 8-30. A luff is always three inches or more in size, and its mechanical advantage is 4. A *jigger* is a luff of from 2 to 2½ inches in size. A *handy billy* is a luff of less than 2 inches in size.

A *twofold purchase* uses two double blocks. It is rove like Figure 8-31. A *threefold purchase* uses two triple blocks and looks like Figure 8-32. There is a tackle which has one triple and one double block. It is called a *five part tackle*, but it is not often used in the RCN.

Suppose that in securing a ship for sea you wish to slide a very heavy case into a position where you can lash it down. There is no one to help you, so you decide to move it using a luff. You reeve your luff to advantage as in Figure 8-33.

You now exert 100 lbs. of pull on the hauling part. The case doesn't budge. The mechanical advantage is 4, so your 100 lb. pull has become a 400 lb. pull. You decide, now, that

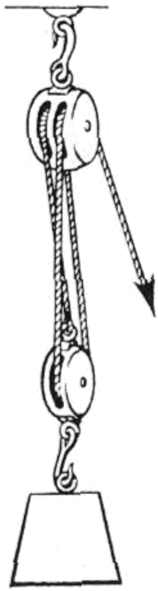


Figure 8-30 Luff

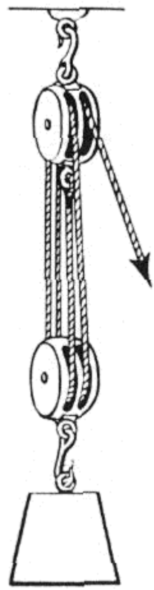


Figure 8-31
Two-Fold Purchase

Figure 8-32
Three-Fold Purchase

you need more mechanical advantage, so you put another luff onto the hauling part of the first luff, using a *midshipman's hitch* on the hook of the second luff.

Once again you exert 100 lbs. of pull. This comes out as 400 lbs. at the end of the first tackle. If there is 400 lbs. on the hauling part of the second tackle, a mechanical advantage of 4

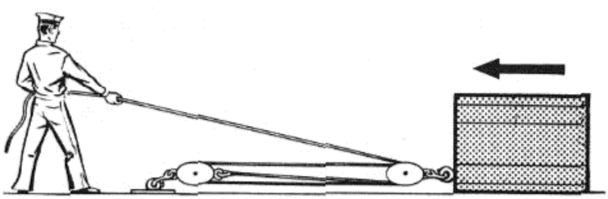


Figure 8-33 Single Luff

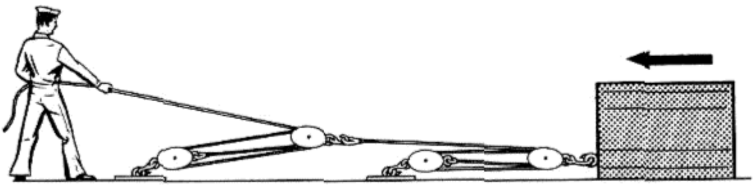


Figure 8-34 Luff Upon Luff

makes this 1,600 lbs. pull on the case. The final mechanical advantage has been the mechanical advantage of one purchase multiplied by that of the second: 4 x 4 -16; 16 x 100 lbs. 1600 lbs. This arrangement of purchases is called luff upon luff.

Choking a Luff

To hold a small tackle temporarily, the hauling part may be jammed between the standing block and one of the running parts. This is called *choking a* luff, and it should only be done when there is no other way of belaying the hauling part.

Figure 8-35 Choking the Luff

SHIPBOARD WORK

For hoisting or lowering light loads the usual arrangement is a *single whip*. This is merely a rope rove through a single standing block. The block may be secured at the deckhead or from a davit. If the load is heavier, a jigger or a handy billy may be used in the same way. This is a light tackle made up of two double sheave blocks.

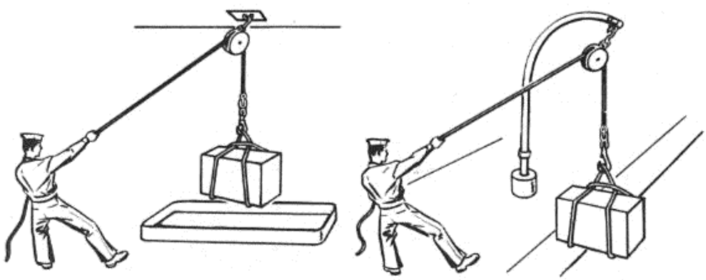


Figure 8-36 Single Whip

Derricks

A derrick is a pole or spar rigged with blocks and ropes in such a way that a load may not only be hoisted and lowered, but may also be moved horizontally. For example, a load may be lifted from a jetty up to the level of the deck, and across onto the deck.

In the old days, it was not uncommon for a seaman to have to rig a temporary derrick in some part of his ship. Nowadays, it is unlikely that a temporary derrick will be necessary except in an emergency, and in any case, unless you are a seaman of the boatswain trade, you will probably not have a hand in the rigging of any type of derrick. However, you may well be required to work with a derrick which is permanently a Part of a ship’s fittings, and for this reason it is as well to know how a derrick works.

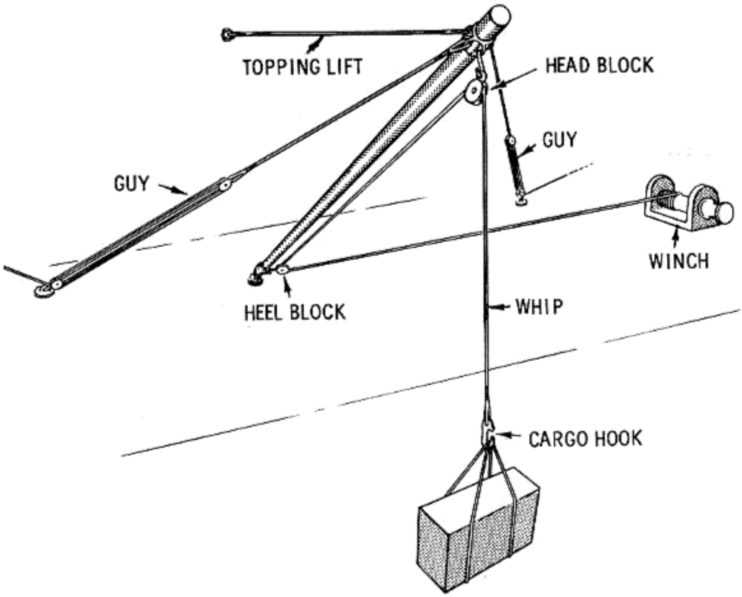


Figure 8-37 A Typical Derrick Rig

The whip is hauled by the winch (normally electrically powered). The load is hoisted and then the derrick is swung round by heaving in on one of the guy tackles and paying out the other.

In some derricks, the topping lift is rigged for running, and the derrick head may be raised or lowered.

Jackstay Transfer

Transferring stores or men from ship to ship at sea is a common practice. This is done by means of a jackstay. The jackstay is a stout rope or wire which is passed between two ships. A single hooked sheave called a traveller runs along it like a trolley, and on the hook of the traveller is slung the load to be passed. It is apparent that the jackstay must be kept taut otherwise the load would be dipped into the water

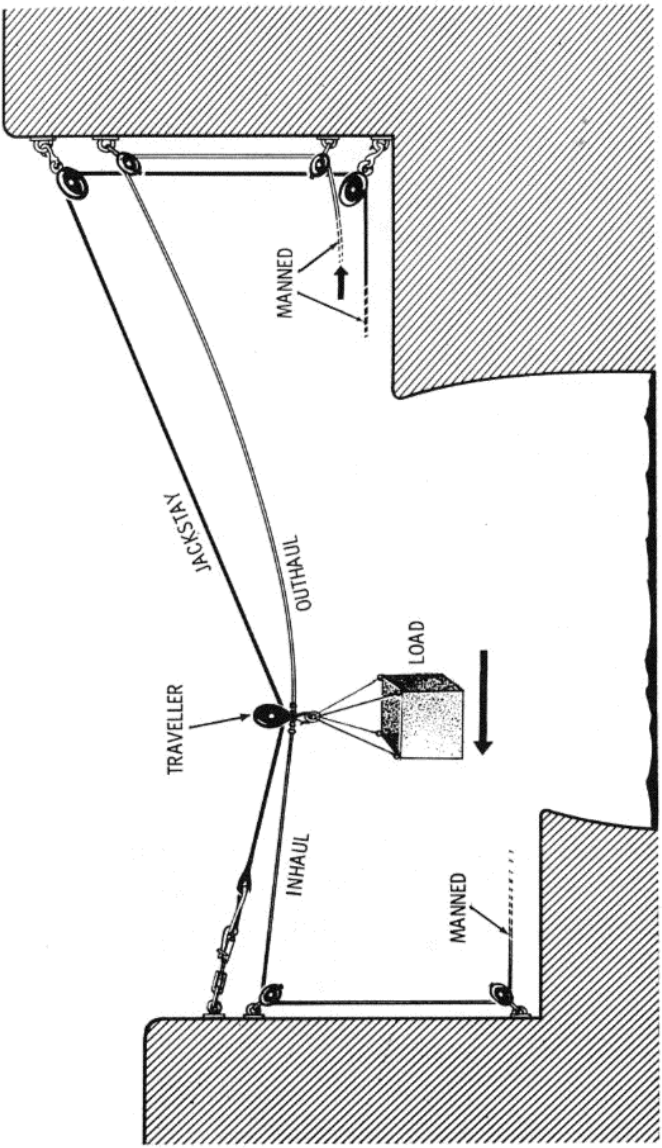


Figure 8–38 Jackstay Transfer

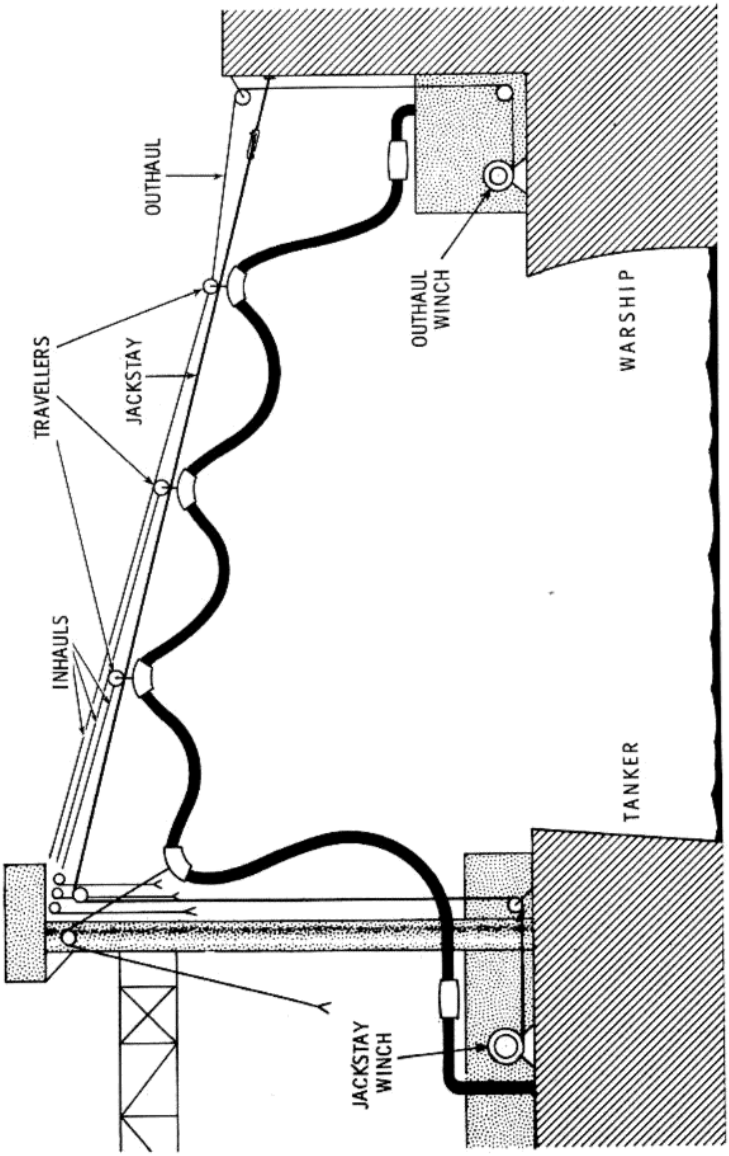


Figure 8–39 Fueling at Sea

when the distance between the ships closed, and the jackstay would part when the distance opened. Therefore, one end of the jackstay is manned. Also manned are the ropes which haul the traveller along the jackstay. These are called the *inhaul* and the *outhaul*.

Fueling at sea may also be done using a jackstay. In this case three separate travellers are used, and a bight of the fuelling hose is slung from each. Each of the travellers has an inhaul to the tanker, but only the one nearest the ship being fueled need have an outhaul. The hose itself serves as an outhaul for the others. In this case, a much stronger jackstay is used. As before, all the outhauls and inhauls are manned.

Berthing

A ship is said to *berth* when it comes alongside a jetty. It is held fast to the jetty by several wires and ropes. Each of these wires and ropes has a special name and a special purpose, and it is as well for you to know them since you will undoubtedly have to work with them.

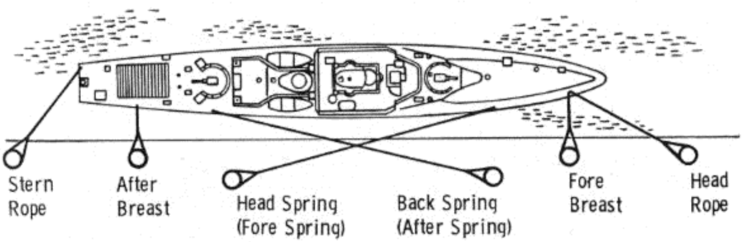


Figure 8-40

The *stern rope* and the *head rope* assist in keeping the ship from moving ahead or astern. They also help to keep her close alongside the jetty. The *fore* and *after breast ropes* are the main ropes used for keeping the ship close alongside.

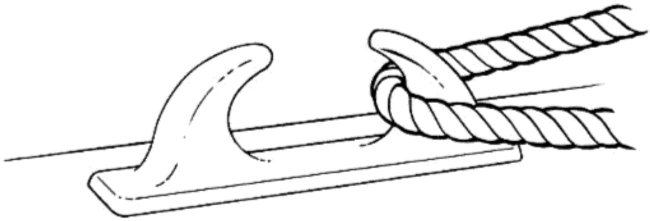


Figure 8-41 Nip

Any spring which leads forward is called a *back spring*, and any which leads aft is called a *head spring*. If only two springs are used, these are called the fore spring and after spring. The springs assist in holding the boat alongside although their main purpose is to prevent ahead or astern movements.

Ship's berthing lines are led over the ship's side through *fairleads* which have smooth edges to reduce the wear and the nip or sharp bending of the rope. On the outboard end there is normally a soft eye which may be slung over a bollard on the jetty. On the inboard end these ropes are turned up on bollards in a figure of eight manner. Often, the top cross between the bollards will be seized; if it is a wire the top cross *must* be seized.

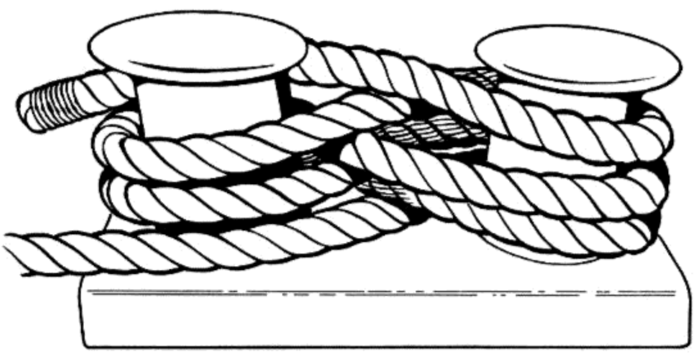


Figure 8-42

Figure 8-43
Placing the Eyes of Two Berthing Hawsers on a Single Bollard

It is sometimes necessary to place two eyes on one bollard ashore. If you were merely to place one eye over the other, then you would have no choice but to slip that eye first. However, if you heave the second eye up through the first before placing it on the bollard, you can let the eyes go in any order.

Often when coming alongside it will be necessary to use a capstan or winch to heave on one of the berthing ropes. When turns are taken on a capstan a rope is said to be *brought to.* Turns are taken as shown in Figure 8-44. When the capstan is running, great care must be taken that no *riding turns* form. If this happens, the rope will jam.

Ground tackle

A ship's ground tackle is that gear by which it anchors. This consists of an anchor and a length of chain cable. When it is anchored, a ship is held to the bottom, not only by the anchor but by the weight of chain cable which is lying on the bottom.

A ship will swing around her anchor and cable depending upon which way the tide is running and the wind is blowing.

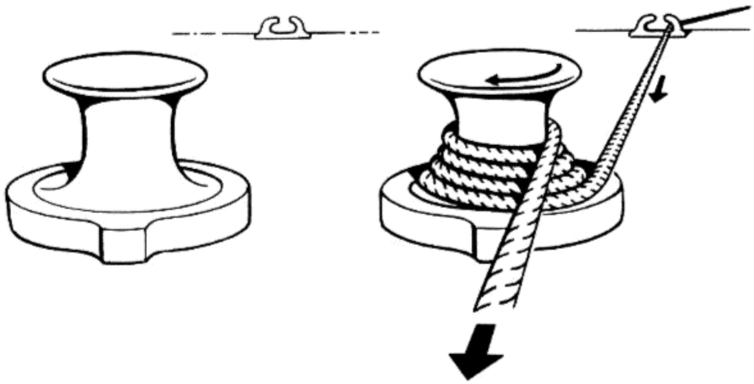


Figure 8-44 Using a Centerline Capstan

The total area of swing of a ship at anchor is called her anchor berth.

Most ships carry one anchor on each bow. These are called bower anchors. In a river or a harbour there may not be enough room for a ship to swing round a single anchor. In these cases the ship lets go one anchor and runs on letting out the cable and lets go the second anchor. The first cable is then hove in

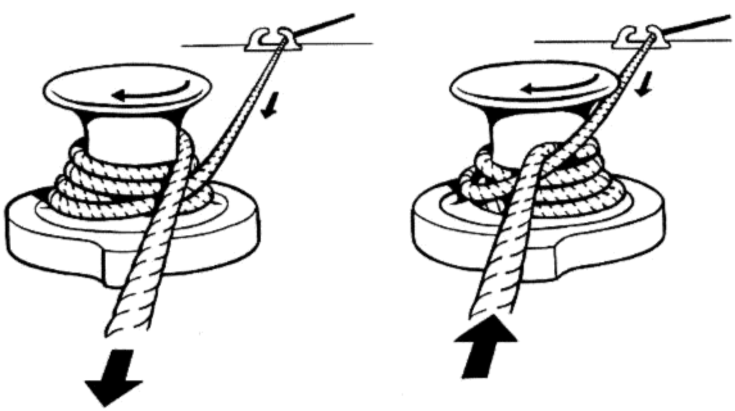
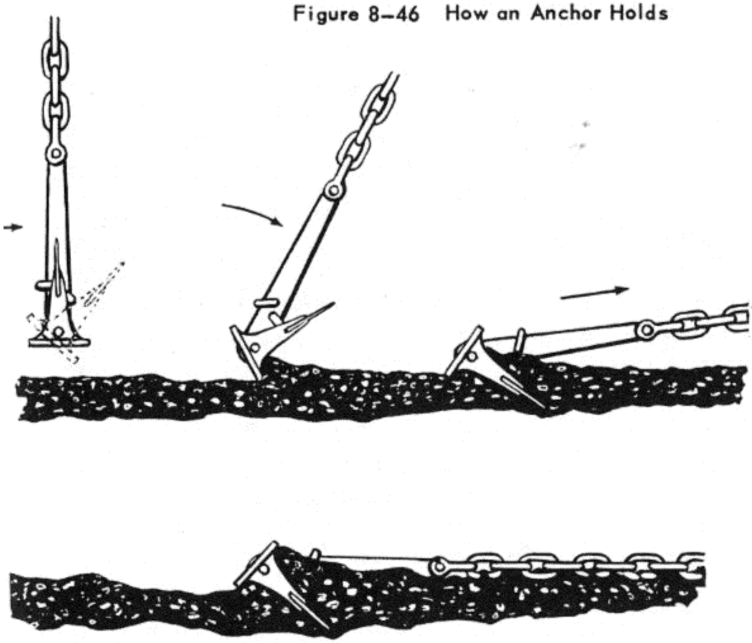


Figure 8-45 A Riding Turn

Figure 8–46 How an Anchor Holds



until the ship lies between the two anchors. This is called *mooring*.

A ship also uses her chain cable for securing to a buoy. This is called *coming to a buoy*. In this case one bower anchor is disconnected so that the chain cable is left free.

Safety

In all types of shipboard work, great care is taken to ensure the safety of the personnel. However, safety precautions are of no avail unless they are observed by every man. Most accidents are caused by using too small rope, by failing to mouse a hook, by standing in a bight of rope or by handling the running part of a purchase. Forewarned is forearmed. A ship at sea just cannot afford to lose the services of any man through a foolish accident.

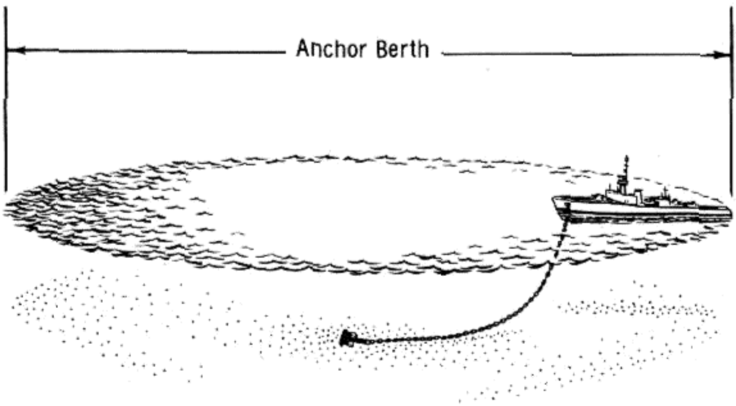


Figure 8-47 Ship at Single Anchor

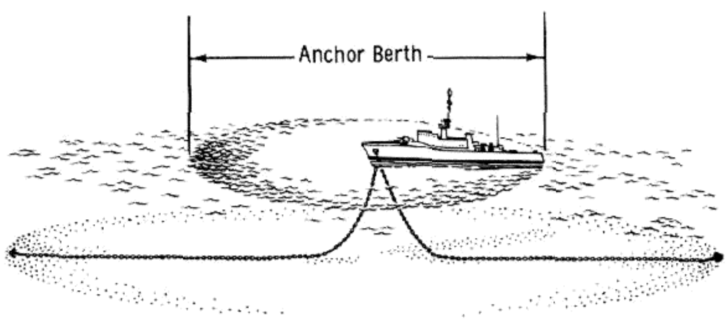


Figure 8-48 Ship Moored

Quiz

1. What are the types of rigging? What are their uses?
2. What are the various uses of slings?
3. Why is a cargo hook shaped the way it is?
4. What is mechanical advantage? Give an example.
5. What are the parts of a block?
6. What do you mean by rigging a purchase to advantage?
7. What is an easy method of computing approximate mechanical advantage? What influences this computation?
8. What is luff upon luff? What is its mechanical advantage?
9. What is the advantage of a derrick?
10. Why must one end of a jackstay be manned?
11. You are standing on the forecastle with the headrope in hand; the Forecastle Petty Officer shouts, "Bring to!". What do you do?

The answers to these questions may be found in Chapter 8. When you can answer all of these questions perfectly, you may consider yourself to have a fair grasp of this chapter.

CHAPTER 9

BOATWORK

Boats serve a variety of purposes in a modern navy, but while the Navy and its ships have changed drastically over the years, the uses of boats have not. Ships now perform tasks undreamed of in Nelson's day, yet the task for boats has changed very little. The only substantial change is that power boats are coming more and more into use; but, even so, pulling boats will be used in the Navy for many years to come.

A few of the tasks which a boat must perform are landing armed parties or libertymen; carrying stores; life saving; assisting ships to come to buoys; boarding enemy ships or ships in distress; recreation; and so on. The list is very long. These tasks must be performed in all kinds of weather conditions at day or night, and they may require to be done very quickly. it is necessary then for the Navy's boats to be very sturdy, to be able to carry a large load, to be reasonably fast, and to be very seaworthy.

Generally, the Navy's boats are divided into two classes: power boats and pulling boats. The power boats are either single or double screw, and are generally used as the working boats of the Navy. Pulling boats are carried only in older classes of ships, and they are used as seaboats, for utility jobs such as coming to a buoy, and for recreation and training.

All pulling boats may be rigged for sailing. In addition to

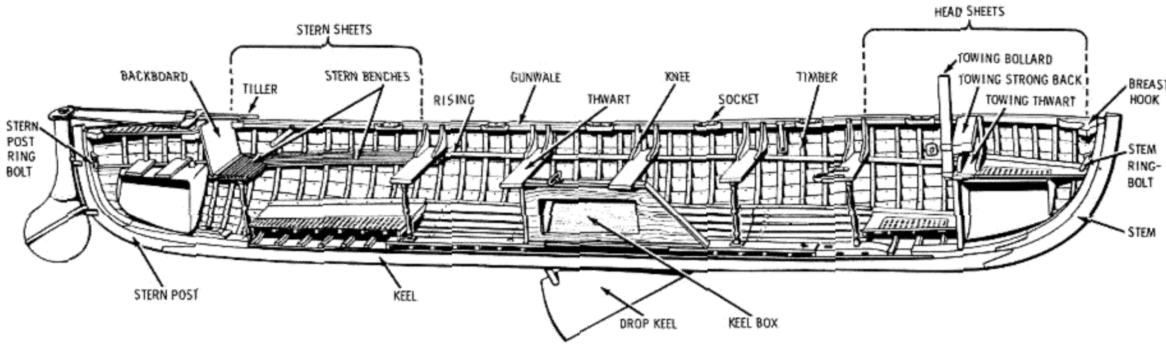


Figure 9–1 Longitudinal Section of a 27 ft. Whaler

its working boats, some ships carry a small sailing dinghy, This is used mainly for recreation or training but it may also be handy for such jobs as painting the ship's side and checking waterline fittings.

You have seen the tasks a ship's boat may be called upon to perform. It must be apparent that, at one time or another, men of all trades will be required to use boats, and to use them, it stands to reason that you must know something about them.

The first essential thing to know is what to call the various parts of a boat. Most ship terms also apply to boats. For example, there is "forward and aft", "port and starboard", "stem and stern" just as in a ship. But there are other more specialized terms in boats:

The function of most of these parts is self-evident, however, a few of them need special attention.

The Backboard

In a square sterned boat, this is normally fitted before the "transom", which is the board that makes the stern.

Headsheets and Sternsheets

In a boat, the headsheets is the platform right forward, and the sternsheets all that part between the after thwart and the backboard.

Socket

A crutch fits into a socket, and an oar fits into the crutch.

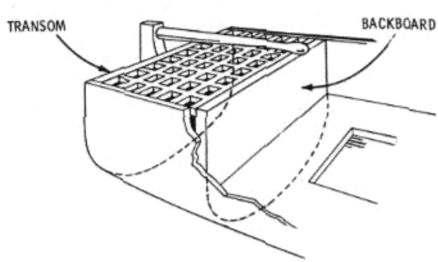


Figure 9-2

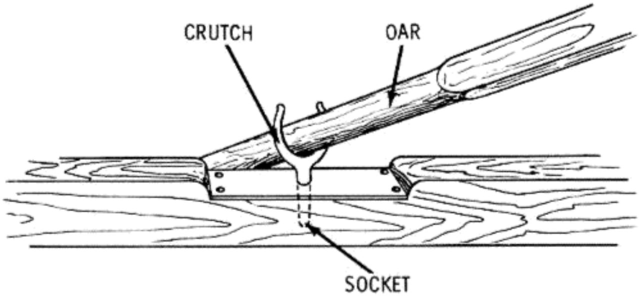


Figure 9-3

Drop Keel

Most sailing boats have an extra metal keel which may be dropped to counteract side slipping or leeway. In the raised position this keel fits into the keelbox.

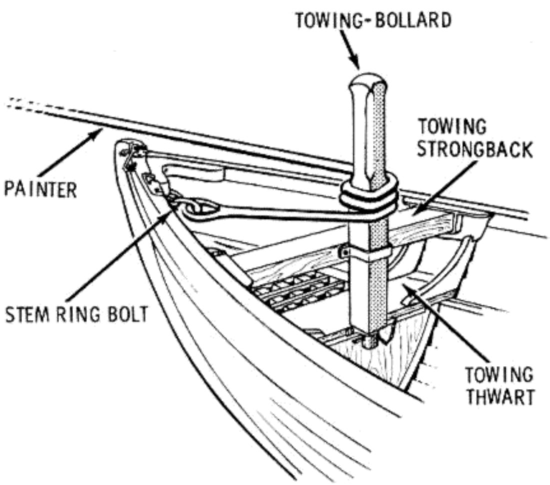


Figure 9-4 Use of a Towing Bollard With a Lightly Laden Boat

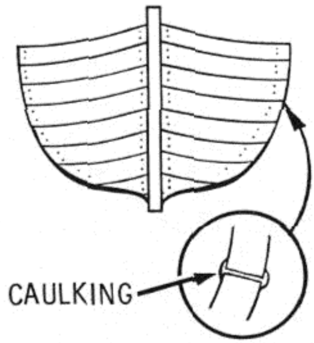


Figure 9-5 Carvel

Boat Construction

Generally, there are two main types of hull construction in wooden boats. They are called *clinker build* or *carvel build.*

The clinker built boat has its planks overlapping, bottom edge over top edge, from gunwhale to keel. The planks are joined to each other and to the timbers by copper nails clenched over washers or roves. For *single-skinned* hulls, that is, hulls with only one thickness of planks, this is about the strongest construction.

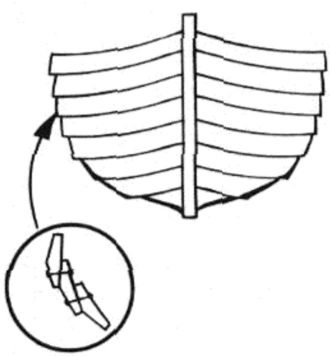
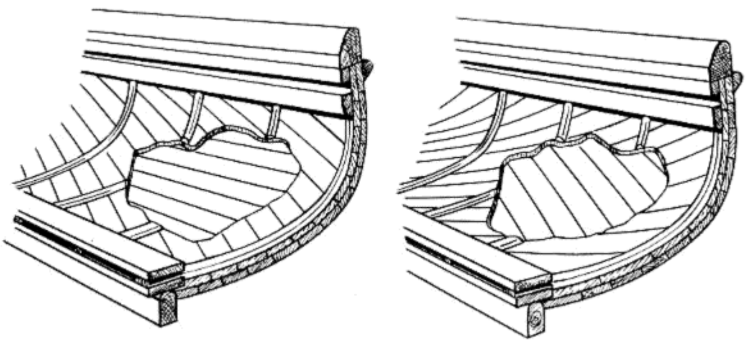


Figure 9-6 Clinker

’I’lie carvel built hull is one with a smooth outer surface. The planks are laid edge to edge flush with one another. The cracks or seams between the planks are stuffed with spun cotton or oakum to make the boat watertight. This process is called caulking. The planks are fastened to the timbers with copper nails.

In the single-skinned carvel built hull the planks are laid fore and aft, However, in the double-skinned hull, the outer skin is laid diagonally at 45° to the keel, and the inner skin may be fore and aft or diagonally laid the opposite way to the outer skin.



Diagonal Inner Shell
Fore and Aft Outer Shell

Double Diagonal

Figure 9-7

Besides these standard types, you may encounter a carvel built hull with a plywood outer skin, or a single skin hull of moulded fibreglass. In the future, it is probable that most boats will be made of this substance because of its strength and durability.

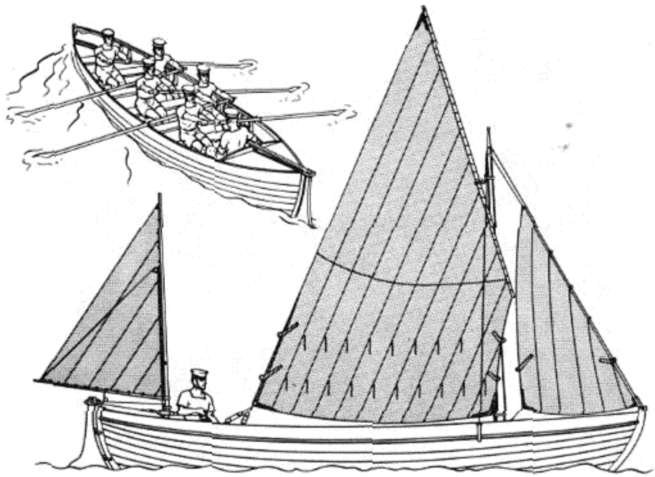


Figure 9-8 A 27 Foot Whaler Being Pulled and Sailed

Types of boats

There is only one type of pulling boat left in the RCN. This is the whaler. It is a clinker built boat, 27 feet in length with a six foot beam. It may be pulled by five men, one each on alternate oars, or it may be rigged for sailing.

The whaler is carried in the older classes of ships, and it is used as a seaboat or for recreational or training purposes. All new whalers being built for the Navy are of moulded fiberglass construction.

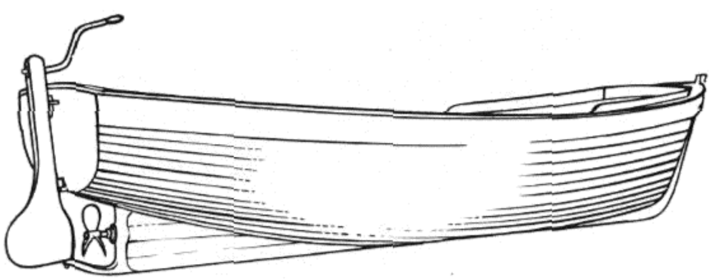


Figure 9-9 Motor Cutter

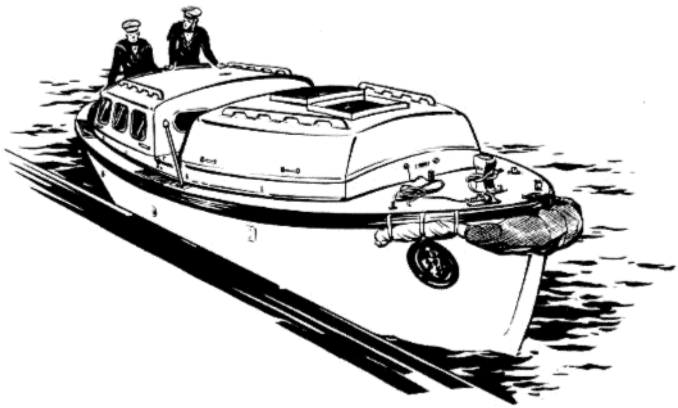


Figure 9-10 Motor Seabout

The 27 foot motor sea boat is a Canadian designed boat which is carried in DDE'S. It is used for rescue at sea duties and for harbour transportation. It is carvel built and powered by a diesel engine. The crew is normally three men: a coxswain, a bow man, and a stoker mechanic to work the engine. It can carry 36 men. The hull is "doubled ended", i.e. pointed at each end for better performance in rough water. Portable

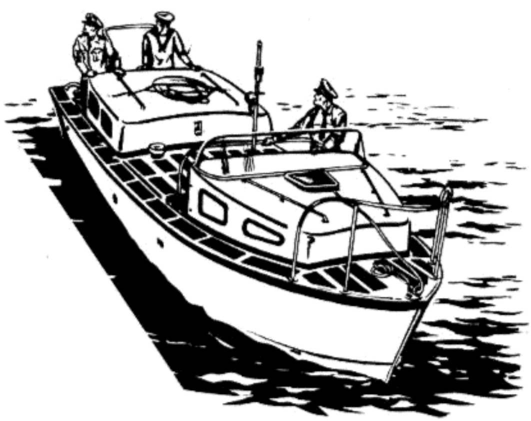


Figure 9-11 Pinnace

canopies can be fitted for harbour work for the protection of personnel.

The 25 foot motor cutter is a square-sterned, clinker built boat, which is being replaced by the 27 foot motor sea boat, This boat is still carried in the frigates and some older destroyers.

Hoisting and Lowering Boats

In frigates and destroyers, boats may be hoisted and lowered by hand. In destroyer escorts they are hoisted with a winch and lowered by hand, and in aircraft carriers they are hoisted and lowered by power. In this book, the methods of hoisting and lowering boats in a carrier will not be considered because it is unlikely that you would be involved in such an operation, without some training on the job. However, because of the relatively fewer men on a destroyer or frigate, it could fall to anybody's lot to have to help to man a boat's falls.

Before coming to grips with actual business of hoisting

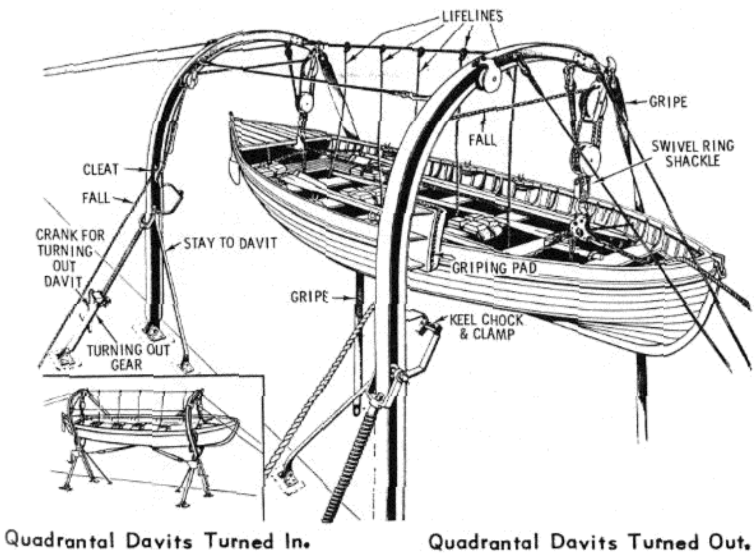


Figure 9-12

and lowering, it is necessary to examine the equipment which is fitted to make the job easier.

Davits

Boats are suspended on deck from two curved steel bars called davits, Of the many types of davits, the ones most commonly used in the RCN for its boats are called quadrantal davits.

From Figure 9-12 it will be seen that the keel rests in the keel chock and the gunwale against the griping pad when the davits are turned in. Turning in or out is accomplished by two men turning the two cranks in unison. Turned in, the boat is held against the griping pad by canvas gripes which cross diagonally outboard. Turned out, the boat is in a position to be lowered without touching the ship's side.

Disengaging Gear

Having lowered a boat to the water line, if the ship is underway or if a sea is running, it will be necessary to slip the boat from its falls very quickly and at just the right moment, or else the boat may capsize or strike the ship's side.

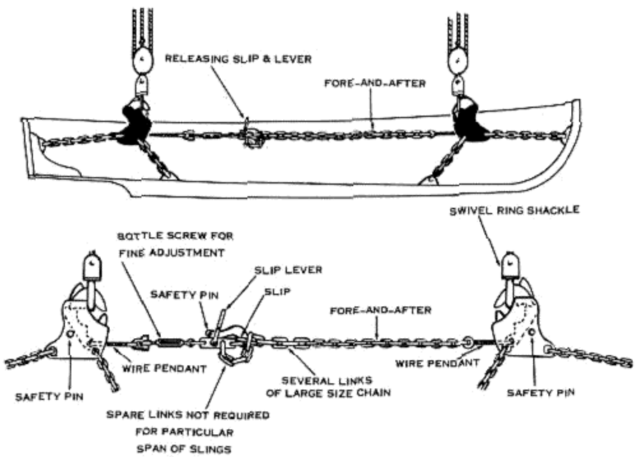


Figure 9-13

For these reasons, a special piece of equipment called *Robinson's disengaging gear* is fitted.

This looks like a complicated piece of equipment, but, like most really effective gear, it is quite simple. The principle is that so long as the fore and after chain is taut, the two hooks will hold the weight of the boat. However, as soon as you pull the slip lever and let some slack in the chain, the hooks tumble upward and the swivel ring shackle, which is on the end of the falls, is allowed to slip out.

In the diagram, (Figure 9-14) the black spots are pivot points. Consider first the left hand hook arrangement: piece "A" is held forward by the "fore and after", and hook "B" is prevented from pivoting around "b".

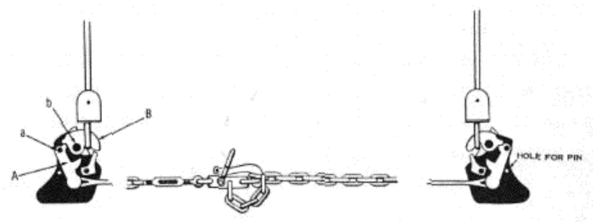


Figure 9-14

Pull the slip lever. There is now some slack in the fore and after, so piece "A" is free to rotate around "a". Hook "B" can now rotate around "b" and push "A" out of the way.

Figure 9-15

Now "A" has all the slack it needs, so it pivots around "a" until hook "B" is entirely free, and the swivel ring shackle comes free.

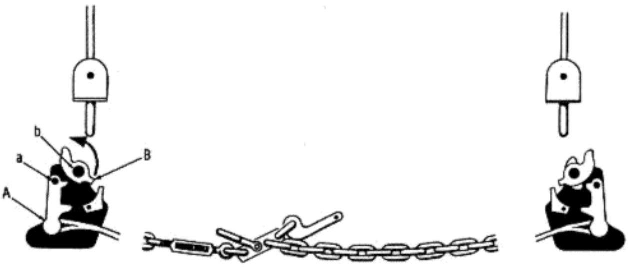


Figure 9-16

The Robinson disengaging gear is a very effective device, but, like all devices, it can go wrong, so there are certain safety measures. First of all, to prevent the boat from slipping inadvertently, there are "safety pins" fitted.

One of these pins is fitted behind piece "A" to prevent it from pivoting back even if the fore and after does become slack. This pin also keeps the hook "B" from opening when you are hooking on without the fore and after made up.

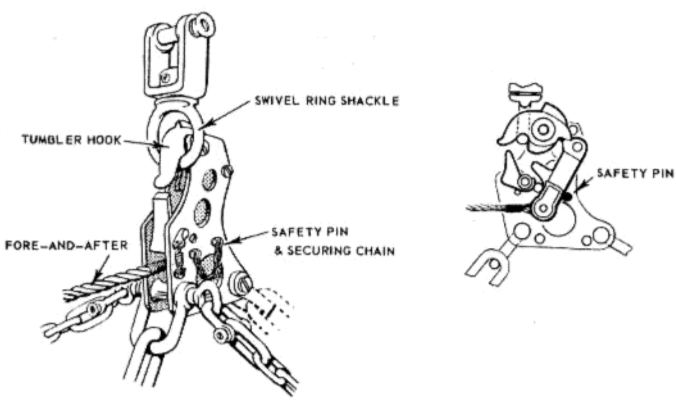


Figure 9-17

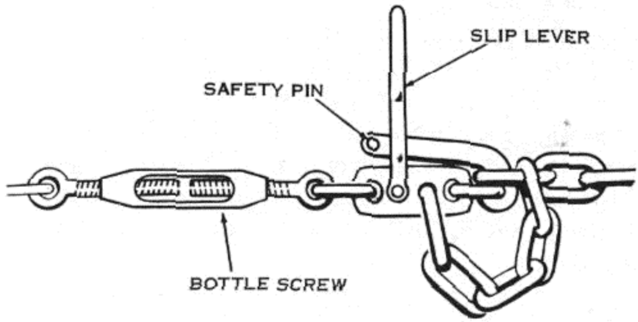


Figure 9-18

This pin cannot be removed unless the fore and after is taut enough to pull lever “A” forward and take the weight off the pin. By turning up the bottle screw in the fore and after, you eventually take the weight off the pins. The other pin is behind the slip lever to prevent you from pulling it inadvertently.

As you will see, one of the orders when you are getting ready to slip is “out pins”.

Boat rope

Suppose the ship was moving when the boat was slipped. Also, suppose for some reason the after disengaging gear didn’t work, what would happen?

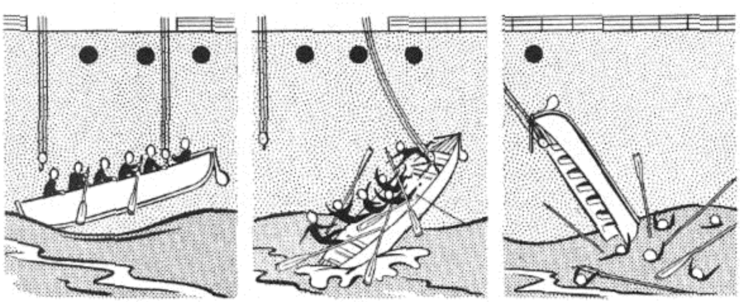
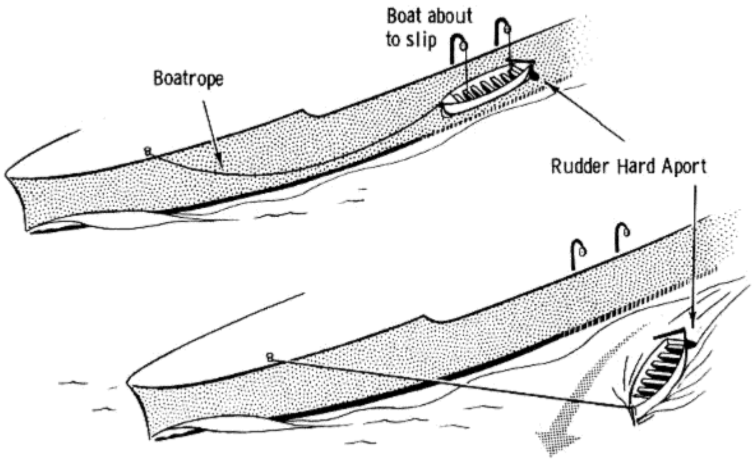


Figure 9-19

The bow would swing around until the boat was broadside to the sea and it would probably then capsize. This is called broaching to. If the ship's screws were turning, it could have disastrous results for the boat's crew.

To prevent this happening a rope is led forward from the bows of the boat to the forecastle of the ship. Now if the after disengaging gear fails to function, the boat will be towed along heading the same way as the ship, and it will not broach to.



Boatrope hauls boat clear
Coxswain will now order boatrope slipped

Figure 9-20

This rope is called the boat rope, and it has a number of other useful purposes. If the ship is moving when the boat is slipped, the coxswain of the boat may steer the boat away from the ship's side allowing the boat rope to tow him until he is well clear.

If the ship is stopped, the boat rope may be manned from the forecastle to pull the boat clear of the side. Naturally, the boat rope must be secured in the boat so that it can be slipped

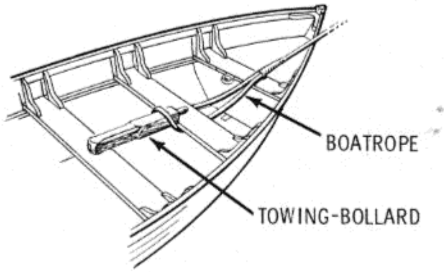


Figure 9-21 Method of Securing Eye of Boat Rope in Bow of Seaboat

easily. A soft eye is spliced in the outboard end and it is secured in the boat as in Figure 9-21.

When the coxswain wishes to slip the boat rope the bowman pulls out the towing bollard.

Lowering

Now let us see how a boat is lowered. A whaler is at the davit head, and the davits are turned in. The crew is in the boat. The disengaging gear is made up with the pins still in to avoid an accident. The boat is just as it is shown in Figure 9-13.

Slip the gripes.

This is a simple matter of knocking off a slip.

Turn out the davits.

Two men turn the crank handles.

Turns for lowering.

You can see in Figure 9-13 that the falls are turned up on cleats on the davits. Turns for lowering means that all but the final turns are taken off the cleat. One turn will not hold the boat, so the falls must be well *backed up* at this time. Backing up means to keep weight on the falls.

Start the falls.

Slowly and carefully you start to lower the boat by letting the falls surge around the cleat.

Lower away.

The boat is lowered more rapidly, but the men manning the falls must have such control that they could stop lowering at any time.

Avast lowering.

Stop lowering. The boat is a foot or two clear of the water.

Out pins.

The foremost and aftermost oarsmen remove the pins from the disengaging gear and hold up their hand to show that they have done so. The coxswain removes the pin from the slipping lever and shouts, "Pins out, Sir!"

Slip!

And the coxswain pulls the slipping lever while the crew bear the boat off the ship's side.

Hoisting

Hoisting a seaboat by hand is a task which involves all men in the ship who are not actually closed up on watch. The falls are led through snatch blocks and laid out along the deck.

The falls are manned evenly, that is, the same number of men on one fall as on another, with nobody between the falls. As each person finds his position on one of the falls, lie picks it up and awaits the first order. Meanwhile, the boat has hooked on, and the coxswain has reported that he is ready to be hoisted.

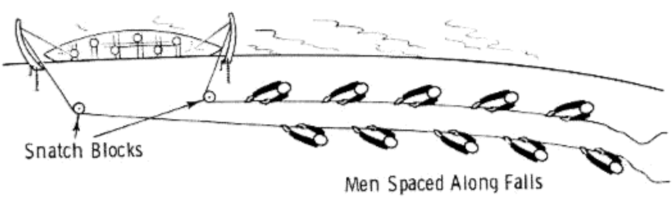
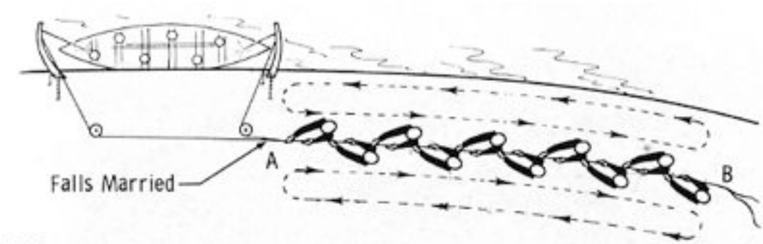


Figure 9-22 Positions for Manning the Falls



Hoist Away:
A man at "A" heaves on the falls till he gets to "B." He drops them at "B" and doubles back to "A" where he picks them up again and recommences hoisting. (The return route from "B" to "A" varies in some ships.)

Figure 9-23

Haul taut singly.

The slack is taken out of the falls, but nobody heaves. just sufficient weight is kept on the falls to keep them taut.

Marry

The falls are brought together by the two lines of men and r,ripped as one rope. The falls are still kept taut.

Hoist away

The men run away with the falls. As each one comes to the turning point he lets go his falls and doubles back to the start. (See Figure 9-23).

High enough

The men stop hoisting, but keep the weight on the falls.

Separate the falls

Keeping the weight, the falls are separated as they were before they were married.

Shipside fall (or midship fall) hoist

Depending on whether the boat is horizontal, it may be necessary to hoist a little more on one or other of the falls. When the boat is horizontal the order, "High enough", is once again given,

Pass the lifelines

The foremost and aftermost oarsmen in the boat pass their lifelines under the disengaging gear and over the davit head two or three times. They then take two or three turns around the,e turns and back it up. This jams the falls.

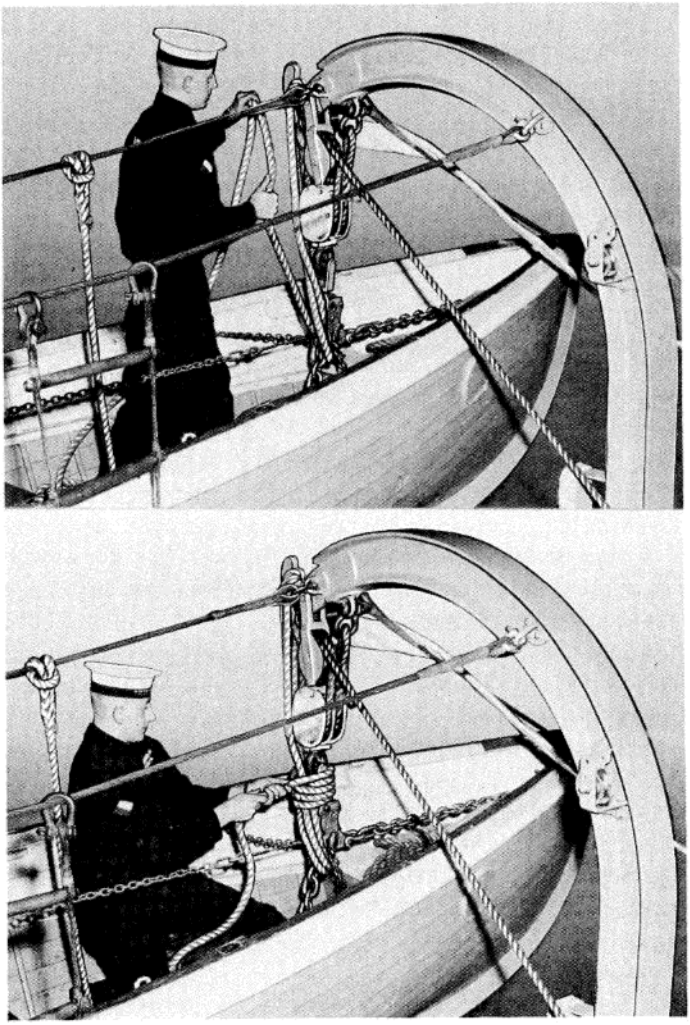


Figure 9-24 Passing a Lifeline

Ease to the lifelines

Very slowly and very carefully the falls are walked back toward the davits. The weight must be kept on them in case the lifeline doesn't hold.

Light to

When it is sure that the lifeline does hold, this order is given. With the falls in hand, walk toward the davit about 10 feet and then drop the falls. The hands at the davit will pass the falls over the davit fairleads and turn up on the cleats. The lifelines are then eased until the falls have the weight of the boat. In the Boat

In a boat being hoisted or lowered, you always wear a life jacket. No mechanical device is perfect, and if the disengaging gear fails to function, or the falls part, or the lowering team make an error, you are liable to end up swimming for it.

When you are being hoisted or lowered, unless you are performing some job to do with the hoisting or lowering, you should always have a firm grip on the life line. A boat accidentally dropping from a very small height can injure your

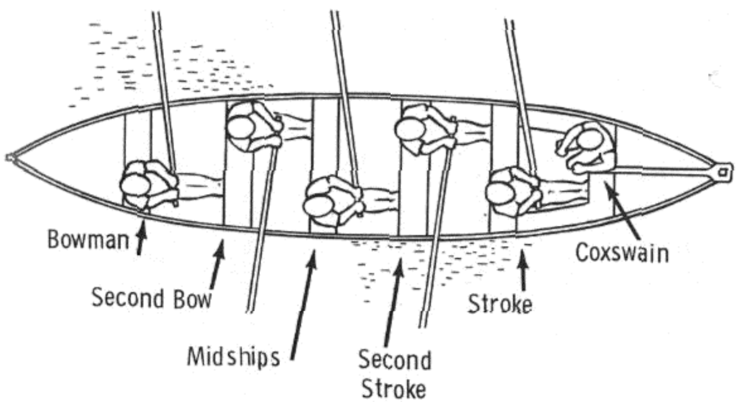


Figure 9-25 The Positions in a Whaler

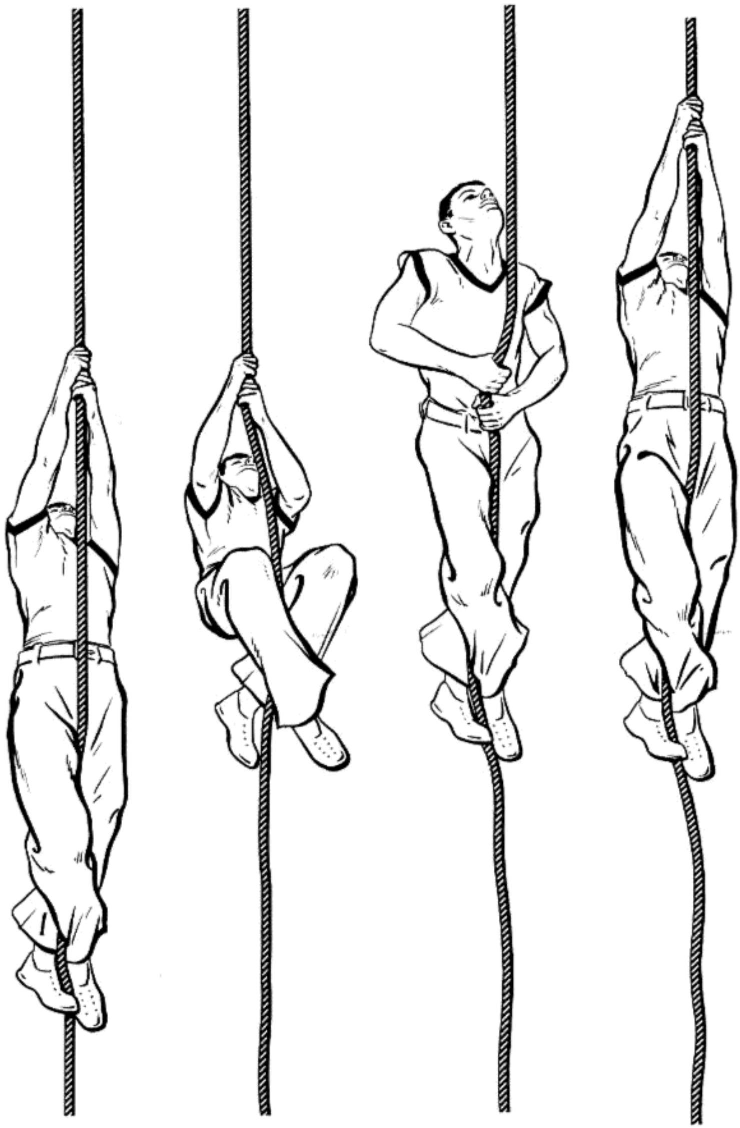


Figure 9-26 Climbing a Rope

back, perhaps break it. Also, never sit on the inboard side of a boat's falls while being hoisted or lowered.

To make the boat lighter for hoisting, the order, "Midship hands clear the boat", may be given when the boat first hooks on. Do not remove life jackets. In this case, everyone except the coxswain, stroke and bowman, clear the boat by climbing the lifelines,

Climbing a rope is simple provided it is done correctly. See Figure 9-26, Always leave your life jacket on until you are back in the ship.

Power Boat Hoisting and Lowering

In a power boat, the crew is made up of a coxswain, a bowman, a "stoker" (who is an engineering mechanic) and sometimes, but not necessarily, a sternsheetsman.

A power boat is hoisted and lowered exactly the same as a pulling boat, with one exception. A senhouse slip with a bottle screw is fitted at the power boat's davit head. Instead of passing a lifeline when the boat is hoisted, the slips are fastened with the bottle screw turned right up, and the order is given, "Ease to the slip); light to".

When the boat is to be lowered, the bottle screw is turned out until the weight comes on the falls. The slip is slipped, and the boat is then lowered in the normal manner.

In ships fitted with a winch, lowering is still done by

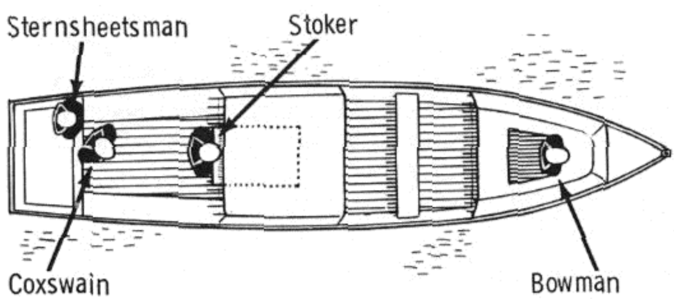


Figure 9-27 The Positions in a Powerboat

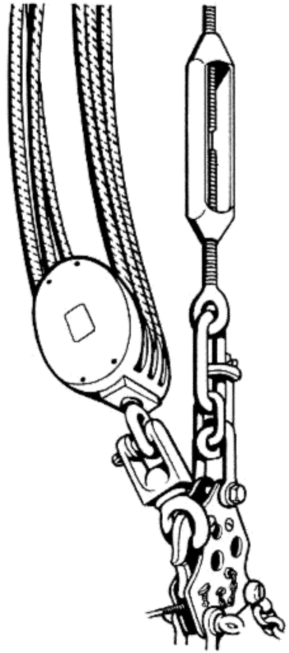


Figure 9–28 Bottle Screw &
Slip taking the Weight

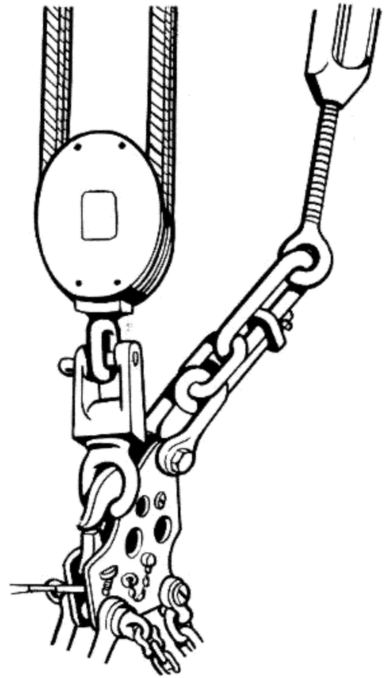


Figure 9–29A
Falls Taking The Weight

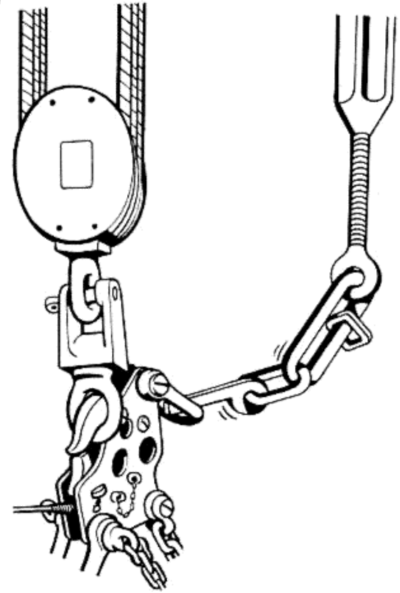


Figure 9–29B
Hook being Slipped

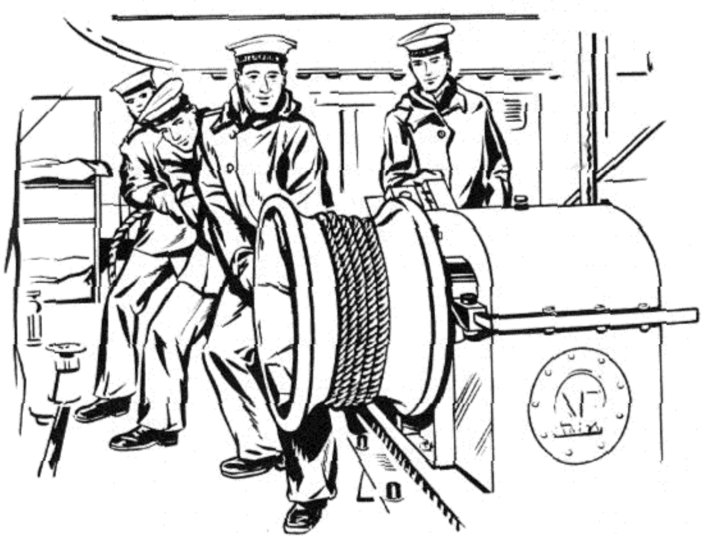


Figure 9-30 Hoisting With a Winch

hand. Hoisting is almost the same except that the falls are taken to the two drums of the winch and backed up. The boat is kept in the horizontal position by surging on one or other of the falls as necessary. Surging means allowing the rope around the drum to slip by easing the weight of backing up.

In hoisting and lowering boat. as in other rope work, there ,ire certain seamanlike terms used to make orders exact and easily, understood.

Hansomely means to work more slowly. For example, in the final stages of hoisting, when the falls are separated, the order, “Shipside fall hoist away handsomely”, would mean that the bow of the boat is to be hoisted very slowly. Figure it out.

Roundly means to work more quickly than normal. If you are lowering, and the order is given, “Roundly, foremost fall”, it means that the bow of the boat is lowering more slowly than the stern and you want to make the boat horizontal while still on the move.

Avast means stop. For example, avast lowering means stop lowering but keep the weight on the falls.

In boat work there are two simple but extremely important hints:

1. When you are backing up a fall or a lifeline, really back it up. Put your weight to it. Accidents caused by not backing up normally injure the people on the falls as well as those in the boat.
2. Listen carefully for orders. Do not just follow what everyone else is doing.

Boats' Crews

The coxswain is in complete command of a boat. He is responsible for the safety of the boat and every person in it. It doesn't matter if the boat is carrying a group of chief petty officers, and the coxswain is a leading seaman, he is still in command of the boat. The only exception to this rule is that an officer may relieve the coxswain of his command, but no officer would do this without some very good reason.

It is an old, old saying that "a ship is known by its boats", and it holds good to this day. Suppose you are anchored in a harbour with other ships. A boat from another ship comes alongside. It is dirty and messy, and the crew is dressed in a variety of rigs from working rig to number two's. In coming alongside, the boat overshoots and strikes your ship's side. What would you think of the ship from which this boat comes? The chances are one hundred to one that that ship is just as messy and dirty. If you have anything to do with your ship's boats, remember, the impression your boat makes reflects what other people will think of your ship, *and perhaps your whole Navy,* and generally this impression is the truth.

When you are a passenger in a boat, you must obey certain rules. These rules are laid down for your own safety, and to assist the boat's crew in its job.

1. Do not smoke in boats. In power boats this is dangerous because of the presence of fuel. In all boats it makes a mess,

and may scar the woodwork. No good coxswain would dream of tolerating smoking in his boat.

2. As a passenger, you must sit where you are ordered in a boat. The most senior passengers normally sit furthest aft. The coxswain will place his passengers in positions to give him a good trim. It is dangerous to stand in a boat. It is unseamanlike and may be dangerous to have hands or arms on the gunwales of a boat. Your whole body should be inside the boat. Further, when entering or leaving a boat, do not step on the gunwale.

3. Do not skylark in a boat. Often, coming off leave, men Lire in the mood for skylarking. You must get this out of your system ashore. The coxswain has enough to think about giving you a safe passage without having to worry about his passengers moving about, upsetting his trim, and generally being a nuisance.

4. Do not enter or leave a boat until you are ordered to do so. When the coxswain is sure his boat is quite prepared, he will tell you to carry on in or out of the boat. Normally, junior people enter a boat first and leave it last. If you are waiting for a boat together with a chief petty officer, say, and an officer, as soon as the coxswain indicates he is ready, you should enter and seat yourself without waiting for the other passengers. This is a matter of courtesy which is based on the fact that senior persons deserve to endure the discomforts of a boat for the shortest time.

Probably the worst sight in the Navy is a power boat stalled away from its ship with its crew, in all manner of rig, lounged about smoking, and a fender and a rope end over the side. If you happen to be in such a boat, do not be surprised to find yourself job hunting in your home town sooner than you expect.

Marks of respect are paid in boats just as they are ashore. The seniority of a boat is determined by the rank of the most senior person in a boat. When a junior boat passes a senior boat, the coxswain of the junior salutes, and all passengers

in that boat sit at attention. The officer in the senior boat returns the salute.
To conclude

If you remember nothing else about boats, remember this: a boat is like a wife. A good seaman treats his boats with care and respect because he knows that he would be lost without them. A bad seaman treats his boats carelessly and then complains bitterly because they won't work.

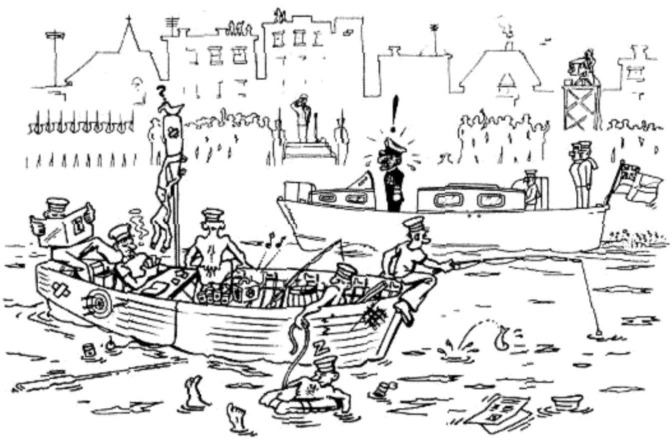


Figure 9-31

QUIZ

1. What are some uses of boats in the Navy?
2. What is a backboard? Gunwale? Drop keel? Thwart?
3. What are the two types of boat hull construction? What are their characteristics?

4. What is the main advantage of a clinker built boat over a carvel?
5. What are the types of boats used by the RCN, and what are they used for?
6. What sort of davits are used in the RCN and how do they get a boat clear of the ship's side?
7. Why is Robinson's disengaging gear used?
8. What is the object of safety pins in Robinson's disengaging gear?
9. Why is a boat rope used and how is it secured in the boat? Why is it secured in this manner?
10. What does "start the falls" mean?
11. What does "marry" mean?
12. What does "light to" mean?
13. What is meant by the term "handsomely"? "Roundly"? "Avast"?
14. What authority does the coxswain of a boat have?
15. How are marks of respect paid in a boat?

The answers to these questions may be found in Chapter 9.

CHAPTER 10

A B C D

A B C D stands for “Atomic, Biological and Chemical Protection; and Damage Control”. This subject deals with how to keep your ship afloat and yourself alive if you are attacked by an enemy or if you are damaged in any other way. It is obvious then, that it is important to every person in the Navy, because lacking knowledge in this subject is about the same as committing suicide in the event of your ship being attacked.

DAMAGE CONTROL

Damage control is particularly concerned with keeping a ship in efficient fighting condition in spite of damage. The first thing which must be done is to prevent the ship from sinking and, after that, it is necessary to keep the ship upright and steady so that the weapons may work most efficiently. The most important principle in damage control is that of ship stability.

Have you ever considered how a ship floats? It is really a very simple principle which may best be shown by an experiment.

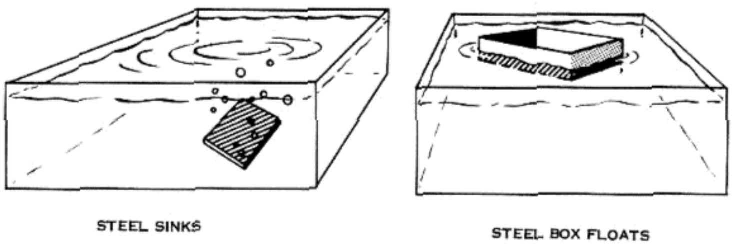


Figure 10-1

If you put a piece of iron in water, it sinks. Yet, if you were to make this same piece of iron into the shape of a water tight box, it would probably float.

Now, suppose you fill a small tank brim full with water, so full that you cannot get another drop in without the tank overflowing, and suppose you now put in the piece of iron and let it sink. How much water overflows? It would be the same volume of water as the volume of the piece of iron. In other words, if you could take the water and freeze it into the shape you wanted, you would just be able to make a piece of ice the same dimensions as the piece of iron ... no more and no less. You say that the iron has displaced its own volume in water.

Suppose you now make your iron box and float it in the brim full tank. How much water overflows this time? It would

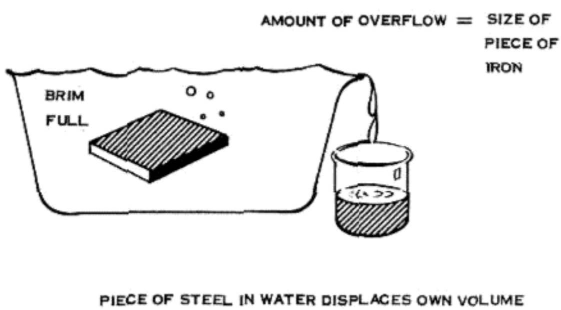
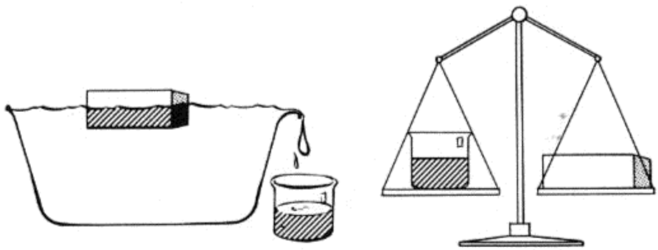


Figure 10-2



STEEL BOX DISPLACES VOLUME OF BOX BELOW WATER SURFACE

Figure 10-3

be the same volume of water as the volume of that part of the box which is below the surface.

And now comes the part that may seem amazing until you have thought about it for a time. The weight of the water which overflowed when the iron box was floated is equal to the weight of the iron box! This demonstrates an important rule in ship stability; in every case the weight of water *displaced by* a floating object equals the weight of that object.

A good example of this principle is the iceberg. Ice weighs only a little less than water, so you might expect that it would float very deep in the water. You would be right. Seven-tenths of an iceberg is below the surface of the water.

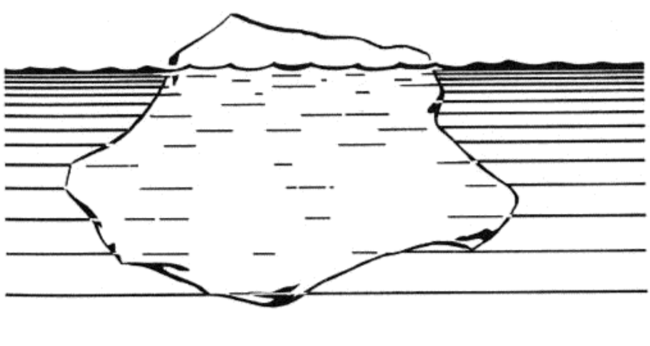


Figure 10-4 Iceberg

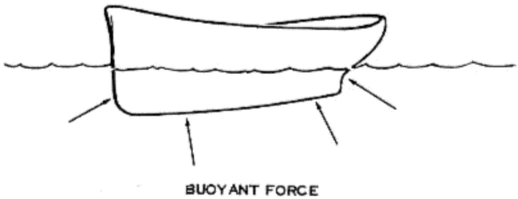


Figure 10-5

But this is not the whole story. Going a step further you realize that when an object floats in water, something is holding that object up. It is, of course, the buoyant force of the water.

If you took the same object and balanced it on the end of a pencil, once again some force would be holding the object up. It is apparent that since both these forces are doing the same job that is, holding up the object they must be equal forces. The only difference is that one of the forces is acting all over the bottom of the object and the other is only acting at one point.

In practice, to make it easier to understand, it is always said that the buoyant force of water acts through one point

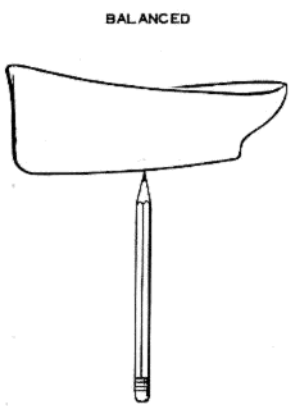


Figure 10-6

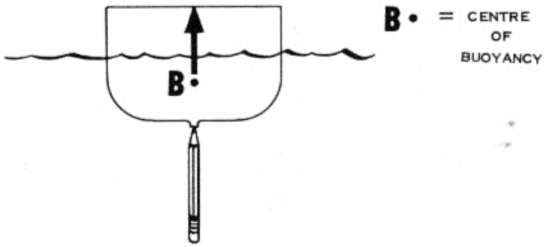


Figure 10-7

just as the force of the pencil. The point through which this force acts is called the *centre of buoyancy,* and it is somewhere inside the hull.

Suppose you wanted to balance this object at an angle to the upright position. You would have to put the pencil at a different place, but when you found that place, the object would still balance perfectly. It is easily seen, then, that the *centre of buoyancy may move about depending upon the angle of the floating object.*

Now suppose you take the same object and hang it from a string at the end of a pair of fish scales. There would be one point where the object balanced nicely, and the whole weight would show on the scales. It is as if the whole weight of the object were acting through this point of balance. Once again, to make it easier to understand, it is said that the whole weight

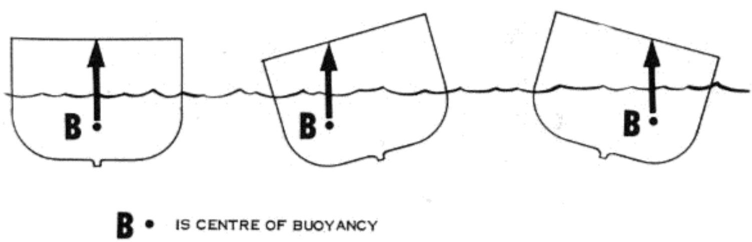


Figure 10-8

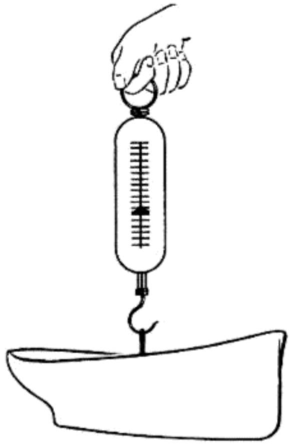


Figure 10-9

does act through this point, and we call the point the *centre of gravity*. But this time, no matter which way the object is tilted, you still get the same reading on the scales. So the centre of gravity is always in the same place unless we actually after the weight of the object.

Now apply this new found knowledge to a floating ship. It is obvious that a ship has a centre of gravity and a centre of buoyancy, and it is easy to see that if the ship is floating upright, the buoyant force and the force of the weight of the ship are acting up and down in the, same straight

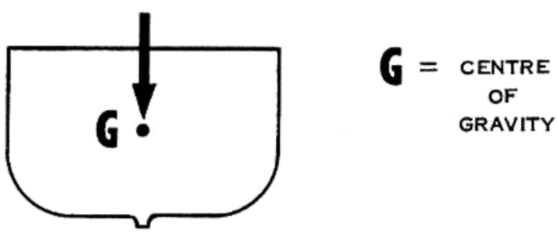


Figure 10-10

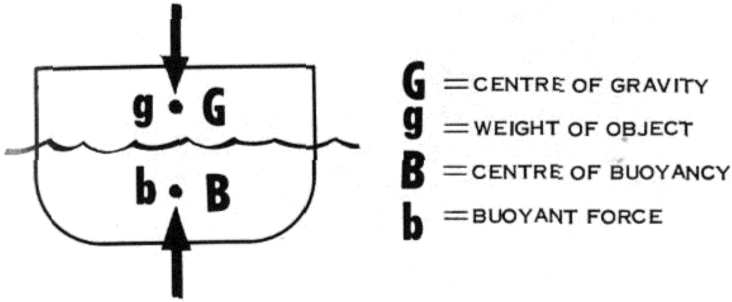


Figure 10-11 Normal Condition

line. It must do so because the ship balances horizontally at the tip of a pencil and hangs horizontally from the fish scales.

Suppose now that the ship is tilted off at an angle. The centre of buoyancy shifts, but the centre of gravity remains in the same position.

The buoyant force is pushing one side of the ship upward, and the weight is pushing down in the middle. You can see what happens. It is the same as if there was a man pulling down with one arm and pushing up with the other. The ship rights herself. The total force trying to make the ship come

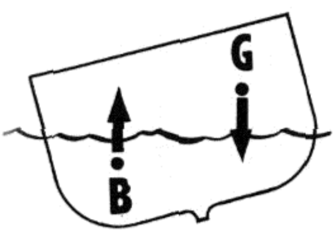


Figure 10-12 Ship Tilted

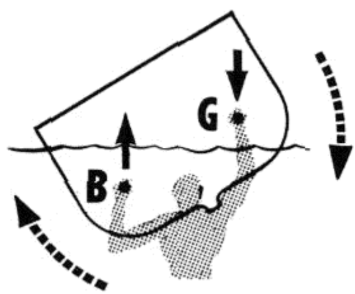


Figure 10-13 Righting Moment

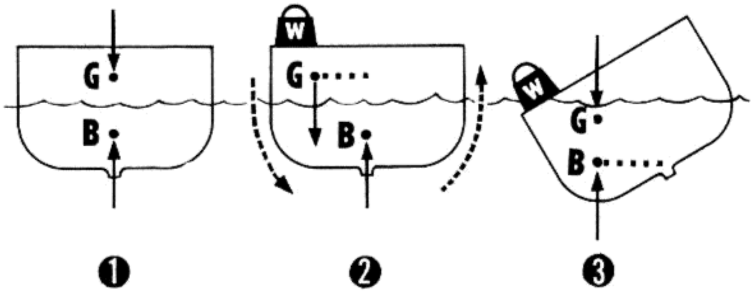


Figure 10-14 Tilting Moment

upright is called the *righting moment*.

Suppose, now, that you actually add a large weight to one side of the ship. This will make the centre of gravity move toward that side. You have righting moment in reverse call it tilting moment because it makes the ship tilt over until the buoyant force is in line with the weight force again.

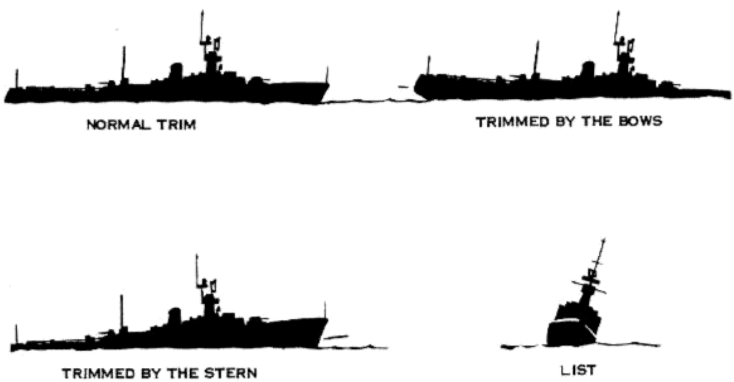


Figure 10-15

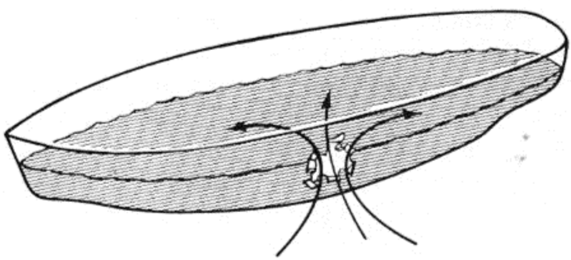


Figure 10-16

There are exact terms to describe all these things that may happen to a ship: When a ship tilts toward one side or another it is said to *heel*. When the heel is caused by more weight on one side than the other, the heel is called a *list*. If a ship's bows are lower in the water than the stern, the ship is said to be *trimmed by the bows*. When the stern is lower, it is said to be *trimmed by the stern*. When the bow and stern are both at the correct depth, the ship is said to be in *normal trim*.

You have now seen the basic principles of ship stability. It is of vital importance that they be understood before trying to learn anything further about damage control.

Watertightness

You saw in Chapter 5 that a ship is divided up into *compartments*. Consider again what was said in that chapter. If a ship didn't have compartments, and it received a hole in the side it would soon fill up and sink.

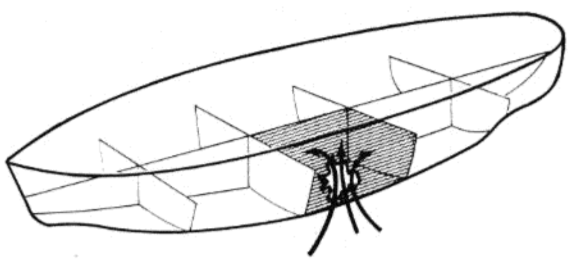


Figure 10-17

If it does have compartments, the flooding is restricted to whichever compartment the hole is in, and the ship doesn't sink. So a ship is divided up into compartments by watertight bulkheads. Since it is necessary to get in and out of all the compartments in a ship, there must be a door or a hatch into each compartment. It is often necessary for men to be in these compartments with the door or hatch shut so there must be some sort of ventilation.

You can easily see that if all the doors, hatches and ventilation openings to the various compartments were left open, a holed ship would fill up just as readily as if there were no watertight bulkheads at all. So there must be some control to the opening and shutting of doors in a ship. This is called *watertight discipline*, and it is effected by marking a] I the doors and hatches in a ship according to how dangerous it would be to leave them open if the ship were damaged and flooding.

The risk marking system is very simple. Every door, hatch, and ventilation opening which could be risky to leave open is marked with red or blue paint. Red means of immediate flooding risk to the ship; blue means of secondary flooding risk to the ship.

When there is an emergency you will hear the pipe, "Close red and blue openings". The red openings should be shut first, then the blue ones.

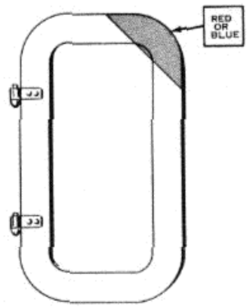
But even if there were no emergency it would be dangerous to allow doors and hatches to be opened at random, so there is a control system used all the time. In this system, doors and hatches and ventilation openings are lettered according to when they may be opened.

"X" means that you must ask the permission of the Officer of the Watch before you open the door.

"Y" means that you may open the door to pass through, but you must reclose it at once.

"Z" means that the door may normally be left open.

"ROUTINE" means that there are special instructions posted along side the door.



igure 10–18 Risk Marking

These control markings also apply to hatches and ventilation openings.

These risk and control markings, if they are observed, may make a ship ready for almost any damage it might sustain, but when the damage does come, it must be discovered quickly, and something must be done about it. For this reason, there is an organization in the ship to cope with damage, to keep the ship from sinking, and to keep tier upright.

The A B C D organization consists of a team of men which, as you will see later, is also responsible for the atomic, biological, and chemical protection of the ship. Naturally, the Captain is finally responsible for the safety of the ship, but he delegates the responsibility for A B C D

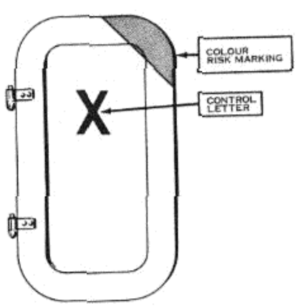


Figure 119 Control Marking

organization, coordination and training to the First Lieutenant or Executive Officer. In an action, however, the Engineer Officer takes over the coordination of the team, for the Executive Officer must be ready to take command of the ship should the Captain be a casualty.

The job of the A B C D team is to find damage quickly after it occurs, to take immediate steps to prevent its spreading and, if possible, to correct it. The nerve centre of the team is A B C D headquarters, normally called H.Q.1. Here, track is kept of the various parts of the team and what they are doing so that the condition of the ship is known at all times, and necessary measures may be ordered quickly. H.Q.1. keeps the Captain informed on the general situation and advises him on A B C D matters.

Every seaman may have to take part in the duties of the A B C D team. These duties may include firefighting, pumping and flooding, strengthening of bulkheads of flooded compartments, stopping leaks, or any other job vital to the safety of the ship. Therefore, it is essential that every man know his ship perfectly. It is not enough just to know the places in which you live and work because you will probably be required to get quickly to an entirely different part of the ship, and the success of your job when you get there will depend upon your knowledge of that compartment and its fittings. The actual survival of the whole ship may depend upon how well you do your job on the A B C D team.

It is not practical to keep the whole A B C D team at the best state of readiness at all times, nor is it necessary. It is easy to see that a ship must be in a better state of readiness for damage if it is steaming through submarine infested waters in wartime than if it is just making a passage in the open sea in peacetime. Therefore, the A B C D organization must be capable of keeping different states of readiness.

There are normally four states of readiness to cover all the circumstances in which a ship may find herself. These states are shown in the following table. Basically they are the same throughout the Navy although they may vary slightly from ship to ship.

State of readiness	*Circumstances in which assumed*	*What happens*
I	You know that an attack is coming and that you may sustain some damage.	The complete organization is closed up and ready for immediate action.
II	You think that an attack is probable. You are within range of the enemy.	A B C D organization in two watches, but each watch is ready for immediate action.
III	It is possible that you nay be attacked, but you have no definite knowledge of an attack coming.	The organization is only partially manned by watchkeepers, but a strict eye is kept on watertight discipline.
IV	It is unlikely that you will be attacked without some warning. Peacetime cruising.	A watch is kept in A B C D headquarters. Watertight discipline is relaxed as much as possible to make work easier and living more comfortable.

All of these states may be used in peacetime. For example, when the ship is passing through a tricky channel or near the shore damage may occur, so a high damage control state is assumed.

Know Your Ship

There are many rules and regulations in the Navy which are merely good for discipline, or are designed only to make life more comfortable. The rule *know your ship is not* one of these. Far from being smart, it is the height of stupidity to ignore this rule because it is a matter of life or death; not

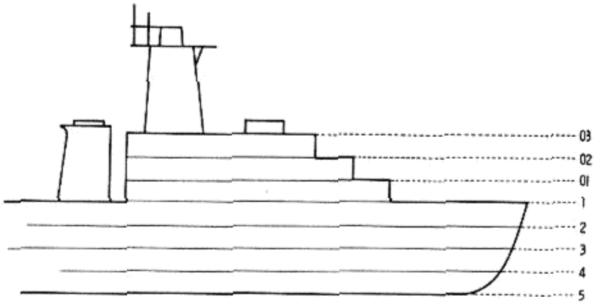


Figure 10-20

only for yourself, but also for everyone else in the ship. It is safe to say that under certain circumstances (which are almost bound to arise in wartime) the rule *know your ship* is more important than arriving back off leave when the ship is under sailing orders. It is certain that many ships have been lost both in war and peace because someone it only takes one did not know his ship.

To make it easy for you to know your ship, and so that you can report accurately the position of any damage, a simple system has been devised. This is called the *Standard System of Marking.*

Starting at the weather deck, decks are numbered up and down as in Figure 10-20. Each section between watertight bulkheads is marked by a letter starting forward as is shown in Figure 10-21. So you can say that the space on deck number "4" in section "D" is called "4D".

Now there may be more than one watertight compartment within a section, so they are designated from forward and

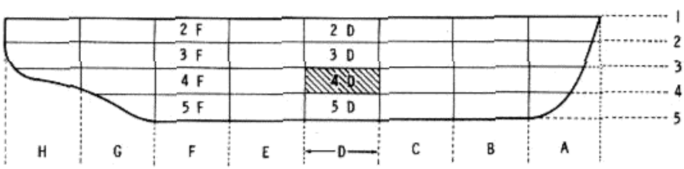


Figure 10-21

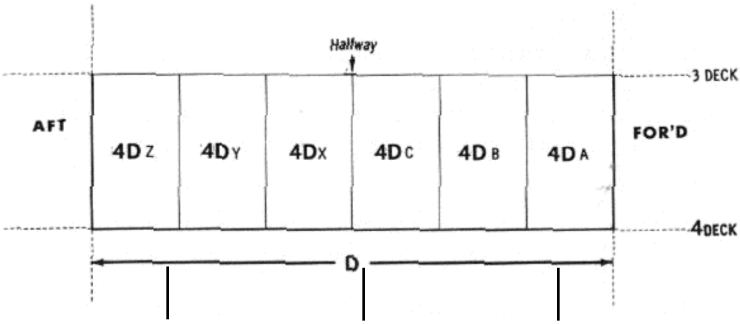


Figure 10-22 Sideview 01 Section 4D

aft toward the halfway point with small letters as shown: You can now say that the second subsection of the "D" section on number "4" deck is compartments "4DB".

But suppose this subsection "B" is divided athwartships into compartments. Then starting at the centreline and working outwards you number the starboard hand compartments with small odd numbers, and the port side compartments with small even numbers as shown in Figure 10-23, (looking down upon subsection "4DB").

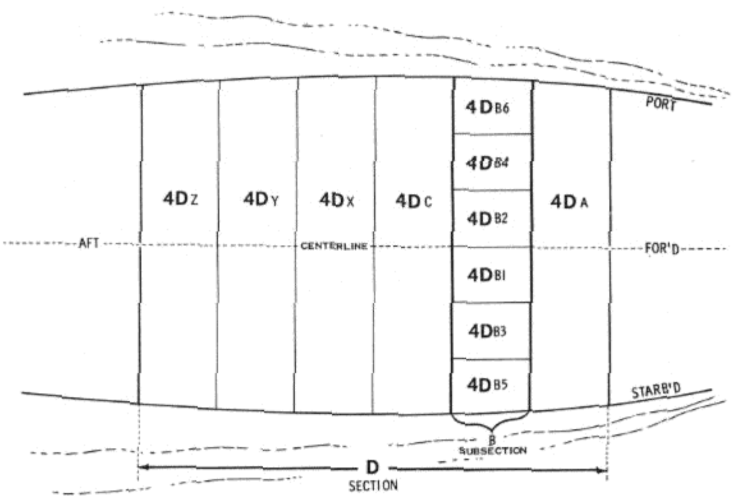


Figure 10-23 Topview of Section 4DB

This is the basis of the system. It may seem complicated at first glance, but further study will show how ridiculously easy it really is. Once you have this system firmly in your mind, you will be ready to learn and understand the more complicated exceptions to the rules which you will encounter in a ship. If you do not take the trouble to learn this system well, you will be hopelessly lost in a ship, and a menace to all your shipmates.

An easy way to remember the system is to form the following picture in your mind:

DECK from the weather deck	SECTION from forward	SUBSECTION from fore or aft	SUBSECTION from the centre

Doors and hatches are marked with the compartment into which they open or give access. Thus the door to compartment 4DB4 would appear as in Figure 10-24.

Doors in the main watertight bulkheads are marked with both the sections which the bulkhead separates. Thus the door on number "4" deck between section "D" and "E" would be marked "4 D/E".

So far in this chapter you have found the very basic principles of A B C D organization. If you learn these principles well, you will find that the more complicated practices of damage control in a ship will come easily. Ask yourself these questions:

Can I explain how a ship floats?

Do I know how and why watertight discipline is enforced?

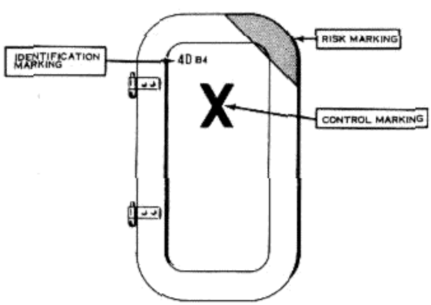


Figure 10-24

When I go to any part of a ship can I report accurately where I am?

If the answer to all these questions is yes, you are ready to learn how damage control is put into practice. If the answer is no, then you must study this chapter or, better than that, get an experienced man to explain these principles to you.

ATOMIC WARFARE

The devastating effect of atomic explosion is common knowledge nowadays. Thus far, atomic bombs have been used in anger only on land, but that does not mean they will not be used against ships. Far from it. Therefore, modern warships must have some protection against the effects of atomic explosion.

The atomic bomb used in the war against Japan had the power of 20,000 tons of TNT. Since that time *thermo-nuclear* bombs have been designed with a power of well over 10,000,000 tons of TNT! A few ounces of TNT can easily kill a man.

The theory behind the atomic explosion is far too complicated to detail in this book. Very simply it involves splitting an atom in order to convert a certain amount of mass into energy. Mass is actual material with weight. Energy may be heat, lip,ht ora force causing things to move. All matter (for example, the paper in this book) is composed of tiny particles called atoms. The splitting of an atom is called *fission*, and any material whose atoms may be split is called *fissionable material*. The end products, of the fission process, or explosion are called *fission products*. Remember these names.

The atomic explosion differs from that of, say TNT, in a number of ways. In the first place, the actual blast or shock wave takes a much longer time. Secondly, the temperature is about 200 times hotter than that of a TNT explosion. In fact, the centre of the bomb approaches the heat of the sun itself. Lastly, powerful *radiations* similar to X-ray, are given off which can cause great harm to the body if they penetrate in sufficient quantity. If the explosion touches

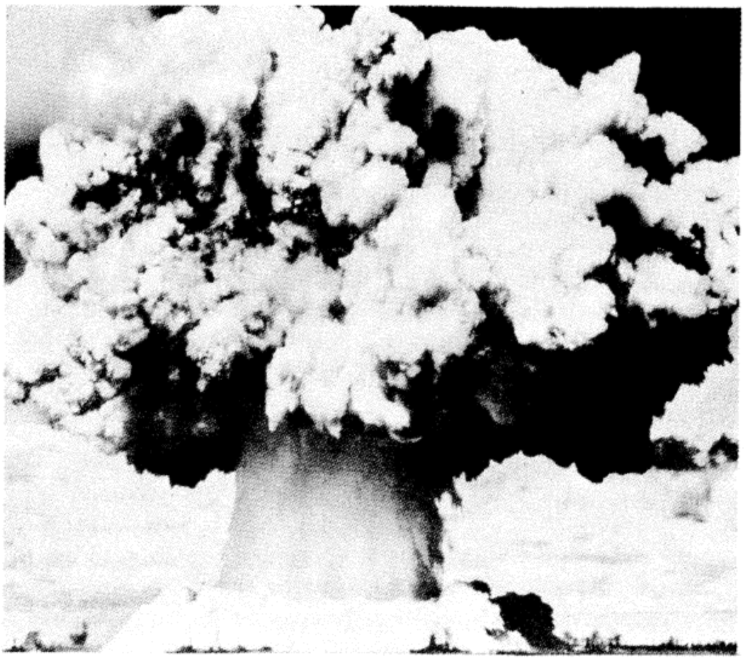


Figure 10-25 Underwater Atomic Explosion

the ground or sea the radioactive fission products mixed with dirt and debris fall back to earth. This *contamination*, as it is called, continues to give off harmful *radiation*.

A bomb burst in the sea gives off a shock wave through the water which will damage the hulls of ships within a certain range. In addition to this a cloud is formed. This cloud is very similar to the usual type except that the water particles in it are radioactive. It moves outward from the explosion and drops radioactive water on everything it passes on or over.

Besides the usual damage control measures, there is little we can do to protect ourselves from any other of the explosion effects except for this radioactive cloud. In fact, the best protection from atomic attack is to have a good deal of distance between one's ship and the explosion. Of course, this is not always possible.

CHEMICAL WARFARE

The use of gas in warfare is no new thing. Many hundreds of years ago sulphur used to be burned upwind so that the fumes would choke the enemy. The first really effective use of gas on a large scale was in the Great War (1914-1918) when the Germans released chlorine gas to be carried by the wind into allied troop positions. It is considered by many that, had the Germans concentrated on the use of gas, they might well have won the war and thus changed the whole course of history!

German gas in this war caused a great many causalities, but since then scientists have been at work. Modern gases are at least *ten times as deadly*, and they do not rely upon the wind to spread them! In any future war, our enemies must be expected to be completely ruthless. If it seems advantageous for them to use war gas, no doubt they will do so without any second thoughts. Chemical warfare is a very real threat.

But first, what is a war gas? "Any substance which may be used by an enemy to reduce the fighting efficiency of a man by its poisonous, irritant, or blistering effect is called a *chemical warfare agent*.

The most common agent used in peacetime is *tear gas*. It is not normally lethal, but causes extreme discomfort to the eyes. It is used mainly for testing the efficiency of gas protection measures or in the control of riots.

The agents you may expect to encounter in wartime are *blister* and *nerve gases*. Blister gases cause irritation and blisters on any surface of the body they touch, *inside or out*. Nerve gases actually attack and paralyze the various nerve centres of the body causing convulsions followed by death.

Chemical warfare agents may be delivered in a number of ways, the most probable of which is in the form of a liquid contained in a bomb, shell, or rocket, or sprayed from an aircraft. It is easy enough to see, then, that it no longer depends upon the wind to spread it.

To protect against chemical warfare agents it is first necessary to detect them. This is not easy, because some of them, like nerve gas, are invisible and odourless. It has been found that the most efficient detection device is the human body itself. For that reason, the experts have devised a rule which, if learned and followed, will give you the best chance of surviving a chemical attack.

The Chemical Warfare Safety Rule:

If for no obvious reason you have dimming of vision and difficulty in focusing on close objects, irritation of the eyes or a sudden headache, tightness of the chest, running nose and excessive saliva, or if you notice a suspicious smell or a suspicious liquid, or if there is a hostile bombardment or hostile smoke, then the presence of a chemical warfare agent must be assumed until proven otherwise. Put on your respirator!

There are other ways of detecting chemical warfare agents, but none is nearly as quick or nearly as accurate as the human body. Learn the safety rule and obey it.

Atomic and Chemical Protection

In most ways, the measures taken for atomic and chemical protection are the same. While atomic protection must deal with a cloud of radioactive vapor, chemical protection must deal with a cloud of chemical warfare agent. The main protection is common sense: the simple matter of “getting in out of the rain”.

Just as a ship is made watertight to keep the water out, it is made as airtight as possible to keep the gas or radioactive vapour out. The part of the ship which is made completely airtight or gastight as it is called, is, known as the *citadel*.

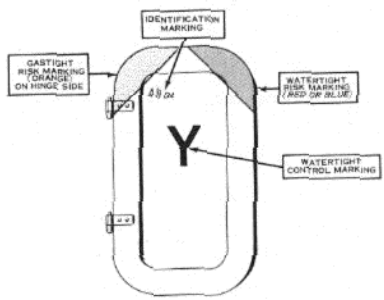


Figure 10-26 Gastight Risk Marking

Doors and hatches must have some marking to show how dangerous it would be to leave them open if a ship were passing through a contaminated cloud so, just as watertight openings have a red or blue risk marking, openings to the citadel have orange risk markings. This marking is on the upper part of the door opposite the watertight risk marking.

Again, just as watertight discipline has its control markings which are “X”, “Y”, and “Z”, gastight discipline has its control markings which are “A”, “B”, “C” and “M”. These are marked in orange with a circle about them.

Now, where a ship is watertight, it follows that it is also gastight, so where there is an “X”, “Y”, or “Z”, there is

Figure 10-27 Orange Control Markings

no necessity to have an “A”, “B”, “C” or “M”. These latter markings are put on doors, hatches, and ventilation openings which have no watertight risk, but which do have a gastight risk. They are to help in the task of closing down a ship. *Closing down* means to make a ship as gastight as possible.

Openings marked “C” are closed down first. These are openings which, by being shut, do not bring too much discomfort to the ship’s company. It will be about 60% of the openings in the ship. “C” is for *caution*!

Openings marked “B” are closed down second. These are openings, which provide air for those spaces which are cleared of men when the ship’s company goes to action stations. “B” openings are closed down when an attack is likely. “B” is for *beware*!

Openings marked “A” are closed down last. These are openings which, closed, give actual discomfort to the ship’s company at action stations, so they are always left until the last moment. The list of “A” openings is kept as short as possible so that they may be closed down quickly. “A” openings are shut when the ship is actually approaching a contaminated cloud. “A” is for *alarm*!

There are some openings which just cannot be closed down if the ship is to operate. For example, the fires in the boiler room need air, so if a ship’s engines are running, you cannot shut off the air supply to the boiler room. The rule for these openings is that they are to be shut down only when it is possible to do so; they are marked with an “M”.

Just as there are various states of readiness in damage control depending on the circumstances, there are various states of readiness in ABC protection.

State of readiness	Circumstances in which assumed	What happens
A	An ABC attack is bound to happen any moment.	The ship is completely shut down.
B	Conditions are suitable, and it will be no surprise if an ABC attack occours.	"A" openings are probably left open, but you should be able to come to state "A" in less than 5 minutes.
C	An ABC attack may be on the way, but you are not sure.	This is a relaxation of state "B." To allow for ease of living and working a few more openings may be left open.

There are times when an ABC attack may occur too quickly to allow you to take cover, or you may be required to work in an exposed position during an attack. In this case some sort of individual protection is needed.

Figure 10-28

PERSONAL PROTECTION

Protective Masks

Every person in a seagoing ship is issued with a protective mask or respirator. Provided it is treated properly, it will give full protection to the face, eyes, breathing passages and lungs against any known type of chemical warfare agent or radioactive vapour.

The proper way to don a protective mask is to put the thumbs under the bottom straps, the chin in the mask, and pull it back over the face. When you have it on, blow out hard to get rid of any vapour you may have trapped inside.

If it is necessary to get rid of any liquid such as perspiration, vomit, etc., merely lean forward and blow out hard.

To remove the protective mask, merely place two fingers under the flat part under the chin and pull upward. (Figure 10-30).

To stow, replace the plugs, wipe out the facepiece, hold it like this. (Figure 10-31). Fold point 'A' over and hold it with your thumb while you stow it in the haversack with the speech device to the front, the eyepiece to the left, and the canister to the right.

There are a few rules about the care of protective masks which should be remembered:

1. Keep water out of the canister.
2. Keep the plugs in place when not in use.
3. Do not allow the canister to be dented.
4. Keep away from heat.
5. Do not hang by the head harness.
6. Make sure the canister is screwed on tightly.
7. Do not stow unauthorized articles in the haversack.

If you do not obey the above rules, you probably will not live to complain about your protective mask not functioning.

Protective Clothing

The most common types of chemical warfare agents penetrate ordinary clothing quite easily. You should wear an oilskin

Figure 10–29 Donning the Mask

Figure 10–30 Removing the Mask

Figure 10–31 Stowing the Mask

and seaboots for added protection. If you are forced to work in a badly contaminated area, special protective clothing will be issued.

Radiation from badly contaminated parts of the ship will penetrate any sort of clothing as if it did not exist. The only protection against danger of this sort is for these badly contaminated areas to be found and isolated until the contamination wears off or is reduced by decontamination methods.

Decontamination

The arrangements for decontaminating the ship itself are complicated and are set down in other manuals. However, the most common method is that of washing down. The radioactive particles from a cloud or the liquid particles of a chemical warfare agent settle like moisture on a windowpane. Automatic sprinkling systems, not unlike those used for watering lawns, are turned on from inside the citadel to wash away most of these dangerous particles.

BIOLOGICAL WARFARE

Biological warfare is defined as the intentional use of living organisms or their poisonous products to produce disease, disability, or death in man, his food crops, or his animals. More commonly this is called germ warfare.

The disease may be delivered in a number of different ways: by shell or missile; by saboteur, or by a natural carrier such as a tat or an insect. It may be put in the drinking water of food supply, carried in the atmosphere, or, possibly sprayed on crops by an aircraft.

The most effective war disease is one which spreads quickly and is difficult to immunize humans against.

The great difficulty in protection against biological warfare is the fact that it is difficult to detect the presence of the disease before it has done a great deal of harm. After the first case of a disease has been reported, a laboratory may require from 24 to 48 hours to determine the type of disease and the most effective action against it.

Disease is no new thing in the Navy. Not many years ago, great numbers of people used to die regularly from one disease or another on every passage. Over the years, it has been found that the best protections against disease are cleanliness and healthiness.

Disease germs live on filth. In a dirty environment, on a dirty body, disease germs thrive and multiply rapidly. In clean conditions they have difficulty even living. Because you can never tell just when or how a biological attack is delivered, it is necessary to be clean all the time. To be absolutely certain you should keep your ship and your body in a perfect state of cleanliness.

If you are dirty, and if you live in a dirty ship, you can confidently expect to be killed by the mildest of biological attacks, and you can expect that your death will be a hideous and a painful one. Even if you are not attacked, under these conditions it is likely that disease will come of its own accord.

However, if you suspect that a biological attack is going on, the best immediate protections are the respirator and protective clothing. You should not smoke, and you should eat and drink only tested and approved foods. At the first symptoms of illness you should seek medical aid.

FIREFIGHTING

Fire may break out at any time in any part of a ship. It may be the result of enemy action, the result of carelessness, or a pure accident. But no matter what the time, place, or cause of fire, it will do some damage until it is controlled or extinguished.

Firefighting is not confined to the experts. Every man in a ship, regardless of trade, may be called upon to fight fire; in fact the safety of the ship may depend upon your quick and correct action should you discover a fire. Nor is there time to go and look the matter up in a book. Every man must know how to take firefighting action instantly.

First of all, then, what is a fire?

Scientists tell you that it is a chemical reaction of combustible vapours or gases mixed with oxygen and raised to ignition temperature. Naturally, this is not the first thing you think of when you burn your finger on a cigarette! More simply, fire is the uniting of the vapours given off by any substance with the oxygen of the air. Every burnable substance gives off vapours. In the case of wood or paper, it has to be heated before the vapour is given off.

There are two different temperatures needed to start a fire. The first is a temperature high enough to make the fuel give off vapours; the second is a temperature high enough to make these vapours unite with the oxygen of the air. The first temperature is called the flash point. It is different for every substance. For example, the flash point for gasoline is 45° below zero, while that for fuel oil is 150° above zero.

The second of these temperatures is called the ignition temperature. If a substance has reached its flash point, and a spark with a temperature of or above the ignition temperature passes neat it .... poof! you have a flame. The ignition temperature for gasoline is 495°, while that for fuel oil is 750°. These may seem like high temperatures until you realize that the end of a cigarette burns at between 800° and 1200°. Even a spark from the heel of your boot is over 495°. Now do you understand why gasoline is a dangerous substance?

You have seen, then, that there are three things needed for a fire: a fuel that will vaporize; heat to make the fuel vaporize and ignite; and oxygen for the vapour to ignite with. Remember these essentials by visualizing the triangle shown in Figure 10-32.

If you take away any of the sides of this triangle, you cannot have fire. Thus we have found the way of putting fires out. Take away the oxygen, or smother the fire, take away the heat by lowering the temperature; or remove the fuel.

Different fires must be put out by different methods. You do not put out your cigarette by taking a fire hose to it, nor

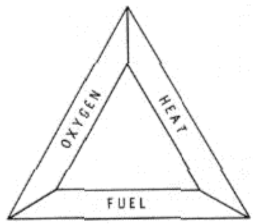


Figure 10-32

do you put out a pool of flaming gasoline by putting your foot on it! You do put out a cigarette by smothering it underfoot, and you do put out a pool of burning gasoline by smothering it with chemical foam.

Classification

To make it easier to know which is the right way to put out any destructive fire, we divide fires into classes according to to what is burning or what started it.

Class "A" fires, the most common type, occur when such things as wood, paper, clothing, etc. burn. Your cigarette end is a class "A" fire.

Class "B" fires are those when oils, paints, greases, etc., burn. Your cigarette lighter makes a class "B" fire.

Class "C" fires are electrical fires. Your electric razor makes a class "C" fire if it becomes overheated.

It has been found that the most effective way to put out a class "A" fire is by reducing the temperature and thus removing heat. This is done by drenching with water.

If you put water on burning oil, the oil would float to the surface, spread and carry on burning. So you smother a class "B" fire with chemical foam, carbon dioxide, or steam. It is also possible to reduce the temperature with cooling fog.

If you spray water on an electrical fire you are liable to get a shock. So you smother electrical fires with carbon dioxide a gas which, being heavier than air, will blanket the fire and keep the air away. But remember, turn off the electricity first if you can.

The following table may make it easier to remember:

FIRES

Class	Methods	With What?
A (Ordinary)	Take away heat	Water
B (Oil)	Smother	Foam, carbon dioxide, steam, (cooling fog)
C (Electric)	Smother	Carbon dioxide (shut off current)

The Beginnings

Unless an explosion has taken place, all fires start from ridiculously small beginnings. Caught in this stage they can be put out very easily, but if they are not caught, they will bring more and more material to the flash point, and finally become a large fire. Millions of acres of forest are burned every year by fires which begin from carelessly discarded cigarette butts.

In the Navy there is equipment to deal with all sizes of fire. For the small fires there are hand extinguishers. For the large fires there are fire hoses with different types of nozzles. And for large fires in out-of-the-way places, there is built-in equipment such as sprinklers and flooding arrangements.

Hand Extinguishers

The *Gas Water extinguisher* gives a spray or jet of water from 1 to 5 minutes. It is operated by removing the small metal cap and striking down on the knob or button. This extinguisher is used on small class “A” fires.

The *Chemical Foam extinguisher* produces about 20 gallons of foam in a stream which lasts about I minute. It is operated by merely turning it upside down and shaking it. The foam should be directed against a vertical surface so that it can slide down onto the fire. This is used for class “B” fires.

Figure 10-33 GasWater Extinguisher

The *$C0_2$ extinguisher* gives off carbon dioxide for about 1 minute. Carbon dioxide is heavier than air, so it settles over the fire and smothers it. This extinguisher is operated by pulling out the safety pin and squeezing the handle. It is used for classes “B” and “C” fires.

Fire Hoses and Fittings

Fire hoses are stowed near hydrants all over the ship. They are in 50 foot lengths, and the hydrants are so placed that no part of the ship is more than 50 feet from one.

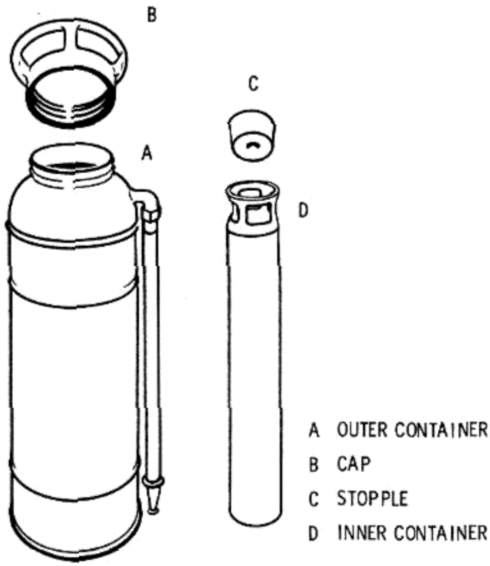


Figure 10-34 Chemical Foam Extinguisher

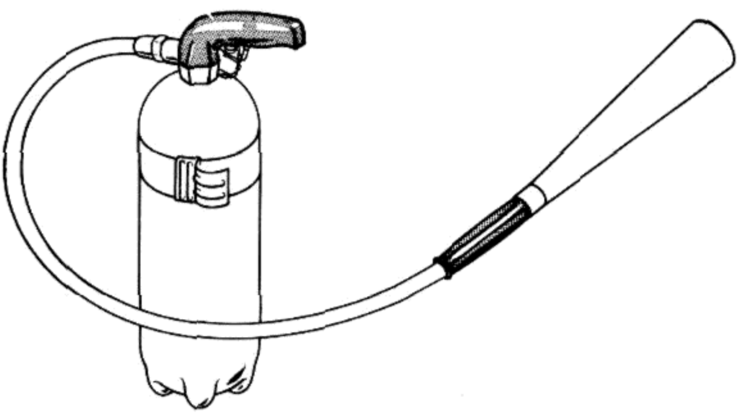


Figure 10-35 C02 Extinguisher

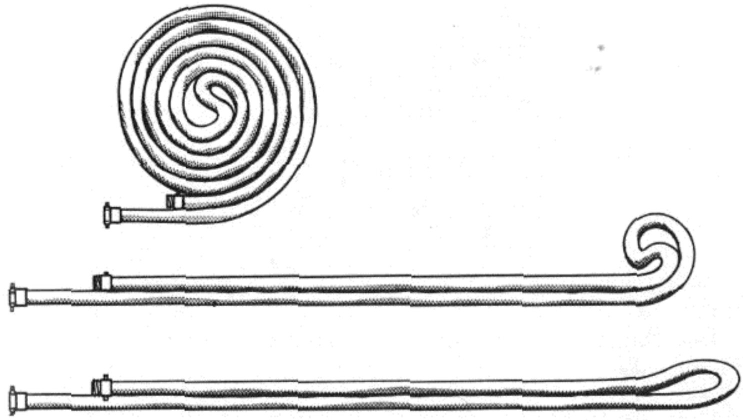


Figure 10-36 Doughnut Roll

The usual fire hose carried in a ship is 1½ inches in diameter. It is made of cotton with a rubber inner lining, and if well cared for it should fast for 10 years.

There are two ways of stowing fire hose. One method is the doughnut roll. (Figure 10-36). Many hoses are flaked on a stowage rack. (Figure 10-37).

The nozzle fitted is called the “Rockwood” or “all-purpose” nozzle. It may be made to produce either a jet or a fog by moving the valve lever. (Figure 10-38). Long nozzles called applicators, producing fog only, may be fitted into the Rockwood nozzle. These are issued in 4 or 10 foot lengths.

For use on large class “B” fires a mechanical foam nozzle may be fitted. This is a special nozzle which connects to a 5 gallon container of chemical foam compound and will produce a very large quantity of foam.

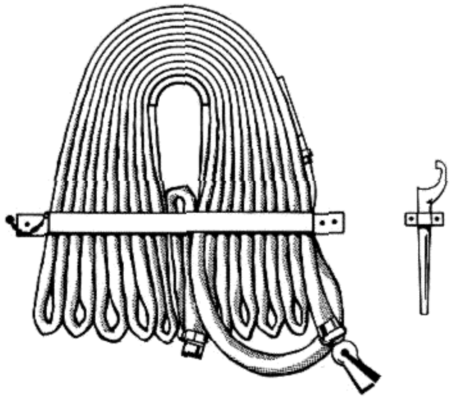


Figure 10-37 Stowage on a Rack

If a fire is large enough to warrant using a hose, you want to be sure that the hose works. It may be very painful for you if the hose is full of leaks, and only a little trickle comes out

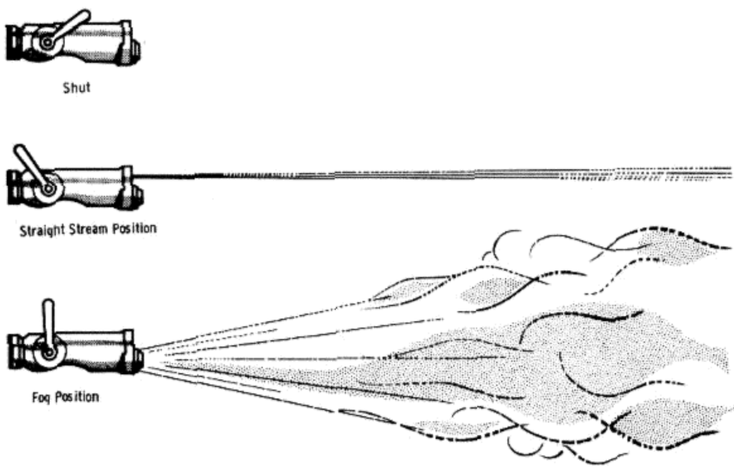


Figure 10-38 Rockwood Nozzle

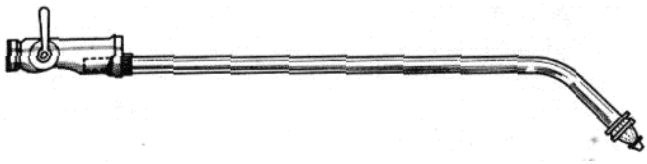


Figure 10-39 Rockwood Nozzle with Applicator

the nozzle. Tears and snags from dragging the hose over rough surfaces during exercises account for a good deal of hose damage. If it is at all possible, always lift a hose rather than drag it. Another cause of damage is improper drying. If you stow a wet hose, the cotton is liable to rot. Make sure a hose is dry before it is stowed. Oils and gasoline may damage the rubber lining of a hose if they are allowed to seep through the cotton fabric. If you get an oily substance

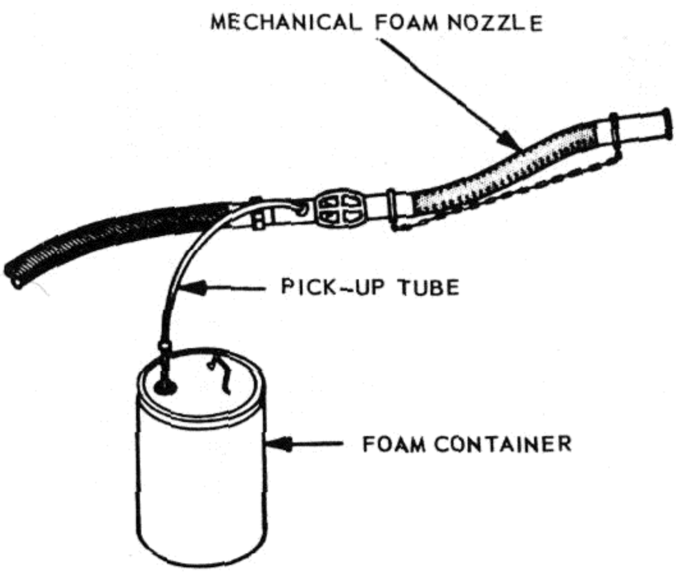


Figure 10-40 Mechanical Foam Fitting

on the hose, see that it is washed with plain water and soap, rinsed, and thoroughly dried before stowing'.

Naturally, the greatest wear and tear on a hose comes during a fire. Avoid getting overexcited and abusing the fire hose...it may be your lifesaver.

Permanent Fittings

The hydrants to which fire hoses are attached are themselves a part of the fire main. The fire main is a pipe which runs the length of the ship or in the form of a loop around the perimeter of the ship, and in it is kept a constant pressure of sea water. Hydrants are led off the fire main at all deck levels. It is marked with a 2 inch wide red band, the words "FIRE MAIN" in block letters, and an arrow showing the direction of flow.

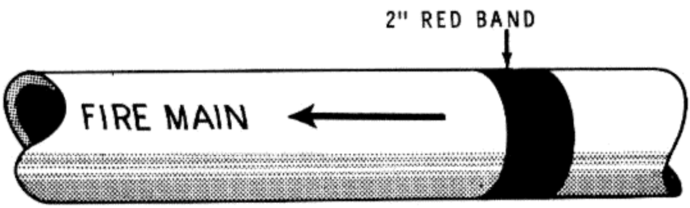


Figure 10-41 Fire Main Marking

Also coming off the fire main are sprinkling systems for magazines and other compartments containing explosive or inflammable material. The beauty of the sprinkling system is that it wets the whole compartment at once. Should the fire be a bad one, it is normally possible to flood such compartments by opening a direct valve to the sea, but the sprinkler is always the first measure because it is faster. It takes about five minutes to flood a magazine, by which time, if the fire is near the top, you would be blown up if you relied solely on flooding.

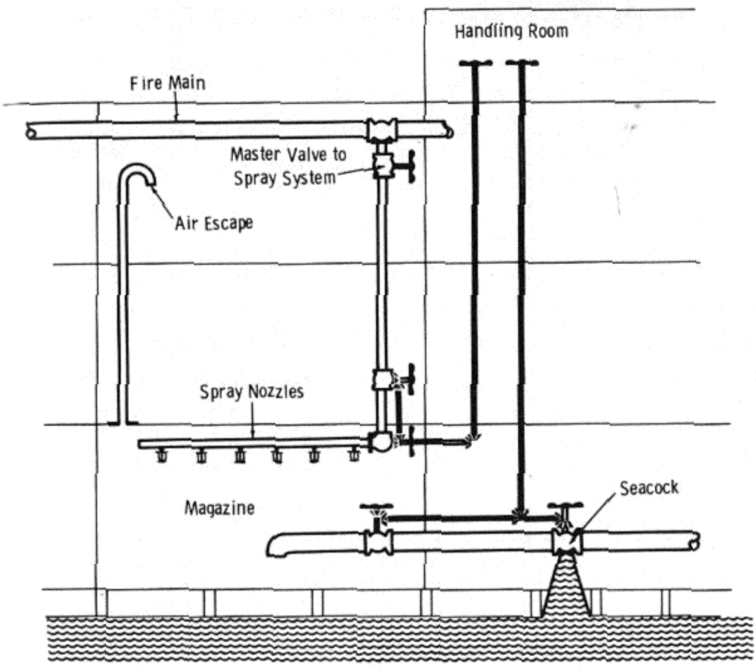


Figure 10-42 Diagrammatic arrangement of Typical Magazine Flooding and Spraying System

Another fitting in ships is the foam inlet tube. These are normally fitted into the bottom of machinery spaces from the main deck so that foam may be poured into the inaccessible places where oil fuel is liable to gather.

Fighting the Fire

In every ship there is an organized fire party maintained 24 hours a day at sea or in harbour. This party consists of men of all trades, including key personnel who are qualified

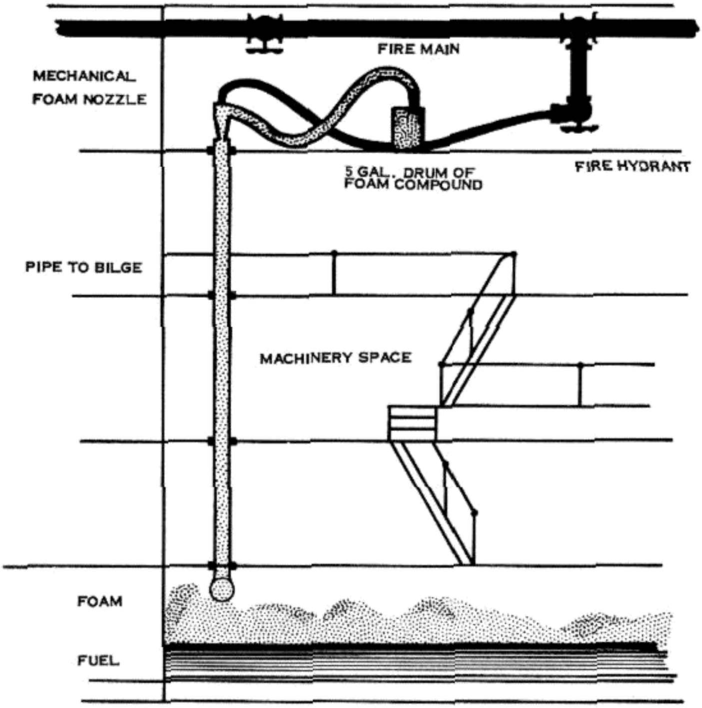


Figure 10-43 Foam Inlet Tube

to run pumps, operate sprinkling and flooding gear, and other technical jobs. The fire party is exercised frequently, and at each muster its members are detailed for their jobs should a fire break out.

The actual business of firefighting depends a lot on the nature of the fire and its whereabouts, but there is a standardized procedure for dealing with any fire you may happen upon.

Anybody discovering a fire should attack it immediately with the proper extinguisher. (Remember your table of classes). At the same time he should shout *"FIRE!"* at the top of his lungs until he has attracted some attention. He should send the first person who arrives on the scene to inform the Officer of the Watch or Officer of the Day in the quickest way possible. The fire party will then be piped to the scene.

Here again is one of the times when it is essential to know your ship. If you should happen to hear one of your shipmates shouting, *"FIRE"* you would feel very foolish if you were not able to, report its exact whereabouts to the Officer of the Watch.

When the fire party arrives on the scene and the firefighting commences in earnest, discipline is the most important thing. The officer or petty officer in charge must be obeyed instantly, and he must be informed of everything that happens so that he may give the most effective orders. Above all, if you are not actually detailed for a job, keep clear of the fire area until you are needed. join up with the reserve party, but do not try to help in any way unless you are ordered to do so.

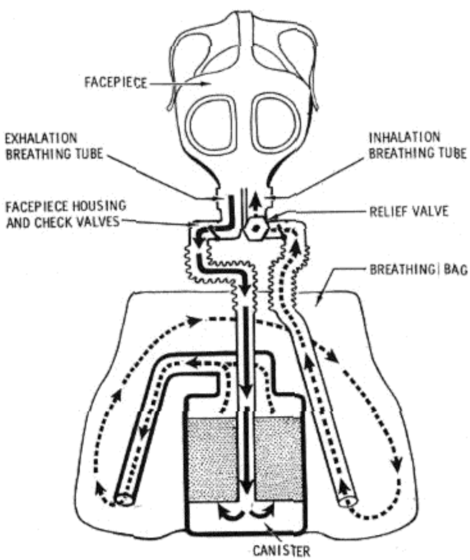


Figure 10-44 Oxygen Breathing Apparatus

Shipboard fires are generally accompanied by a great deal of smoke. To surmount this difficulty, *oxygen breathing apparatus is* supplied.

Included in this set are means of supplying, cooling, and storing oxygen, and the means of purifying exhaled air. With the breathing apparatus you do not use any of the smoke filled air. The air that is used and reused is the air which you breathe into the set to begin with. It is therefore necessary that it be put on when you are in pure atmosphere. Learn how. to use this set, it may be a lifesaver.

Fire Prevention

It is a startling fact that 90% of all destructive fires might have been prevented. Fire prevention is the best firefighting method because by practicing it, you generally remove the fuel and heat sides of the fire triangle, and make fire impossible.

Smoking

Do not smoke in restricted areas. Take care when you dispose of your cigarette butts in smoking areas. Do not throw cigarette butts over the side.

Electrical Apparatus

Do not use any but authorized electrical apparatus. Do not use electric irons without proper insulating stands. Do not throw clothing, towels, deck rags, etc. over electric heaters. Do not drape anything over electric motors, it will cause overheating. Do see that electrical equipment is always clean and well maintained. DO NOT let anything come in contact with naked light bulbs. Do not build yourself any makeshift electrical devices.

Steam Pipes

Do not leave inflammable materials in contact with steam pipes. Do not hang clothing to dry over steam pipes.

Spontaneous Ignition

The vapours of some substances unite with oxygen fairly quickly and without there actually being a fire. As this happens, heat is produced. The more heat that is produced, the more vapor is produced. The more vapour, the more heat, and so on until the flash point is passed, and finally the ignition temperature is reached, then, all of a sudden, the substance bursts into flames all by itself. This is called spontaneous ignition. The most common substances which cause spontaneous ignition in a ship are oily or paint soaked rags, waste, or clothing.

Do not leave oily or paint soaked rags, waste or clothing about in heaps. Sailors are like pack rats, once they see one bit of oily waste on the deck they put another, and another, and another until there is a little heap. If you must stow that paint rag, put it in a metal container and shut down the lid.

Fire prevention is like keeping little boys out of trouble there are a great many "Dont's". There is, however, one big "DO": DO use your common sense it is 90% of fire prevention.

QUIZ

1. What is A B C D? What is damage control?

2. How much water is displaced by a floating object?

3. What is righting moment?

4. Explain damage control risk and control markings.

S. What are the damage control states of readiness?

6. Why should you know your ship?

7. What do you understand by compartment 4DB4?

8. Why is atomic protection similar to chemical protection?

9. What is contamination?

10. Explain the term “gastight discipline”. What are the A B C states of readiness?
11. What is protective clothing?
12. What is the primary rule in biological protection?
13. What are the various classes of fire, and how are they put out?
14. What are the types of fire extinguishers and how are they used?

The answers to these questions may be found in Chapter10. When you can answer all of these questions perfectly, you may consider yourself to have a fair grasp of this chapter.

CHAPTER 11

THE ORGANIZATION OF A SHIP

There is no room for passengers in a warship. Everyone on board must have a job to do and the times and places of jobs must be so arranged that they do not overlap. If one pair of hands or one brain in a ship is idle when it shouldn't be, that ship is running many times less efficiently than it should.

By tradition and by necessity, sailors are jacks of all trades but in this day and age of complicated equipment and crowded ships, it has also become necessary for a sailor to become master of at least one trade. Thus, a ship is organized in such a way that the men of each trade work together to form a team. That is, the work of the men of one trade complements or adds to that of all the other trades and so on until everyone is working efficiently and all the jobs are being done. It is necessary then, to allocate certain particular jobs to men of certain trades.

You will hear branches spoken of in the service. This is wrong. Since a ship's company must work together, it obviously cannot be split up into branches. In a school, all the men and women who teach are teachers, whether their specialty be history, arithmetic or science. In the same way, all the men

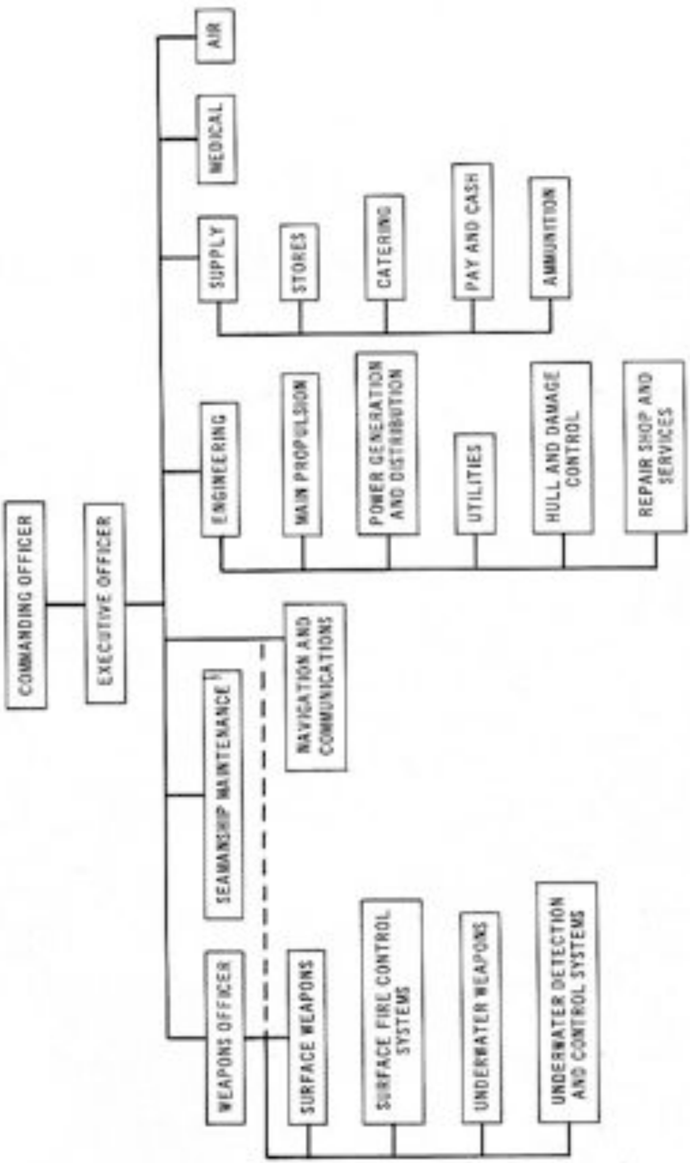


Figure 11–1 Organization of a St. Laurent Type Escort Destroyer

in a ship are seamen, whether their specialist knowledge has to do with the engine room, the galley or the main switch board. One of the worst things that can happen to a ship is for jealousies or bickering to arise between the men of one trade and those of another. Every man in a ship's company is indispensable otherwise the captain would soon remove him.

The organization of a St. Laurent Class DE is shown in figure 11-1.

First of all, in the organization of any ship, there is the Commanding Officer or Captain. He is responsible for everything that happens in the ship, and everyone else in the ship is responsible directly or indirectly to him that their jobs are done property.

The Executive Officer or First Lieutenant, is second in command of the ship. He is responsible directly to the Commanding Officer for the ship's organization, its cleanliness and its discipline. Should anything happen that the Captain could no longer command his ship, the Executive Officer would assume command.

Below the Executive Officer, the ship is divided into departments. Each department is given a group of related jobs as its particular responsibility in the ship and each department is manned by a group of men of the appropriate trades to do those jobs. At the head of each department is an officer or chief petty officer who is responsible to the Executive Officer for the organization of his department.

The largest of these departments is the Engineering Department. In normal peacetime running in a St. Laurent

class ship, this department will have about 70 men out of a total complement of about 190. The engineering department is responsible for the main engines, the electrical system, auxiliary machinery and running the damage control organization. This department is headed by an officer who has had specialist engineering training. Assisting him there is a more junior officer and various chief petty officers who are experts in their trades. There will be a chief engineering technician to look after the boilers, main engines and their auxiliaries; a chief electrical technician to look after the generation and distribution of electricity, a chief hull technician to attend to the hull and its fittings, and to operate the damage control organization.

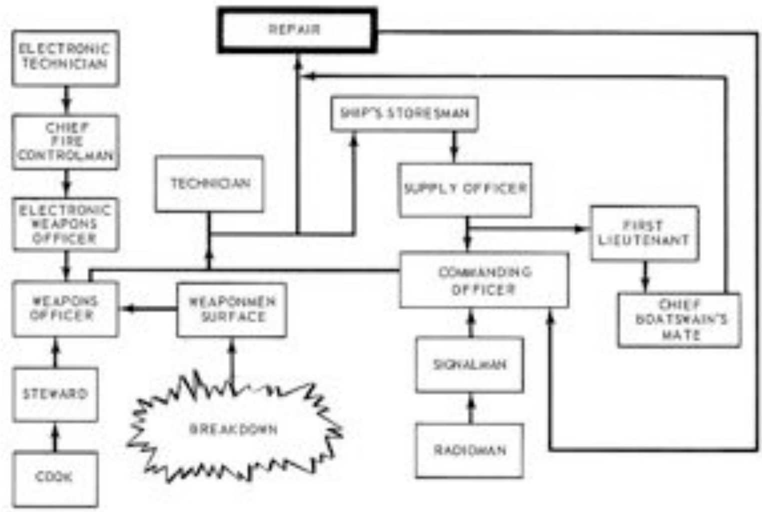
The next department to consider is the Upper Deck Department. This is headed by the Chief Boatswain who is responsible directly to the Executive Officer for the maintenance and cleanliness of the upper deck and all its fittings, including boats. There will be about 23 boatswains at various trade group levels to do these jobs.

The Weapons Department is headed by an officer who is assisted by a more junior officer. The weapons officer will have specialist training in the use and maintenance of all weapons. This department maintains and operates the weapons and their associated detection devices. Once again, this department is split up into various groups headed by chief petty officers. A chief weaponman surface looks after the surface weapons; and a chief weaponman underwater and chief sonarman look after underwater weapons and submarine detection devices respectively; a chief firecontrolman looks after the complex control systems for all of the weapons. The electronic technician is also a member of this group. He is the expert on maintenance and repair of all electronic equipment. In all, there are about 34 men in this department.

Another department is the Navigation and Communications Department which is headed by a lieutenant. Besides strictly navigational and communications jobs, this department operates the ship’s radar and provides the operations room team. There are about 37 men in this department and may include a chief radioman, a chief signalman and a chief radar plotter, who will be assisted by electronic technicians and other experts when necessary.

Last, but not least, there is the Supply Department headed by a lieutenant. This department is 25 men strong. It has a chief storesman to ensure that the correct stores are always available on board; a chief commissaryman to look after the preparing and serving of food; a chief writer to look after pay and paper work and a weaponman for the safe custody and supply of all sorts of ammunition.

In addition to these major departments, one medical assistant is carried to maintain the sick bay, treat minor ailments and advise the Captain on medical matters.



NOTE HOW THE WEAPONS OFFICER FOLLOWS THE REPAIR THROUGH ASSISTED BY EVERY OTHER DEPARTMENT IN THE SHIP; AND HOW THE COMMANDING OFFICER IS INFORMED AT EVERY STAGE.

Figure 11–2

Let us see now how this departmental organization works. Suppose you are steaming along one day about lunchtime and the weaponmen surface, who are exercising the forward gun, find that their control system has broken down. First of all, a man is sent to inform the Weapons Officer. The Weapons Officer has been having an early lunch, so he gives his plate to the steward to keep warm. He then phones the Boatswain on the bridge and instructs him to make a pipe for the Chief Firecontrolman. The unserviceable part of the equipment is taken to the electronic workshop where there are repair facilities. Meanwhile, the Captain has been informed and he sends for a signalman to make a message to the accompanying ships saying that the gunnery exercise planned for that day must be postponed until repairs are completed.

Eventually the team doing the repairs discovers that the trouble is being caused by a faulty motor. Consultation with the Chief Storesman reveals that he has none of these motors on board as spares because he has had to provide them for previous repairs on that passage. The Supply Officer then asks the Captain if they might draw a motor from one of the ships in company. Another message is made and the motor is passed from ship to ship by means of a jackstay which has been rigged by the Chief Boatswain's Mate and his team. With the new motor, the repair is quickly done and the gunnery exercise is carried out as scheduled.

Thus, to repair a firecontrol system, men have been required from every department in the ship. If these men have worked as a team, the repair will be quickly done. This is how the department system works.

WATCHKEEPING

Another requirement in ship organization is arranging the times when people are working so that the maximum efficiency may be obtained. It is obvious that while a ship is at sea there must be men awake and working around the clock. Similarly, in harbour, some men must be awake to keep auxiliary machinery running and to cope with any emergency which may arise. Again, during the day at sea or in harbour, there is cleaning to be done and machinery to maintain, so that in addition to the men actually running the ship, there must be others carrying on the routine chores.

This is worked out very easily. You will recall that the

the day is divided into watches. The ship's company is divided into groups of sufficient size to keep these watches— that is, run the ship during the period of the watch. Each of these groups of men is actually called a watch.

The *watch on deck* in a ship at sea is a group of men of specialist seaman trade, together with any men available from other trades. They do such jobs as helmsman, telegraphman, seaboat's crew and lookouts. In addition to the watch on deck there is a watch in the engine room to keep the ship running. Radar plotters keep a watch on the radar sets and radiomen on their equipment. If the Captain wishes to use sonar, a watch is kept on those sets and so on throughout the trades.

Certain men, like cooks and stewards, do not keep a watch in the normal sense. Their work is done at about the same time every day and during the rest of the day there is no need for most of them to be on watch. These men, who include most of the supply trades, are called daymen.

Watch Systems

There are two systems of dividing a ship's company into watches the two watch and the three watch systems. In the two watch system, the watches are called the port and starboard watches. Each watch is further split into two parts. Thus you have the first and second parts of the port watch and the first and second parts of the starboard watch. Normally only one part of a watch is "on deck" or actually keeping a watch at any given time.

Really, then, this is a four watch system. In the three watch system, there are the red, white and blue watches and one complete watch is on duty at any one time.

In a St. Laurent Class ship, the two watch system may be used when the ship is cruising in peacetime and a three watch system may be used for exercises. There is no hard and fast rule about which system is to be used. Each has its advantages and disadvantages. In the two watch system, it is possible to close up the fewest number of people necessary

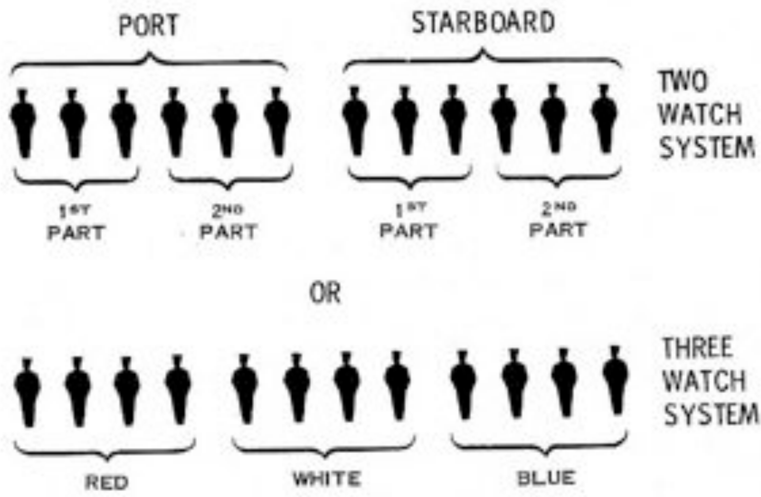


Figure 11–3

to run the ship safely. Yet in some circumstances more people are needed than one part of a watch provides. In this case, it is necessary either to be in three watches or to close up the whole of the port or starboard watch. The engineering department nearly always uses the three watch system and it is quite common for a ship to have different watch systems running in different departments. It all depends on what job is to be done and how many hands it requires.

A watch from either system is normally made up of one petty officer, one or more leading seamen and as many working hands as are available and necessary.

In a ship at sea, normal daytime working hours are laid down. Men who are not on watch turn to with their own departments to do the routine chores and maintenance, or the normal housekeeping duties of the ship.

PARTS OF SHIP

In addition to being divided into watches, a ship's company or parts of it is divided into parts of ship. The three parts of ship are forecastle, top and quarterdeck.

Figure 11–4

Certain exercises or evolutions and certain operations such as entering and leaving harbour require the maximum number of hands available on the upper deck. At these times hands muster by parts of ship. For example, a weaponman surface, whose special duty may be maintaining and operating a gun mounting, may muster on the quarterdeck part of ship for entering harbour or just as a working hand when he is not employed in his trade. A petty officer is normally in charge of each part of ship and he is responsible for its cleanliness and efficient functioning.

A SHIP AT SEA

In a ship at sea, the organization is very simple. The Captain delegates his authority to the Officer of the Watch to be the *driver*, as it were, and to be responsible for the ship's efficient passage and safety. The Captain, of course, is always available to advise the Officer of the Watch and he may spend a good deal of time on the bridge with that officer.

The administration of the watch on deck is done by the Petty Officer of the Watch. He details his watch for their various duties and sees that lookouts, helmsmen and so on are relieved often enough to keep them at their best efficiency. The Petty Officer of the Watch also details off the sea boats crew. He may delegate the Leading Seaman of the Watch to look after the sea boat.

In the engine room, the watch is closed up under a petty officer or chief petty officer engineering technician. The various jobs ire detailed off in the same way as the petty officer of the upper decl, watch has done. The engineering officers are always available to offer advice and they spend a good deal of time in the engine room and boiler room. The man in charge of the engine room watch is responsible to the Officer of the Watch that all orders from the bridge are carried out perfectly and that the engines are tun efficiently. A part of the engine room watch is responsible for running the auxiliary machinery about the ship.

Similarly, under the control of the Officer of the Watch, a watch of radar plotters is closed up on their sets and the sonarmen may be closed up on their sets. These watches may be administered by either a leading seaman or a petty officer of the appropriate trade. They report their detections directly to the bridge. A watch of radiomen will be closed up at their sets and a duty signalman will be available on the bridge to advise the Officer of the Watch and to perform any communications work necessary.

It is clear by now that at sea each department has a watch of men closed up to do their part in the running of the ship.

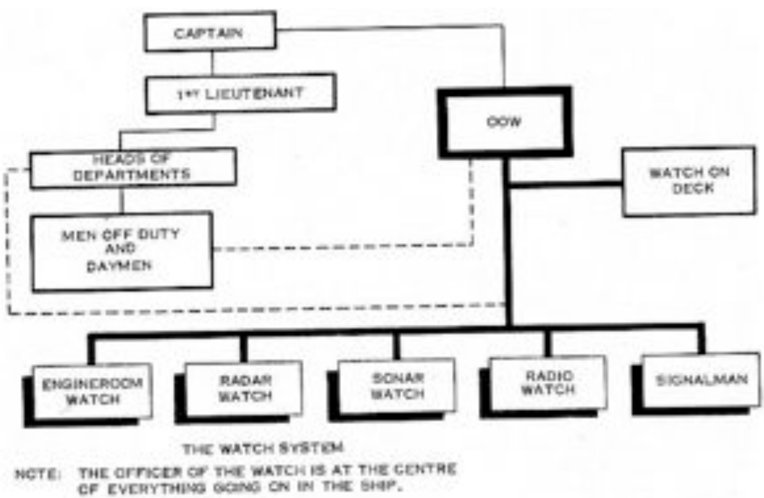


Figure 11–5

Since the Officer of the Watch is directly responsible to the Commanding Officer for the running of the ship, it is necessary that all these watches work closely with him and keep him up to date about what is happening in the ship. Unless this is the case, the whole system breaks down.

ROUTINE

You have seen that all those people who are not actually on watch work with their departments or on housekeeping duties during the normal daily working hours. In the forenoon, hands fall in either for divisions or to be detailed off for work. Department officers and chief and petty officers outline the day's work at this time and the hands are given their jobs. Persons who have stood the morning watch fall in later when they have finished breakfast and those with the afternoon watch secure early enough to have their lunch.

Daily sea routines are always laid down in First Lieutenant's (Executive Officer's) standing orders and a copy of these is always on the notice board. This routine should be learned perfectly. It will vary from ship to ship but in general it follows the same lines an example starting with the morning watch at sea might be:

0600	-	Call the men under punishment
0625	-	Men under punishment out pipes
0630	-	Call the hands, men under punishment to muster
0700	-	Hands to breakfast and clean; dress of the day Men under punishment secure
0750	-	Forenoon watchmen, out pipes
0755	-	Out pipes, forenoon watchmen to muster
0800	-	Hands to divisions and prayers, morning watchmen to breakfast
0855	-	Morning watchmen out pipes
0900	-	Morning watchmen to muster
1030	-	Stand easy
1040	-	Out pipes, hands carry on with your work
1100	-	Afternoon watchmen to dinner

1130	-	Up spirits.
1150	-	Clear up decks, afternoon watchmen out pipes
1155	-	Secure, hands to muster for grog. Afternoon watchmen to muster
1200	-	Hands to dinner
1230	-	Men under punishment to muster
1310	-	Out pipes.

The Executive Officer is responsible for making this routine, the Coxswain is responsible for seeing that it is carried out and every individual person is responsible for knowing it and for being at the right place at the right time. The quartermaster pipes the routine with his boatswain's call, but not having heard a pipe is never an excuse for not being where you should be when you should be.

A SHIP IN HARBOUR

The routine varies a little for a ship in harbour. It is obviously not necessary for a watch to be closed up at all times and so all hands work with their departments or housekeeping and maintenance during working hours. One watch is always required on board as the duty watch, but it is seldom mustered during working hours. Normally the watch is duty from noon to noon and musters for the first time immediately after secure. At this time, the duty watch is detailed off and exercises fire stations.

In the engineering organization, watchkeepers for the machinery which is kept running in harbour are detailed off from the duty watch.

In harbour, quartermasters, whose job it is to man the gangway constantly and pipe the routine alternate on watch for a 24 hour period and then are given 24 hours leave. Similarly, cooks and stewards may run a special routine since their jobs keep them closed up on duty at odd hours during the day and night.

The main object of the organization of a ship in harbour is to be able to cope quickly and adequately with any emergency which may arise and to be able to prepare the ship to go to sea at very short notice.

ACTION STATIONS

In an action, a ship is so organized that every essential service is manned and all weapons are manned and ready for use. To achieve this state means that every man in a ship has an action station. The duties he is required to perform in an action may be appropriate to his trade, but they may be something entirely different. For example, a cook or a steward may handle ammunition at his action station and a writer may be a part of a guns' crew. However, the most experienced men man the positions where their experience is most useful.

EMERGENCY STATIONS AND ABANDON SHIP

If a panic arises when a ship begins to sink, many more lives will be lost than necessary. To avoid panic, every man in a ship is given a position to occupy just prior to abandoning ship. This position is known as his emergency station. Damage control parties remain at work at their emergency station and the remainder of the ship's company is employed preparing to launch the rafts and lower the boats or are mustered on the upper deck opposite their boat station in readiness to leave quickly and quietly when the order is given.

WATCH AND STATION BILL

So that everyone knows his part in the organization of a ship, a watch and station bill is published by the Executive Officer and kept up to date by the Coxswain. The information on this bill may vary slightly from ship to ship but basically it lists each watch of men in order of their part of ship in the following manner.

The watch and station bill is posted in a prominent place

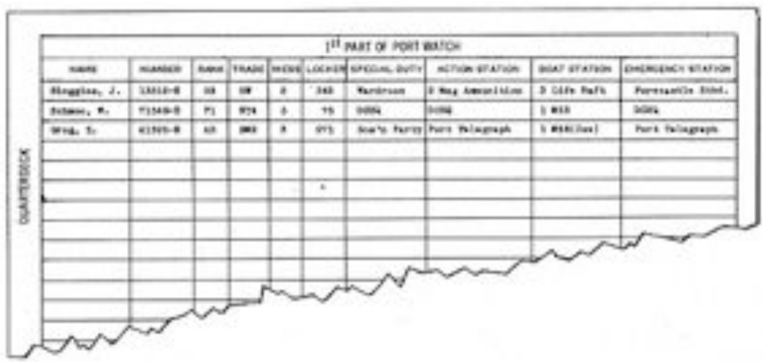


Figure 11–6 Watch and Station Bill

in every ship so no man has any excuse for not knowing his various stations.

SPECIAL PARTIES AND HOUSEKEEPING WORK

You have seen by now that the work in a ship is split up into three types. There is the work required for running a ship at sea; the jobs of routine maintenance of machinery and equipment; and the general housekeeping chores. The watch and part of ship organization deals with the running of the ship, but how, exactly, are the hands organized for routine maintenance and housekeeping?

Again it is a very simple system. In conjunction with the Executive Officer, the officers and chief and petty officers in charge of departments decide how many men of which particular trades they need to do their departments' chores. These men form special parties and the remainder of the men are allocated to the Chief Boatswain's Mate to be detailed off for housekeeping duties. For example, when the hands fall in in the forenoon, there may be a radar party, a weapons party, a boatswain's party, etc., made up, in each case, of men of the appropriate trade. These men will fall in separately and carry on with their work as soon as the hands have been mustered and reported. The Chief Boatswain takes charge of the rest and details them either to work with their parts of ship or to work in their own housekeeping parties such as the mess-decks cleaning party or a painting party.

Two special parties which are maintained on board at all times deserve special attention. These are the landing and boarding parties.

The landing party is an armed group, under the command of an officer, which is frequently exercised in the use of small arms and demolitions. It may be required to land to ,Assist civil authorities to keep order, or it may be landed in enemy territory to carry out some special function. This party will consist mainly of weaponmen and a few boatswains.

The boarding party is required to board enemy merchant and war vessels. It should be able to prevent an enemy ship from scuttling herself, and it should be quick to find out a great deal of information about any ship which may be boarded. For these reasons, the boarding party will be made up mainly of men of the engineering trades. There will also be radiomen and a few boatswains in this party.

QUIZ

1. Why not speak of branches in the service?
2. What are the duties of the captain and executive officer in a ship?
3. Explain how the departmental system works in a ship.
4. What are the systems of watchkeeping which may be used in a ship?
5. What is a dayman?
6. In a ship at sea, what do the men off watch do?
7. What are the "parts of ship,"and why is a ship divided thus?

8. Where does the officer of the watch come into the watchkeeping organization?
9. Where will you find out the details of daily routines?
10. what is a “watchkeeper” in a ship in harbour?
11. Where do you find out your emergency station?
12. What is a special party?

The answers to these questions may be found in Chapter 11. When you can answer all of these questions perfectly, you may consider yourself to have a fair grasp of this chapter.

Chapter 12

KIT AND CLEANLINESS

Every man is issued a full kit on entry into the R C N. He is required to keep his kit complete and in good condition. If any items of kit are not available when a man first draws his kit, the cost of these items is paid to the man and it is his responsibility to obtain the articles as soon as they become available.

Suppose the clothing store was out of greatcoats when you drew your kit. The clothing store would pass the word to the pay office who would credit the price of a greatcoat (around $30.00) to your pay record (see Chapter 13). You would receive this money in your next pay, and when greatcoats were again available, your Divisional Officer would require you to purchase one.

Kit and Upkeep Allowance

To assist him in keeping his kit up to date, a *Kit Upkeep Allowance* is paid to every man in the service. This amounts to over $80. 00 a year, and should be plenty to replace worn-out articles. Kit upkeep allowance is *not* provided for repairing shoes or for dry cleaning and laundry expenses. A man would have these day-to-day expenses whether or not he was in the service. A seaman should think of his kit upkeep allowance as a *replacement allowance*.

During his first three years in the Navy, a man will probably have to replace one uniform. He may need a half dozen pairs of socks and a half dozen pairs of underwear. He will need about three white fronts and three collars, two silks and a half dozen lanyards. He may require three caps and a few buttons and some sewing gear. It has been found from actual experience that very little else is required to keep a kit in first class condition. This amount of kit could be purchased *five times* over for the amount of kit upkeep allowance which is paid in three years. In fact, *in a little over four years, a man can completely replace his kit using kit upkeep allowance only*.

As if this weren't sufficiently generous, the Navy replaces worn-out working dress free of charge. Your working shirt and trousers may be replaced after six months, and your working jacket after eighteen months.

Is it any wonder that there is no excuse for not having a complete kit?

Kit Marking

The simple fact of it is, that if you possess a piece of unmarked kit, you cannot prove that it belongs to you. If you loose it, it will not be returned. If it is stolen, the thief has nothing to worry about. It takes about a half a minute to mark an article of kit– it may save half a day's worry. Kit which cannot be marked must be sewn.

Figure 12–1 Properly Sewn Towel

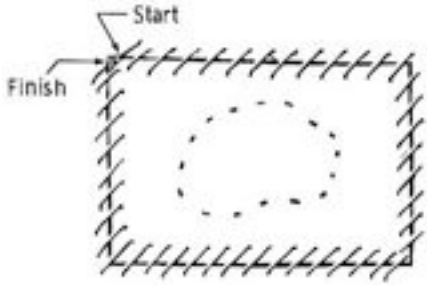


Figure 12-2

Kit Maintenance

A man looks neater and feels more comfortable when wearing a well maintained kit. A well maintained kit lasts longer and saves expense. Holes should be patched or darned while they are still very small. Frayed edges should be turned as soon as they start to fray.

The proper way of sewing a patch is shown in Figure 12-2. Make the patch sufficiently large to cover the hole and all weakened material. Finish off by making a reef knot with the starting thread.

The proper way of darning is shown in Figure 12-3.

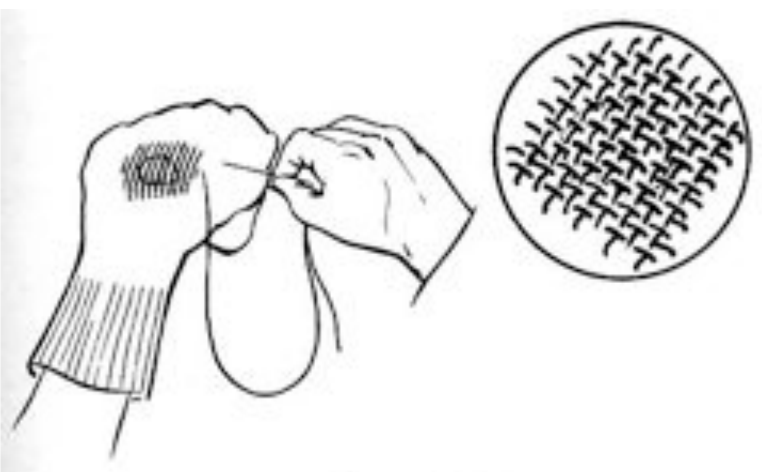


Figure 12-3

Make a fist in the sock with one hand, holding the needle with the other. Starting well above the hole, sew strands across the hole, hauling taut but not drawing the sides together. Then weave strands the other way across the hole-over one, under one, over, etc.until the hole is completely woven over. Finish off by making a half hitch around the last strand.

In the Navy, washing is called *dhobeying*. Dhobi is an Indian word meaning washerman. There are several hints on dhobeying which it will be well to study.

1. Before washing clothes, make sure all of the pockets are empty. Pens, tobacco, indelible pencils and so on will stain clothing badly.
2. Do not rub soap directly into the clothes. Make soapy water in the wash tub first, and then put in the clothes.
3. Rinse clothes well. If any soap is left to dry in whites, it will turn them yellow.
4. Dhobey blues and whites separately. Blue dye often runs.
5. Do not scrub collars with a brush. They will turn light blue soon enough with ordinary washing, and when they do, they should be converted into boot polishing rags. Some seamen have the odd idea that a light blue collar makes them look "salty."
6. When dhobeying plastic caps, use cold water and a detergent. Hot water makes this type of plastic turn yellow.
7. Keep up to date with your dhobeying. A small dhobey every night is far easier than a large one every week.
8. Do not dry dhobeying in living quarters. It is extremely unhealthy.

Pressing and Rolling

All articles of kit except woolens should be ironed after they have been dhobeyed and dried. After ironing, all except blue and white uniforms should be rolled and stowed if they are not intended for use in the immediate future. Locker facilities are provided in most ships for the hanging of blue or white uniforms. It is as well to purchase a plastic hanger bag for uniforms which are not in use.

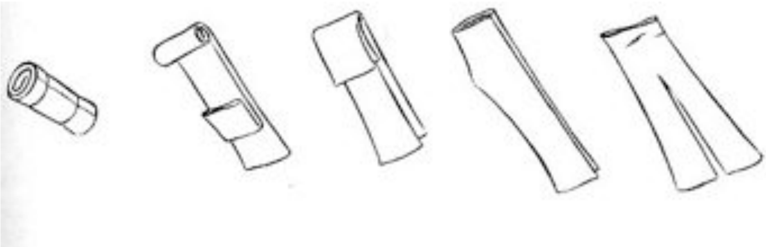


Figure 12–4 Working Trousers

Working Trousers

Turn inside out, standing at the bottom end, fold right side over left; fold the waistband over to the middle of the leg; fold the top cuff over about six inches; roll toward the cuff, and stop with twine using a reef knot.

Working Shirts

Button front and sleeves; turn the sleeves inboard twice, turn the collar inboard; commence rolling from the tail; stop with twine using a reef knot.

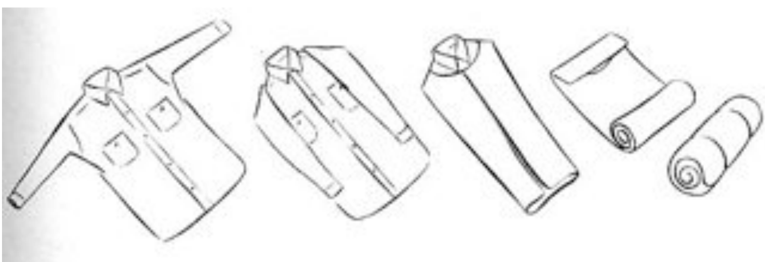


Figure 12–5 Working Shirts and Jackets

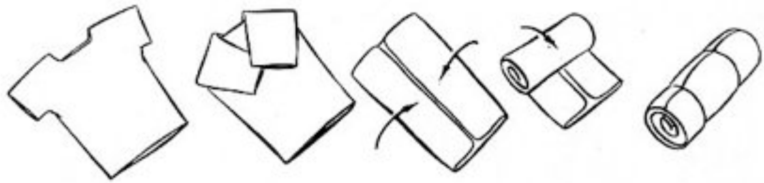


Figure 12–6 Vests

Vests and Utility Shirts

Turn inside out; turn sleeves inboard twice; roll from top to tail; stop with twine using a reef knot.

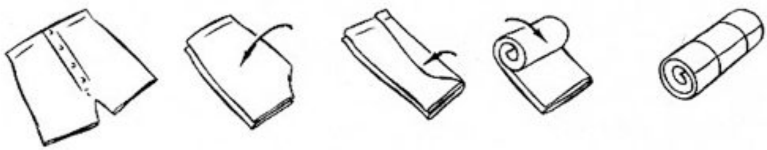


Figure 12–7 Undershorts

Undershorts

Fold leg over leg; fold the crotch inboard to make the sides square; roll from waist to cuff; stop with twine using a reef knot.

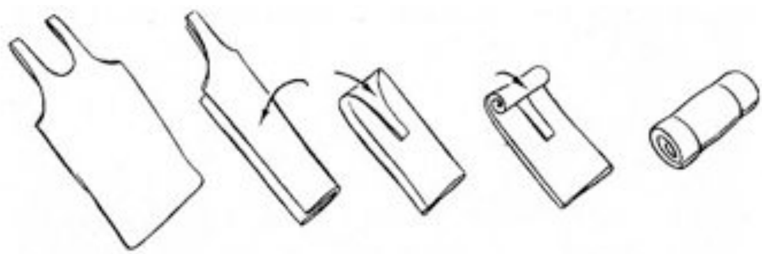


Figure 12–8 Undershirts

Undershirts

Fold lengthwise; fold shoulderstraps inboard; roll from shoulder to tail; stop with twine using a reef knot.

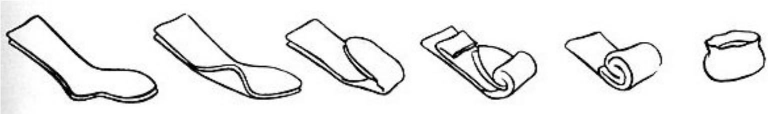


Figure 12-9 Socks

Socks

Lay the socks together; turn heel inboard; fold toe up over heel, turn the top sock back a few inches; roll from the toe end; stop with twine using a reef knot.

Figure 12-10 Jerseys

Jerseys

Turn inside out, turn sleeves inboard twice, roll from neck to tail; stop with twine using a reef knot.

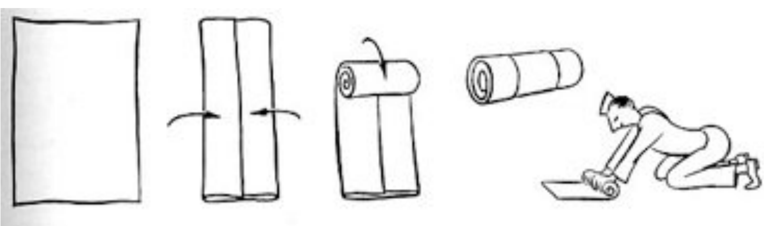


Figure 12-11 Towels

Towels

Turn both edges inboard to meet in the middle; fold toward marked end; stop with twine using a reef knot.

Blankets

Roll in the same way as a towel except fold edges inboard twice before rolling.

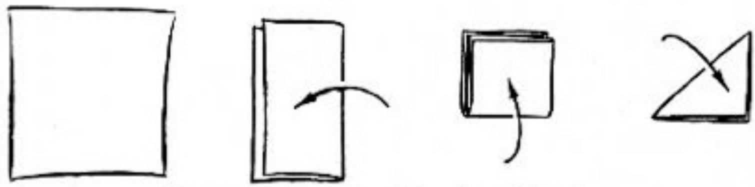


Figure 12–12 Handkerchiefs

Handkerchiefs

Fold into four, and then fold diagonally.

These are the methods of folding the main articles of kit. For the other articles, follow these general principles.

MARKING

Kit should be marked so that your name and number shows on each article when it is rolled.

Working Trousers

Turned inside out, mark on the outside bottom of one of the legs. When rolling, the marking is face down.

Working Shirts

Across the middle of the back near the top, and over the left hand pocket.

Vests and Utility Shirts

Turn inside out and mark on the back shirt tail.

Undershorts

On the outside bottom of one of the legs; face down for rolling.

Undershirts

On the left side of the back tail.

Jerseys

Turned inside out, on the back bottom edge; face down for rolling.

Towels

Mark in the middle of one end. Face down for rolling.

Blankets

Mark in the middle of both ends.

Small articles of kit such as handkerchiefs, gloves, socks, housewife, etc., need only be marked with initials. Those articles which do not readily take marking ink should have the name and number sewn in. Sewing is a far more permanent way of marking kit. You should sew as many articles of kit as you can most particularly those articles which last a long time, like greatcoats and uniforms. However, collars should never be sewn because the sewing will show through when they are ironed.

Greatcoats are marked inside in the middle of the back.

Uniform jumpers are marked under the collar.

Uniform Trousers are marked inside the waistband.

KIT MUSTERS

There are five reasons for having kit musters. Your Divisional Officer wishes to know if you have all of your kit; if it is in good repair; if it is clean, if it is properly marked; and if you have any articles you shouldn't have. After completion of new entry training, your kit is mustered every time you are drafted, and probably once every six months or year that you are in any particular ship. Leading seamen and below are required to have kit musters. A petty officer second class may be ordered by the Captain to muster his kit. Petty officers first class and above are not required to have kit musters, but they may be required to sign their kit list saying that their kit is correct.

Every man who graduates from new entry training leaves CORNWALLIS with a near-perfect kit. It would be foolish to expect a man in an operational ship to have as much time to work on his kit as he had in CORNWALLIS. However, a man's kit should always be complete, clean and in good repair. This takes very little time and energy. Also, when you have a kit muster in a ship, you will be expected to have your kit rolled and laid out properly. This may require a couple of hours work the night before the muster.

Figure 12–13 Kit Muster

Some people reckon that length of time in the service is an excuse for a shoddy kit. Exactly the reverse is true. A leading seaman, for example, is expected to have a far better kit than an able or ordinary seaman for the simple reason that a leading seaman is setting an example for all those below him in rank.

Excuses

While there are a great many excuses for shoddiness in a kit, there has not been a new excuse invented in the past twenty years. Here are some of the common excuses which will not be accepted:

1. “It is in the drying room.”
2. “ I left it at home.”
3. “It was stolen.”
4. “1 didn’t have time to mark it because I only got it yesterday and I was on duty last night. ‘I
5. “It is at the laundry or shoemaker’s or tailor’s.”
6. “1 lost it. ‘I
7. “The button fell off ten minutes ago.’j
8. “1 didn’t know my kit was going to be mustered.”

Perhaps the most ridiculous of all excuses is: “I didn’t have enough money to buy it.” If this is the case, your Divisional Officer may request the ‘Captain to approve an advanced payment or casual and order you to purchase the required articles of kit. You would then find your pay rather short for the next month or two.

Plainclothes

Civilian dress is properly called *plainclothes* in the service. All men may wear plainclothes when they are on leave. In a shore establishment a man may proceed ashore and return off leave in plainclothes (except for new entries), and he may be in plainclothes in his own canteen, mess, or place of recreation.

In a ship there is just not room to stow plainclothes and no man is permitted on board in this rig.

Rigs

The uniform of Petty Officers Second Class and below is called *Class II* uniform. That of Petty Officers First Class and above is called *Class I* uniform. There are eight different rigs which a man in Class II uniform may be ordered to wear. For ease of reference, they are given numbers.

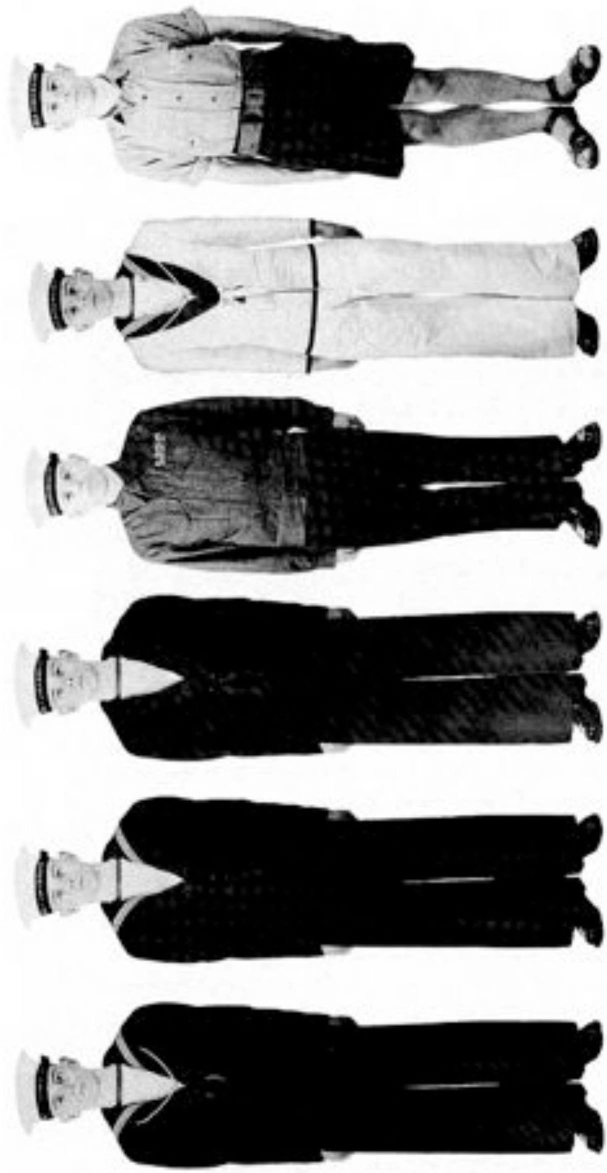


Figure 12–14 Number

Figure 12–15 Number

Figure 12–16 Number

Figure 12–17 Number

Figure 12–18 Number

Figure 12–19 Number

Class II Rigs

Number One Dress

This is your best blue uniform with gold badges, and medals. A collar, lanyard, and scarf are also worn. You would wear this uniform on inspections or ceremonial occasions.

Number Two Dress

This is your second best uniform. It may have either red or gold badges, and you wear a collar, lanyard and scarf. Medal ribbons only are worn. This is the uniform you wear on leave or duty ashore, and on Sundays or holidays onboard.

Number Three Dress

This is your working blue uniform. It is the same rig as number two with red badges, except that no lanyard is worn. This is worn during working hours unless number five uniform is ordered.

Number Four Dress

This is night clothing. It is similar to number two dress with red badges except that neither lanyard nor collar are worn. Night clothing is normally worn on board between secure and pipe down.

Number Five Dress

This is working dress. Working trousers, working shirt, and working jacket with red badges are worn. This is the normal working rig at sea.

Number Eleven Dress

This is the same as number one dress except that white jumper and trousers are worn instead of blue. It is used in hot climates instead of number one dress.

Number Thirteen Dress

This is the same as number two dress except that white jumper and trousers are worn instead of blue. It is used in hot climates instead of number two dress.

Number TwentyFive Dress

This is working dress in a ship in a hot climate. It consists of blue shorts, working shirt and sandals. It is worn during working hours on board.

Numbers two, three and thirteen dress may be ordered "negative jumpers." Number five dress may be ordered "negative jackets." In number five dress negative jackets, it is normal to wear the sleeves tolled up neatly.

Caps are worn so that the rim of the cap is the width of one finger above the eyebrow. The centre of the lettering on the cap talley is in line with the nose, and the bow is over the left ear. The ends of the bow shall be of equal length, not exceeding two inches.

The scarf (or *silk*) is worn so that only one to two inches of bight hang below the tapes. The bows of the tapes should each be of equal length and one and one-half to two inches from end to centre of the knot, and the tape pendants should be of an equal length of from five to seven inches, swallow tailed at the ends.

The lanyard is worn under the scarf at the back, and emerging from the scarf at the same place as the scarf emerges from the collar. The running Turk's head should rest just above the "V" of the silk, and the standing eye of the lanyard is then led to the right between the scarf and the jumper and back to the left between the scarf and jumper leaving a bight under the tapes.

In dress, as in everything else, there are a number of "DON'T's" involved.

DON'T misshape your cap.

DON'T paint your cap.

DON'T tie an odd-shaped bow in your cap talley.

DON'T wear a shrunken lanyard.

DON'T wear a faded collar.

DON'T carry half your kit under your jumper.

DON'T wear tapes too short or too long, or with frayed ends.

DON'T turn your sleeve cuffs back.

You may think you look salty when you break dress regulations, but remember this: to a real seaman, you look ridiculous. Real seamen do not go out of their way to attract attention

Figure 12–20 Salty?

Buying Clothing

In the Navy it is illegal to buy uniform clothing from other sailors. There are very good reasons for this. Suppose during a kit muster your Divisional Officer sights a towel marked with someone else's name as well as your own. He says: "Where did you get this towel?" You say: "I bought if from Able Seaman So-and-so, Sir." Now Able Seaman So-and-so left the ship six months before. How does your Divisional Officer know whether you bought it, stole it, or found it sculling and kept it? Perhaps there is a rash of thefts going on in the ship at the time your Divisional Officer would not be human if he did not put two and two together and become suspicious of you. So, you see, the rule about purchases of clothing protects you as well as every other person in the ship. Don't think that this kit muster tale is farfetched... just such occurrences happen all too frequently in our ships.

There is one other very good reason for not buying kit from shipmates. You know that what you purchase from stores is new and in good condition. Can you say the same about what you might buy from a shipmate?

The Scran Locker

In a ship, there is about enough room for all the equipment and personal gear which must be carried, never more, but sometimes a good deal less. If you leave gear sculling, it must be disposed of. One way of disposing of such gear would be to dump it over the side. Then untidy people would be continually in debt from buying new gear. Fortunately for a great number of modern day seamen, the navy does not allow this practice. Instead, gear found sculling is put in a locker called the scran locker. This locker is normally opened once a day, and gear may be recovered for a nominal fee.

In the old days, a piece of soap was the price for recovering gear from the scran locker. Soap was a precious commodity in those days. Nowadays, each article costs five or ten cents, and the proceeds go to the ship's fund. Of course, if you have gear in the scran locker too regularly, disciplinary action will be taken.

Every so often the scran locker is cleared and any unclaimed articles of kit are assumed to have no owner. In these cases, the clothing is called declared clothing and returned to the clothing store. It is marked with the letters D C; the original name is obliterated, if possible; and the clothing is resold. The D C mark is proof that you have actually bought the clothing.

In peacetime, when a shipmate dies it is traditional to auction his kit and pay the proceeds to his widow or relatives. This will also be declared clothing. Often the kit sells for many times its value for obvious reasons.

Figure 12–21 Declared Clothing

QUIZ

1. Exactly what is kit upkeep allowance intended to provide?
2. Why mark your kit?
3. Why do you have kit musters,even after you have finished new entry training?
4. What are the rules about plainclothes? Why?
5. How long should the lower bight of a silk be? How long should tape pendants be? What is the correct position of the running Turk's head of your lanyard?
6. Why not buy clothes from your shipmates?
7. What is the scran locker? Why?
8. What is declared clothing?

The answers to these questions may be found in Chapter 12. When you can answer all of these questions perfectly, you may consider yourself to have a fair knowledge of this chapter.

CHAPTER 13

ADVANCEMENT AND PROMOTION, DOCUMENTS AND PAY

What is structure?

By structure is meant the way the various ranks, such as petty officer, able seaman, or rear admiral, and tradesmen such as sonarman, engineering technician, etc., are arranged and allocated to make the whole of the RCN into a tightly knit team. For example, there is very little point in having more chief petty officers than leading seamen and below, or more sonarmen than are needed in the ships we possess.

In 1957 a committee of senior officers examined the structure of the Navy as it existed then, and decided that a great number of changes should be made to improve the efficiency of the Navy. The problems which they met are worthwhile studying if one is to understand why the Navy is the way it is.

First of all, the structure had to be arranged so that the ships and aircraft of the Navy would be fully manned and in the best state of readiness for any job that needed doing. At the same time, in this scientific age when equipment is changing all the time, the structure had to be able to change with the Navy in a word, it had to be flexible. So these were the first two problems: readiness and flexibility.

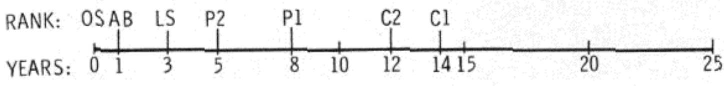
The next problem was one of pure common sense. If a man has the brain of an Einstein he should certainly not remain for long as an ordinary seaman. But, by the same token, if he doesn't have a first class brain he should not be a rear admiral. Again, some people have a natural ability for mechanical things, so they should study one of the engineering trades rather than become cooks or stewards. In other words, the Navy wants to put people in the rank and trade where they can best make use of their talents. It is a matter of putting round pegs in round holes. This boils down to selecting the right jobs for the right men, and promoting these men according to their merits. So you may call these problems selection and promotion.

The last major problem was to make the Navy an attractive lifetime career for young Canadians. Either men must want to be in the Navy, or else the Navy does not want them. You may call this problem careers.

Having determined all these problems readiness, flexibility, selection, promotion, and careers the committee of officers devised a new structure for the Navy, and that is the structure under which we are now working. As you study this chapter, you should remember the problems, and try to understand how the present structure deals with them.

In reading the explanations on how a man is promoted in rank and advanced in trade there is one very important point to remember. Not every person who joins the Navy can hope to become a chief petty officer or even a petty officer. It is easy enough to see that if this were the case the Navy would very soon be top heavy with men in the higher ranks. In other words, some men may serve for twenty-five years and not be promoted beyond the rank of petty officer. It should be quite clear to everyone that the fact that a man does not become a chief petty officer is nothing to be ashamed about.

A petty officer second class who does a first-rate job has more reason to be proud than a chief petty officer first class



MINIMUM TIMES FOR PROMOTION IN RANK
Figure 13-1

who does a second-rate job. Furthermore, the petty officer in this case is of more value to the navy than the chief petty officer.

Similarly, not every man in the service will be advanced to trade group four. The reason for this is quite plain for example, not every modern singer can be Bing Crosby. Although he may be a proficient entertainer, lie does not rise to the professional level of a top rank star. In the same way, a man may have reached his peak at the trade group three level. If this is the case, he is most valuable to the Navy, and he is happier himself at this professional level.

Do not try to reach above your capacity, and at the same time, do not be happy with anything less than you know you are capable of. Look at the men senior to you and ask yourself two questions (a) could I do their jobs? (b) do I want to do their jobs? Unless both answers are “yes”, do not aspire to the next higher rank or trade group.

Trade Structure

A good seaman must know his own job thoroughly as well as the jobs he gives to other people. It follows, then, that as a man is promoted in rank, he must also advance in trade. At first glance, the trade structure of the RCN seems complicated, but as you become familiar with it, it will be easier to understand.

First of all, let us see the difference between trade and rank. Trade denotes the job a man performs with particular specialized things machinery, rope, paper, etc. Rank denotes the job a man performs with general things in a ship, and more important, with people junior or senior. As we have just seen and will see in more detail later, these two jobs are related much of the time.

Now trades in the service are related one to the other just as they are ashore. In building a house it would be useless to have carpenters without masons, electricians, painters, plasterers, etc., and in the same way, it is useless to try to use a gun with weaponmen surface but no firecontrolmen, or electronic technicians. You have seen in Chapter eleven how many trades are involved in the repair of small piece of gunnery equipment, so in the same way, use and normal maintenance of all the equipment on board involves the cooperation of many trades.

The object of the trade structure now in effect in the RCN is to provide well-balanced ships' companies. It also permits those people who wish to get ahead to do so in their own time rather than having to wait either for promotion in rank or for a formal course. At the lowest level there are about 25 trades.

DECK, WEAPON AND CONTROL TRADES

The Boatswain (BN) is the specialist seaman. It is necessary for everyone in a ship to know some seamanship, but it is also necessary to have a group of men who have an extensive

DECK, WEAPONS AND CONTROL GROUPS

LABOUR LEARNING PERIOD STANDARD AND TRADE GROUP ONE	TRADE GROUP TWO	TRADE GROUP THREE	TRADE GROUP FOUR
BOATSWAIN	BOATSWAIN	BOATSWAIN	BOATSWAIN
SIGNALMAN	SIGNALMAN	SIGNALMAN	SIGNALMAN
WEAPONMAN SURFACE	WEAPONMAN SURFACE	WEAPONMAN SURFACE	WEAPONMAN SURFACE
WEAPONMAN UNDERWATER	WEAPONMAN UNDERWATER	WEAPONMAN UNDERWATER	WEAPONMAN UNDERWATER
SONARMAN	SONARMAN	SONARMAN	SONARMAN
FIRECONTROLMAN	FIRECONTROLMAN	FIRECONTROLMAN	FIRECONTROLMAN
RADIOMAN	RADIOMAN	RADIOMAN	RADIOMAN
RADAR PLOTTER	RADAR PLOTTER	RADAR PLOTTER	RADAR PLOTTER
RADIOMAN (S)	RADIOMAN (S)	RADIOMAN (S)	RADIOMAN (S)
		ELECTRONIC TECH	ELECTRONIC TECH

Figure 13-2 Deck, Weapons and Control Group

knowledge of this extremely complicated subject. In addition to this, the boatswain does training in navigation and ship's maintenance. In the higher trade groups the boatswain will be responsible for ship's routine and parade training.

The Signalman (SG) handles communications of all types except radio telegraphy. Besides actually receiving messages, he must be able to interpret them and advise the command of their meaning.

The Weaponman Surface (WS) operates and maintains all the guns and missiles in the ship. He is also responsible for the stowage and safety of surface weapon ammunition carried on board.

The Weaponman Underwater (WU) operates and maintains all the underwater weapons in the ship. This includes torpedoes, antisubmarine mortars, and mines. He is also responsible for the various devices used to launch these weapons, for minesweeping gear and for the stowage and safety of underwater weapon ammunition and demolition explosives carried on board.

The Sonarman (SN) operates and maintains the sonar sets in the ship. He is required to interpret the targets he detects, and he should be able to determine water conditions.

The firecontrolman (FC). The equipment used nowadays to keep guns tracking their target and allowing for throw off is in most cases, very complicated. The firecontrolman maintains this equipment and operates the radar sets used in conjunction with it.

The Radioman (RM) does precisely as his name implies. He is responsible for receiving and transmitting messages efficiently by radio. He must also maintain his equipment and rig emergency sets in case of damage.

The Radioman (S) (RS) must have the same basic trade skill as the radioman, and in addition he must maintain and operate the equipment used in electronic warfare.

The Radar Plotter (RP) operates and maintains the radar sets in a ship. He should be able to plot the targets he picks up, and tell the Captain exactly what they are doing. He must also man a station of a voice radio net.

It may be seen by now, that the Deck, Weapons and Control Group is concerned mainly with fighting the ship and keeping her weapons and associated equipment in such a condition that she can fight.

The Engineering Trades

The *Engineering Mechanic (EM)* needs a basic knowledge of all main propulsion and auxiliary machinery. He will help to maintain this machinery and to operate it. He will also be required to assist in repairing machinery.

ENGINEERING GROUPS

LABOUR LEARNING PERIOD STANDARD AND TRADE GROUP ONE	TRADE GROUP TWO	TRADE GROUP THREE	TRADE GROUP FOUR
ENG. MECHANIC	ENG. MECHANIC	ENG. TECHNICIAN	ENG. TECHNICIAN
ELECTRICIAN'S MATE	ELECTRICIAN'S MATE	ELECTRICAL TECHNICIAN	ELECTRICAL TECHNICIAN
HULL MECHANIC	HULL MECHANIC	HULL TECHNICIAN	HULL TECHNICIAN

Figure 13-3 Engineering Group

The Hull Mechanic (HM) is primarily interested in repair and the ABCD aspects of engineering. He must be an expert at maintaining and operating all the ABCD equipment in a ship as well as repairing the ship's structure and fittings.

The *Electrician's Mate* (LM). The Electrician's Mate is responsible for the efficient operation of all the extensive electrical power systems and machinery in a modern ship. This does not include electronic equipment. When you consider that the modern ship is almost totally dependent upon electricity in everything it does, you will understand just how large a job the LM has.

Supply and Clerical Trades

Napoleon once said that an army travels on its stomach. This is as true today as it was at the beginning of the 19th century. Applied to our service, we may say that a navy travels on its supplies.

CLERICAL AND SUPPLY GROUPS

LABOUR LEARNING PERIOD STANDARD AND TRADE GROUP ONE	TRADE GROUP TWO	TRADE GROUP THREE	TRADE GROUP FOUR
ADMIN WRITER	ADMIN WRITER	ADMIN WRITER	SHIP'S WRITER
PAY WRITER	PAY WRITER	PAY WRITER	SHIP'S WRITER
NAVAL STORESMAN	NAVAL STORESMAN	NAVAL STORESMAN	SHIP'S STORESMAN
VICTUALLING STORESMAN	VICTUALLING STORESMAN	VICTUALLING STORESMAN	SHIP'S STORESMAN
COOK	COOK	COOK	COMMISSARYMAN
STEWARD	STEWARD	STEWARD	COMMISSARYMAN

Figure 13-4 Supply and Clerical Group

The Administrative Writer (AW) is the ship's secretary. A great volume of correspondence, reports, orders, etc., passes in and out of an efficiently running ship and the administrative writer must keep a record of all these. For example, if the Captain wishes to know what the Admiral said about the ship's last inspection, he sends for his administrative writer. In addition to this, the administrative writer is responsible for personnel records.

The Pay Writer (PW) does just as his name implies. He is normally the most popular man in the ship twice a month. A destroyer escort may have a two-weekly payroll of over $30,000, and pay writers are employed to calculate the amount of pay due to each officer and man and to record all payments made. He also assists in such financial transactions as assignments Of pay, traveling and moving expense claims, etc.

The Naval Storesman (NS) General stores includes all types of stores except food, clothing and canteen supplies. The Naval Storesman is required to keep a check on what

the ship has at any given time and what it needs. Above all, he must be able to produce quickly and in good condition
any one of the thousands of items of stores if he is called on to do so. lie also keeps accurate accounts of all items of general stores received and issued.

The Victualling Storesman (VS) handles food, clothing, and canteen supplies. He is responsible that these stores do not spoil and that there is enough to go around at all times.

Cooks and Stewards (IK) and (SW) contribute a great deal towards the happiness of a ship's company. A good steward serving breakfast in the wardroom can put the First Lieutenant in a good mood just before he sees defaulters. The Cook is responsible not only for cooking good meals, but also for ensuring that the galley and its equipment are spotlessly clean. From a health protection aspect his work is of utmost importance. A steward, on the other hand, keeps officers' quarters perfectly clean, and his attention to their wellbeing may have a profound effect on the whole ship's company.

MEDICAL GROUPS

LABOUR LEARNING PERIOD STANDARD AND TRADE GROUP ONE	TRADE GROUP TWO	TRADE GROUP THREE	TRADE GROUP FOUR
MEDICAL ASSISTANT	MEDICAL ASSISTANT	MEDICAL ASSISTANT	MEDICAL ASSISTANT
		RADIOGRAPHER	
		LAB ASSISTANT	
		HYGIENE ASSISTANT	
		OPERATING ROOM ASSISTANT	
		THERAPY ASSISTANT	
		CLINIC ASSISTANT	

Figure 13-5 Medical Group

Medical Trades

Relatively few medical tradesmen are carried in ships, but when they are, their responsibility is out of all proportion to their numbers.

The Medical Assistant (MA) is a jack of all trades in the medical world. He must be able to administer medicine, apply first aid and even perform minor surgery under emergency conditions. When a medical assistant is carried in a destroyer escort, he is responsible to the Captain for the health of all 190 officers and men of the ship's company. He must be able to recognize illnesses, and advise the Captain if a man is so seriously ill that a doctor's care is urgent.

Air Trades

You will not normally find tradesmen of this group in other than aircraft carriers and naval air establishments.

AIR GROUPS

LABOUR LEARNING PERIOD STANDARD AND TRADE GROUP ONE	TRADE GROUP TWO	TRADE GROUP THREE	TRADE GROUP FOUR
NAVAL AIRMAN	NAVAL AIRMAN	NAVAL AIRMAN	NAVAL AIRMAN
AIR FITTER	AVIATION TECHNICIAN	AVIATION TECHNICIAN	AVIATION TECHNICIAN
AIR RIGGER	NAVAL AIRCREWMAN	NAVAL AIRCREWMAN	NAVAL AIRCREWMAN
WEAPONMAN AIR	WEAPONMAN AIR	WEAPONMAN AIR	WEAPONMAN AIR
		AIR ELECTRICAL TECH	AIR ELECTRICAL TECH
		AIR ELECTRONIC TECH	AIR ELECTRONIC TECH

Figure 13-6 Air Group

The Naval Airman (AM) handles, secures and directs the movement of aircraft on the ground and on carrier flight decks. In addition he maintains safety equipment such as parachutes and dinghies and is an expert firefighter and ground search and rescue man.

The Air Rigger (AR) is responsible for maintaining and repairing all parts of the aircraft except the engine and the weapons. lie carries out routine tests and inspections and keeps a careful record of them.

The Air Fitter (AF) looks after aircraft engines and their associated gear. He too carries Out routine checks and inspections and keeps a careful record of them.

The Weaponman Air (WA) looks after the gunnery, rocket and

Miscellaneous Trades

These trades make up a very small part of the Navy. Few of its tradesmen are seen at sea.

MISCELLANEOUS GROUPS

LABOUR LEARNING PERIOD STANDARD AND TRADE GROUP ONE	TRADE GROUP TWO	TRADE GROUP THREE	TRADE GROUP FOUR
BANDSMAN	BANDSMAN	BANDSMAN	BANDSMAN
PHOTOGRAPHER	PHOTOGRAPHER	PHOTOGRAPHER	PHOTOGRAPHER
METEROLOGIST'S MATE	METEROLOGIST'S MATE	METEROLOGIST'S MATE	METEROLOGIST'S MATE
	P&RT INSTRUCTOR	P&RT INSTRUCTOR	P&RT INSTRUCTOR
	CLEARANCE DIVER	CLEARANCE DIVER	CLEARANCE DIVER

Figure 13-7 Miscellaneous Group

The Bandsman (BD) must be at the same time a good musician and a smart performer on the parade square. He must appear in public often, and a~ good bandsman is one of the Navy's best publicity agents.

The Photographer (PH) maintains and operates cameras and all other types of photographic equipment. lie may be of great use in an aircraft carrier, but otherwise he seldom goes to sea except on special assignments.

The Meteorologist's Mate (MO) is employed mainly in aircraft carriers on naval air stations where accurate weather information is very necessary.

PERSONNEL SELECTION

The trade a man gets depends on two things. One, of course, is personal choice. The Navy does not want to give a man a trade he doesn't like. The second factor is the result of tests given by the personnel selection officer. By these tests we can tell whether a man would be a good mechanic, a good cook, or a good boatswain, etc. The tests you are given are quite accurate they haven't just been dreamed up. Far from it they have been tried out on thousands of men. However, men are frequently found to be equally suitable for two or more trades. This is where choice comes into the picture once again. just to make sure that no man need be unhappy; if, when a man goes to sea, it is found that the selection tests have erred, the man may apply for transfer to some more suitable trade. It must be remembered however, that the number of men required in each trade is definitely limited and the Navy must keep each trade supplied with the required number of men to operate efficiently.

The Higher Trades

When you advance in your trade and learn more and more, you may find that your trade overlaps onto another related trade. Or you may find that there is one particular aspect of your trade for which you are particularly adapted. For these reasons, in the higher trade groups, some trades are combined and a few new ones are created.

Engineering mechanics will be given a special course in fitting techniques after trade group two. They then become skilled in the repair of all sorts of machinery.

All engineering mechanics become *engineering technicians* at trade groups three and four. Similarly, all electricians' mates become *electrical technicians* at trade groups three and four. *Electronic technicians*, who are experts in the repair of all types of electronic equipment such as sonar, radar, communication equipment, etc., are required at the trade group 3 and 4 levels. These tradesmen are selected from men in the Navy with the proper interest, aptitude and educational and technical background.

The clerical and supply trades begin to overlap somewhat at about trade group three. Therefore, in trade group four administrative and pay writers learn each other's trades and become *ship's writers*. Similarly, naval and victualling storesmen become *ship's storesmen*, and cooks and stewards become *commissarymen*. *Naval Aircrewmen* (NA), who act as members of an aircraft's crew and who operate communication and detection equipment in the aircraft are selected for training from any naval tradesman trade group one and then continue their career in this new field.

At trade group two air fitters and riggers learn each other's trades and become *aviation technicians*. Men of any trade with the necessary interest, aptitude and technical background may be selected for transfer to *air electrical* or *air electronic* technicians.

At the trade group two level, suitable men from any trade may qualify as *P. and R.T. instructors* or *clearance divers,* and then advance normally to trade group four.

Rank Structure

You have seen the various ranks of the Navy in Chapter 3. If you are a normal individual, you will have wondered, "How do I become a petty officer, and how soon?". The answer to both of these questions is that it depends almost entirely on yourself. If you show ability and make a good effort, you can become a petty officer in a relatively short time, (see Figure 13-1).

As an able or ordinary seaman, you are still, to a large extent, learning how to be a sailor. Yet, peculiarly enough, this is the time when you lay the groundwork for promotion to petty officer. In addition to being a working hand, a leading seaman must be able to take charge of a group of men just as a chief does; so the more quickly you become a leading seaman, the more quickly you are training yourself in that knowledge which a chief petty officer must have.

Now, what is that knowledge? For the time being, leave trade qualifications out of the picture. True, your trade qualifications are important, but for promotion in rank there are other important things. First of all, you must be able to "take charge". Taking charge is not a matter of shouting the loudest, nor is it a matter of slave driving. What it is, is knowing the job to be done, and seeing that the men you control do it quickly and efficiently. This is accomplished by giving the right job to the right person, and being constantly on the spot to see that the job is done correctly. There is seldom any need to be nasty so long as you make it quite clear what you expect of the men working for you. Above all, do not skylark when you are taking charge. This is the first sign that you lack confidence in yourself, and the men working for you will be the first people to notice it.

There is no doubt at all, that sometime during your service as an ordinary or able seaman you will be required to take charge of a group of men. If you do it as well as you can, your Chef petty officers and officers will come to have confidence in you, and you will be given more and more responsibility. Do not be shy when it comes to accepting responsibility. It is all very well to be "one of the boys", but it is foolish to be one of the boys to the extent that you ruin your career.

Having become a leading seaman, you now make ready to make the big step and become a petty officer second class. The people who become petty officers second class are the people who have done well as leading seamen. This is the big difference between the two ranks. You will see good and bad leading seaman in the service, but there can be no such thing as a bad petty officer. The reason is that a petty officer is given responsibility just because he is a petty officer whereas a leading seaman is given only as much responsibility as he shows himself capable of handling. In addition to the business of responsibility, a petty officer must set an example to all those below him in rank.

The petty officers and chief petty officers are the people about whom the whole Navy revolves. Officers know what needs to be done and order it to be done. Leading seaman ad below do as they are told, but chiefs and petty officers know the actual jobs and they are the people who are on the spot to see that jobs are done correctly and well. A ship without good petty officers is worse than no ship at all.

If you are a good petty officer second class, you will not be long in becoming a petty officer first class. Then comes the next big jump to chief petty officer second class. A chief petty officer differs from a petty officer in that officers and petty officers alike rely upon his vast experience as well as his abilities of leadership. A petty officer is gaining experience all the time, a chief petty officer generally has it. A chief petty officer may head the department in his particular trade, or he may be the second in charge of a department. A chief petty officer may be in command of a small vessel. For these reasons he must have organizing as well as supervising ability. The cream of chief petty officers second class become chief petty officers first class.

In the whole rank ladder there are certain general qualities which people at all stages must show. The first of these is initiative. According to the dictionary, initiative is "the readiness or ability to be the one to start a course of action". Applied to the Navy, this means that when you see that something needs doing, you go ahead and do it to the best of your ability without being ordered. A very simple example of initiative is this: one man when he is walking about a shore establishment sees an old cigarette package littering the ground. He walks straight past it "not his part of ship". Another man comes along, picks up the litter and deposits it in a gash can. The second man has used initiative. Another example could be that one man in a ship alongside sees the after breast rope chaffing badly on the fairlead. He glances at it and thinks, "It doesn't matter, the officer of the day will see it on his rounds." A second man examines the chaffing and realizes that the rope is about to part. He makes haste to inform the officer of the day. The second man has used initiative. Without initiative, you will never be more than a leading seaman, if that, no matter how good you are as a tradesman.

The second of these general qualities is dress and appearance. This was discussed in great detail in Chapter 12. However, it cannot be overstressed that the impression you make by your neatness and cleanliness of dress will have a direct influence on the reports and assessments made on you. The man who comes to divisions in tattered old working dress, and with a day's growth of beard on his face need not expect any mercy from his Divisional Officer when it comes time to assess **him for** the next rank.

The last quality to be discussed here will stand you in good stead in any walk of life. They are cheerfulness and a sense of humour.

Conditions at sea in wartime may be pretty rough. You may be worked very hard with very little sleep and you may also be seasick. At times like this unless you can remain cheerful and see the brighter side of things, you will literally break down under the stress. Remember this as well: your messmates have no choice but to live with you. But if you make yourself miserable and difficult to live with you are hurting yourself as much as you are hurting them.

The relation between rank and trade group

Obviously there cannot be a chief petty officer first class with trade group one. On the other hand, there is little use for an able seaman with trade group four. Therefore, trade and rank are connected in two ways.

1. There is a certain trade level you must reach before you can be promoted in rank.
2. There are certain ranks you must attain before you can advance in trade group.

   For the first connection, the rules are these:

   (a) To be an able seaman you must have trade group one.
   (b) To be a leading seaman you must have trade group two.
   (c) To be a petty officer you must have trade group three.
   (d) To be a chief petty officer you must have trade group four.

In the second connection, you must be a petty officer second class before you can qualify in trade group four.

Promotion in rank

Your promotion in rank depends on a number of factors. These are all listed in a book called the *Manual of Advance-*

ment and Promotion (BRCN 113**).** Your Divisional Officer has access to this book, and he will tell you any particulars you wish to know. However, the actual business of bow the Navy selects who is to be promoted next depends on a point system. Those men who are qualified enter the *zone for promotion* and those men in the zone who have the highest number of points are promoted.

First of all, then, you must qualify to enter the zone. You must complete a certain time in your present rank, a certain period of exemplary conduct and a certain amount of sea time. These time qualifications are laid down in the *Manual of Advancement and Promotion*. Also as you have seen, you must have achieved a certain trade group level. Finally, you may be required to pass a practical and/or written examination for each rank above that of able seaman.

Having qualified, you now enter the zone for promotion and begin to accumulate points. There are five ways of obtaining these points:

1. You will be assessed on a form CNS 4002, and the number of points you obtain will be determined by averaging your previous assessments. If you are doing a consistently good job, you can count on obtaining a good number of points. An illustration of one of these forms is shown in Figure 13-8. Assess yourself from time to time and just see how you stack up.
2. You will obtain some points for continuous RCN service. This is your bonus for staying in the Navy rather than trying civilian life between engagements.
3. You will gain some points for the time you spend in the zone for promotion. However, after a certain number of years, these points begin to subtract rather than add. The reason for this is to keep the way clear for younger talented men to get ahead.
4. You may obtain a certain number of points depending on how well you do in the written part of your rank examination. If you don't feel you did as well as you

could when you wrote this exam, you may rewrite it, but keep in mind that it is always the *last* exam you have written which counts.

5. You may obtain points for having completed educational courses on your own time. These may be either service courses or civilian ones if they are approved. However, only two courses count for each promotion, and they must not have been done on service time.

When you have entered the zone for promotion you will be given a *status card* every six months. This shows the points you have for the various factors. If you are not yet qualified you will be given a *qualifications card* every six months. This card shows what qualifications you have completed and those that you still require to enter the zone.

Elimination board

If you make a consistently low number of points on your CNS 4 0 0 0 , or if, for some reason, your number of points from good to bad, you will probably be required to appear before an elimination board. The object of this board to find out why your marks are or have become low. Having determined the reason, the board will attempt to remedy the faults. Appearing before an elimination board is not something be ashamed of. The most important thing for any man is find his proper rank and the proper rank is the one where he does a good job, performs well, and has the respect of his juniors, equals and superiors. If a man is promoted too fast, he may not be able to pull his weight and should perhaps go back to, his previous rank until he gains more experience. The elimination board will make these decisions.

Advancement in trade group

In most trades, trade group one is obtained through private study and on-the-job training. Men are required to pass a standard examination based on the actual work they have doing aboard ship.

Trade groups two, three and four may be obtained either

FRONT

O.N.	Rank Trade	Surname	Inits	Unit

REASON FOR REPORT: Half-Yearly [1] Draft [2] Change of DO [3]

PERIOD OF REPORT From____ To____

INSTRUCTIONS:

(Ref. BRCN 113(1) 8.14 "Performance Evaluation"). This form is to be completed initially by the man's immediate supervisor (P2 or above) who shall have observed the performance of the man for a minimum of 3 months. In a case where he has not, the next senior should complete it. It is then passed to the DO who reviews it with the Divisional PO or CPO, signs, passes it to Dept. Head and then the Commanding Officer. Finally the man is interviewed by the DO in the presence of his supervisor, informed of the evaluation and signs the form. THE FORM IS TO BE COMPLETED IN 1 COPY ONLY. COPIES ARE NOT TO BE RETAINED IN THE SHIP OR BY ANY PERSON. ALL FORMS ARE SCORED AT NAVAL HEADQUARTERS.

(1) Signature of Supervisor	Rank	O.N.	Day	Mo.	Yr.

(2) Signature of Divisional Officer	Rank	Number	Day	Mo.	Yr.

(3) Signature of Head of Department	Rank	Number	Day	Mo.	Yr.

This evaluation has been discussed with me by my Divisional Officer.

(5) Signature of Man being Evaluated	Rank	O.N.	Day	Mo.	Yr.

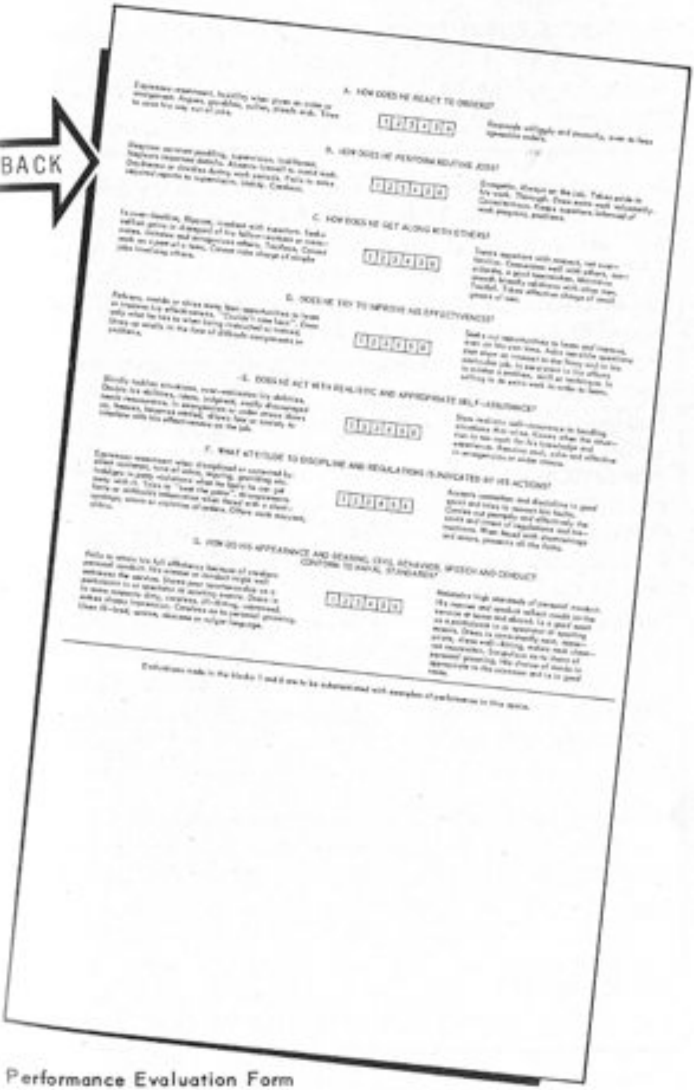
(4) Signature of Commanding Officer	Rank	Number	Day	Mo.	Yr.

For R.C.N. Depot Use Only

SEATIME: Not Qualified Qualified, date..............

Figure 13-8 CNS 4002

BACK



A. HOW DOES HE REACT TO ORDERS?

B. HOW DOES HE PERFORM ROUTINE JOBS?

C. HOW DOES HE GET ALONG WITH OTHERS?

D. DOES HE TRY TO IMPROVE HIS EFFECTIVENESS?

E. DOES HE ACT WITH REALISTIC AND APPROPRIATE SELF-ASSURANCE?

F. WHAT ATTITUDE TO DISCIPLINE AND REGULATIONS IS INDICATED BY HIS ACTIONS?

G. HOW DO HIS APPEARANCE AND BEARING, CIVIL BEHAVIOR, SPEECH AND CONDUCT CONFORM TO NAVAL STANDARDS?

Performance Evaluation Form

by taking a formal course or by private study. A man can qualify and be paid a higher trade group six months or more earlier by qualifying by selfstudy than by waiting for the formal course ashore.

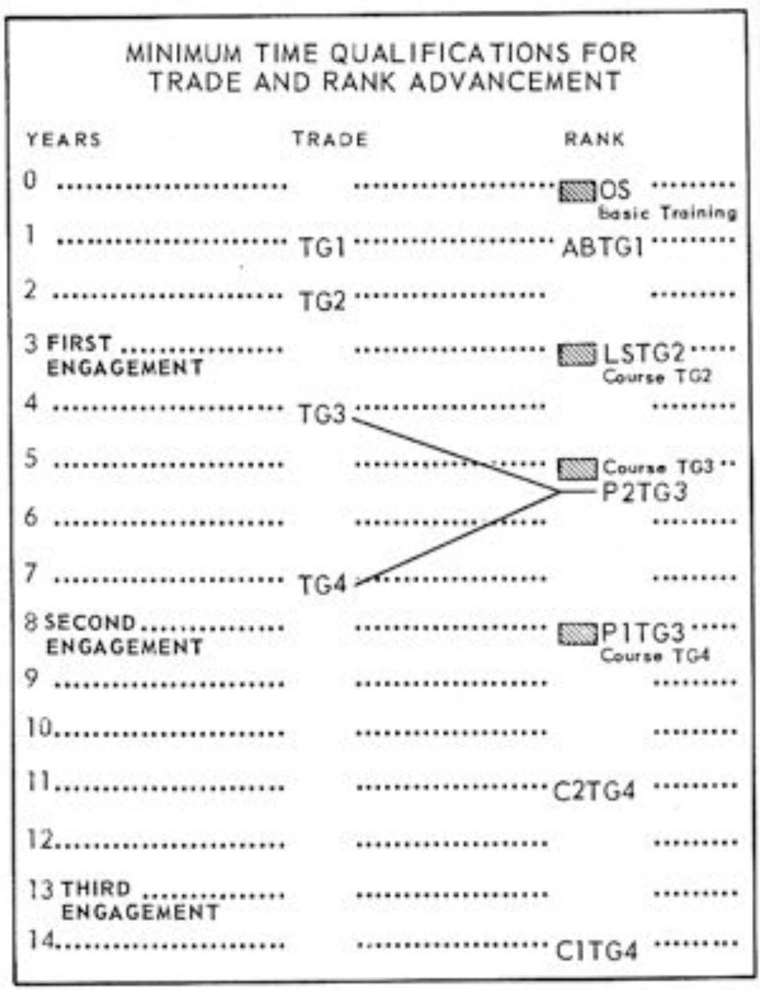


Figure 13-9 Minimum Time Qualifications for Trade and Rank

If he shows the ability and the energy, a man may advance to trade group four in any trade. However, it is not true to say that a man in one trade has the same opportunity as his contemporaries in every other trade to advance to the highest trade group. In fact, this cannot be the case. In industry, who gets paid more, the shop foreman, or the chief design engineer? Each does a similar job in that each is in charge of a group of specialists mechanists on the one hand, engineers on the other but obviously the chief design engineer is paid more. Why? Because his specialist talent is harder to find and therefore more valuable (in the same way as diamonds are more valuable than quartz). Yet, if the shop foreman were advanced to superintendent of shops, then his pay would be about that of the chief design engineer.

The lesson of this story is that every journeyman machinist, in advance to superintendent just as every designer can advance to chief engineer, but a greater proportion of designers are advanced than machinists. Similarly, in the Navy, a greater proportion of the more technical trades advance to trade group four than the non-technical trades. If you think this is unfair then ask yourself the question, “should a ditch digger of ten years seniority be paid the same as a machinist of ten years seniority?”. If your answer is “yes” it follows that your ambitions are not far above those of lifetime ditch digger.

There is one other point to remember. The Navy gives you a trade and generally this is the naval trade for which you are most suited. But these are not necessarily trades which you may practice in civilian life. You are given a trade which you can practice fully only in and for the benefit of the Navy. That is why the Navy pays you instead of you paying the navy. If you joined the Navy only to obtain a trade which you can practice in civilian life, then you are wasting your time and you had better not reengage at the end of your first three years.

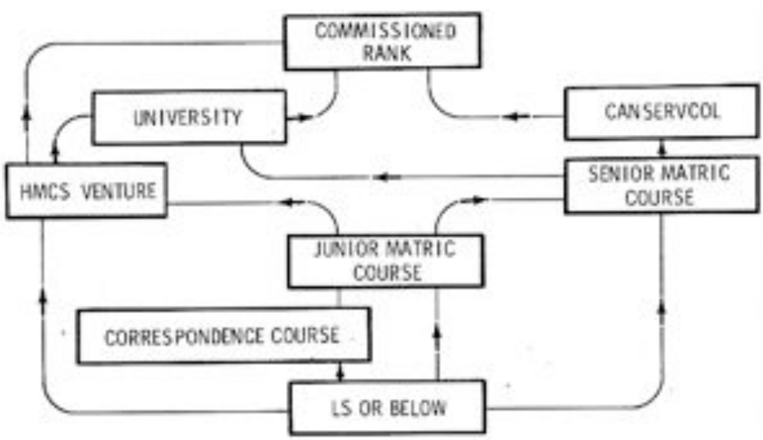
The system of engagements

There are very good reasons why a man's first engagement is only for three years. Three years is just enough time for a man to decide whether or not he likes the Navy. If he decides he doesn't like it, he is still young enough to try some other job. Three years is also just enough time for the Navy to decide whether a man is worth keeping. If not, he will not be permitted to reengage. So it is a *two-edged sword.*

If a man likes the Navy, and the Navy likes him, he may reengage for three more periods of five years each and one period of seven years. This makes a total of 25 years altogether, and makes a man eligible for a pension on completion. Details of the pension system will be given later in this Chapter.

The Avenues to Commissioned Rank

You have seen that the Navy in its rank structure tries to put each man into the niche best suited to him. In keeping with this principle, the Navy offers every man the opportunity



AVENUES TO COMMISSIONED RANK

Figure 13-10

to obtain a commission if he shows himself worthy of it. The golden rules you must follow if you wish to become an officer will stand you in good stead even if, for some reason, you do not make the step. They are:

1. Make yourself outstanding both in trade and in rank.
2. Obtain, in your own time, as many of the necessary educational requirements as you can.

The Navy wants to obtain its officers as young as possible, so new entry training is the best place to start your campaign.

There are four avenues to commissioned rank available. For the young man there is cadet training at HMCS VENTURE, cadet training at the Canadian Services Colleges, or a university course. For petty officers first class and above there is selection for branch officer.

The first three avenues have the same beginnings and will be discussed now. Branch officer entry is an entirely different case, and will not be discussed in this book.

VENTURE, Canadian Services Colleges, and University

The first qualification is successful completion of junior Matriculation. The *RCN Junior Matriculation Course* has been established to assist you in this. To get this course, you must be under 24 years of age at the beginning of the year in which you wish to do it, and you must be recommended by your captain.

There are also certain other requirements for the junior matriculation course. If you have grade XI in British Columbia or Ontario, or grade X in any other province, you are eligible to be selected without further study. If you have not reached these grades you must take a correspondence course in junior Matriculation Mathematics and Physics. This is done entirely through private study, so it is up to you whether or not you pass the RCN junior Matriculation examinations. Finally, you must be recommended by the Command Education Officer and the Personnel Selection Officer. These officers will interview you and give you various tests. There is nothing you can do to prepare for these tests and interviews

except to be sincere and keep doing your best in your jobs. Assuming you have completed all the qualifications, you may now be selected by a board in Naval Headquarters to attend the Junior Matriculation Course at HMCS NADEN. This is a course of six subjects: Mathematics, Physics, Chemistry, English, Social Studies, and French. On completion, you are required to sit the normal junior Matriculation examinations set by the British Columbia Department of Education.
Having passed these examinations with sufficient marks, or if you had junior matriculation when you entered the Navy, you may be selected to enter HMCS VENTURE as a cadet. If you do not go to VENTURE, you may be selected to take the RCN Senior Matriculation Course.

The Senior Matriculation Course consists of five subjects: English, Mathematics, Chemistry, Physics and a choice of French or German. Once again, you must pass the British Columbia Department of Education examinations in these subjects. Having passed these examinations, if you were under the age of 21 when you started the senior matriculation course, you may be selected to attend the Canadian Services Colleges or, if you were 25 or under when you started the course, you may be selected to attend a university of your choice. Both of these avenues are part of the *Regular Officers Training Plan* (ROTP).

HMCS VENTURE

The VENTURE plan is primarily for the training of future naval aircraft pilots. They are promoted to cadets on entry, and undergo a two year course in service and academic subjects. Upon graduation they begin flying training immediately, and, on reaching *Wings Standard*, are promoted to Sub Lieutenants (P). Graduates of VENTURE are given short service commissions for seven years. They may apply, and some will be accepted for permanent commissions. However, after the first year at VENTURE outstanding students may be selected for transfer to the Regular Officers Training Plan.

The Regular Officer Training Plan (RCTP)

This provides a four year course to cadets of all three leading to a university degree. Young men selected to train under the terms of the ROTP may be sent to universities of their choice or to one of the Canadian Services Colleges. In either case, the Navy is primarily interested in Engineering or Science degrees.

DOCUMENTATION

A number of records are kept on file for every man in the service. This is done so that an accurate account can be kept of all the qualifications, service time, recommendations etc. that a man may possess. You have seen the CNS 4000, let us now examine the other important documents in your file.

The fullest and most important of service documents is the *service certificate*. In short, this document keeps a record of your life in the RCN. You will be shown your service certificate once a year when the Captain makes his character and efficiency assessments on you. There are certain points you should check each time you see your service certificate.

On page one, check that your next of kin is correctly recorded. Also check that the date of your passing the swimming test is included.

On page two, you should check that the date of your joining the ship is correctly recorded.

On page three, make sure that all examinations, educational tests and qualifications are included.

On page four, you should note the Captain's assessment of you, and check the good conduct badge columns so that you know when the next one is due.

If there is anything you do not understand, ask your Divisional Officer or Chief Petty Officer.

TRUE COPY
OF THE
CERTIFICATE of the Service of

The corner of this Certificate is to be cut off if the man is discharged with a "Bad" character or with disgrace, or if specially directed by the Department of National Defence (Naval Service). If the corner is cut off, the fact is to be noted in the Ledger.

IN THE ROYAL CANADIAN NAVY

Official Number

Date of Birth

Where born { Province
Town or County

Trade brought up to

Religious denomination

Date passed swimming test

Man's signature on discharge to pension

Nearest known Relative or Friend
(To be noted in pencil)

Name: Mary BUCHANAN

Relationship: Mother

Address: Rural Route #1
Pugwash, N.S.

2 Mar. 58

All Engagements, including N.C.S., to be noted in these Columns

Date of actually volunteering	Commencement of time	Period volunteered for	Date of actually volunteering	Commencement of time	Period volunteered for
1.					
2.					
3.					
4.					

Medals, Clasps, Etc.

Date received or forfeited	Nature of Decoration	Date received or forfeited	Nature of Decoration

Description of Person	Stature Feet	Stature In.	Chest	Colour of Hair	Colour of Eyes	Colour of Complexion	Marks, Wounds and Scars
On entry as a boy							
On Advancement to man's rating or on entry under 28 years							
On re-entry for C.S. or for Non-C.S. after attaining 28 years							
Further Description if necessary							

C.N.S. 1049

CAUTION—This is an Official document. Any alteration made to it without proper authority will render the offender liable to severe penalties.

Figure 13-11A Service Certificate

Name James Stewart BUCHANAN

Ship's Name (Tenders to be inserted in Brackets)	Non-Sub. Rate	Rating	From	To	Cause of Discharge
Scotian		OSAWS	2 Mar. '58	2 Mar. '58	
Cornwallis		—"—	3 Mar. '58	28 July '58	
Hochelaga		—"—	29 July '58	15 Nov. '58	
Stadacona		—"—	16 Nov. '58	1 Mar. '59	
Stadacona		OSAW1	2 Mar. '59	1 June '59	
Stadacona		ABAW1	2 June '59		

Examinations passed and Notations or Qualifications other than those entered on History Sheets

Date	Particulars	Captain's Signature	Date	Particulars	Captain's Signature
6 June '57	Passed AE & English and arithmetic	L. G. Silver			
4 Oct '57	Qualified T.G.I.	G. Hawkins			
21 Jan '58	ABCD (A)	E. Jones			

Good Conduct Badges

Date	1st, 2nd 3rd	Granted, Deprived, Restored
9 Aug '50	1st	Awarded
21 Dec '51	1st	Deprived
21 June '52	1st	Restored
9 Aug '55	2nd	Awarded
Badges forfeited G.C.		

Character	Efficiency in rating, acting substantive rating in brackets	Whether R.M.Q. or not	Date	Captain's Signature
V.G.	Sat (OS)		31 Dec '50	E. L. Knox
Good	Mod. (AB)		31 Dec '51	W. A. Maclean
V.G.	Sat (AB)		31 Dec '52	L. C. Skinner
V.G.	Super (AB)		31 Dec '53	D. E. St. Laurent
V.G.	Sat. (LS)		19 Aug '55	T. B. Ward

Time forfeited

Date	R., D., C., C.P., W.T.	Number of days Awarded	Number of days Served
16 Aug '58	D	60	42
2 Feb '59	C.P.	7	7

Figure 13-11B Sections of the Service Certificate Important to You

Your service certificate is made of linen and is very carefully preserved. A copy of it is used for clerical work.

Conduct Sheet

This form gives details of the offenses which you commit (if you are caught) and punishments you receive. In addition to this, it records your assessments of character and efficiency. It also records the annual leave and traveling time you have taken.

Your conduct sheet follows you from shore establishment to shore establishment, but when you go to sea, the Navy feels it is only fair for you to have a clean slate to start with. Consequently, a new conduct sheet is started for every man when he goes to sea. The old sheet is kept on board until the end of the current year, and it is then sent to your port division manning depot for retention.

History Sheets

A history sheet is kept for each man in each trade. It records in detail all the examinations you have taken and all the qualifications you have. It also records just how good you are in your particular trade.

Divisional Record Sheet (CNS 264)

The divisional record sheet is normally just called a 264. It contains all the information your divisional officer may want to know about you. In addition to this, there are spaces where each of your divisional officers make informal summaries of just what they have thought of you. You will not normally have the opportunity of seeing your 264, although divisional officers will undoubtedly tell you if they have made adverse remarks.

Will

It costs a civilian a good deal of money to have a will drawn up. However, seamen may do it free on a form especially provided (CNS 545). This is every bit as valid as a civilian will so long as it is made out properly, and it is readable. On

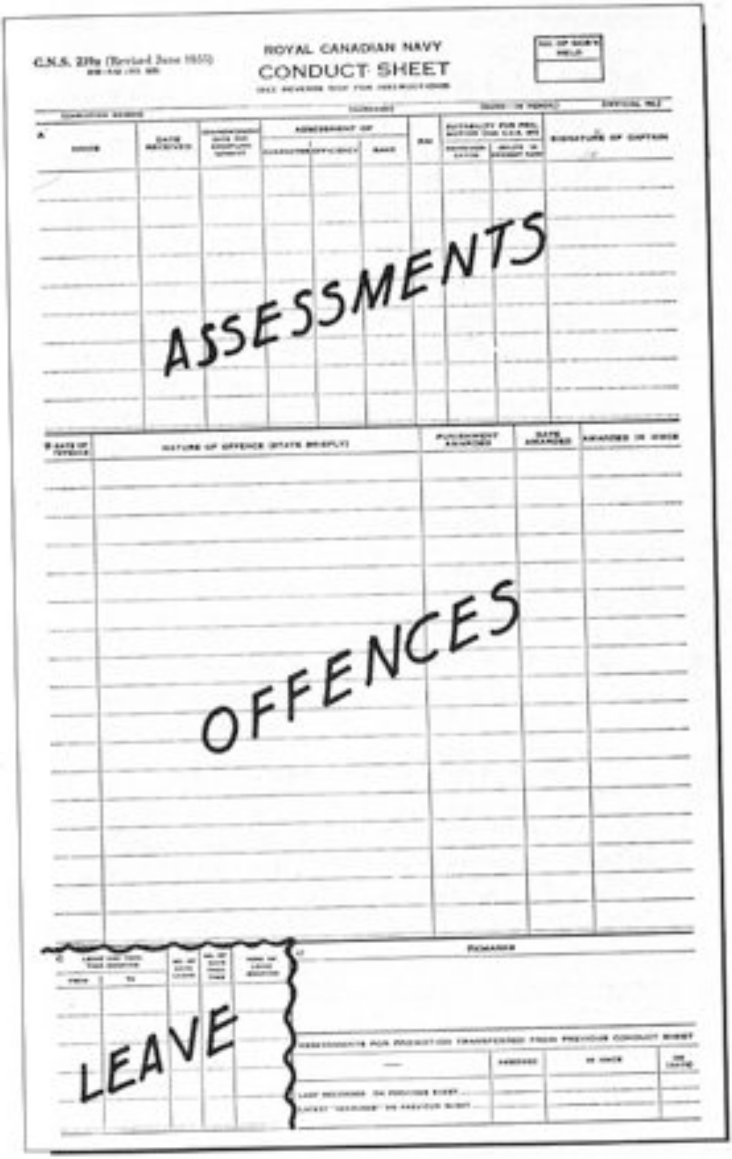
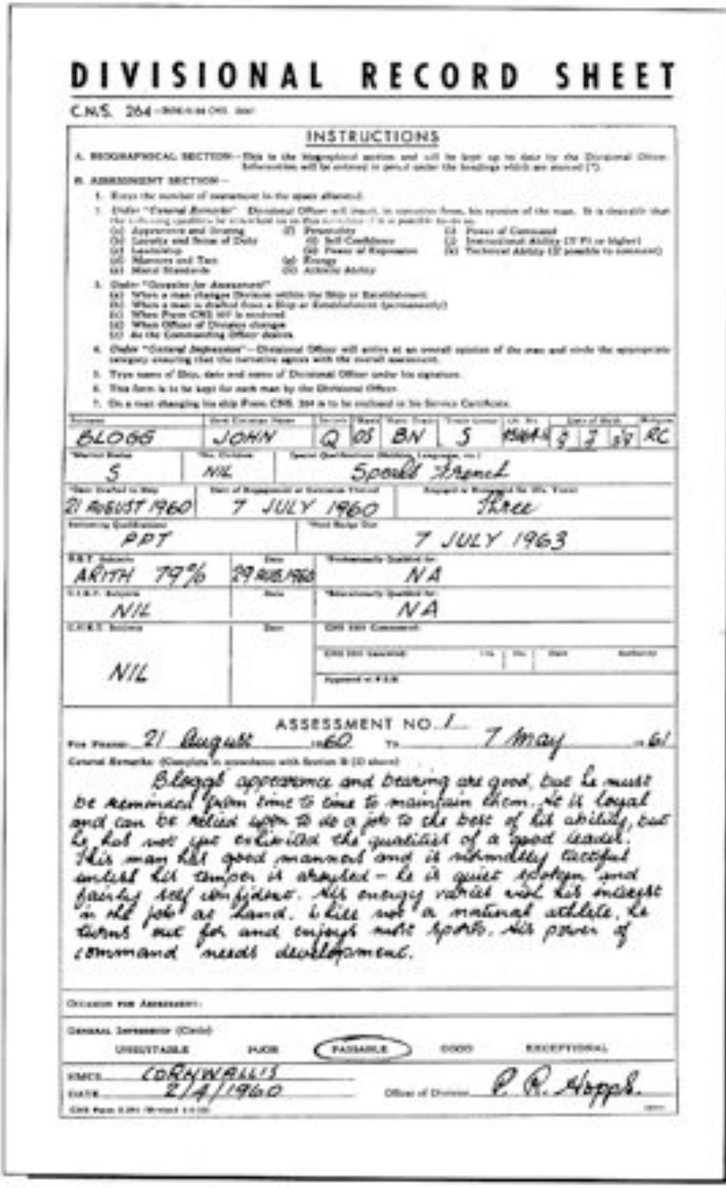


Figure 13-12 Conduct Sheet



DIVISIONAL RECORD SHEET

C.N.S. 264

INSTRUCTIONS

A. BIOGRAPHICAL SECTION

B. ASSESSMENT SECTION

BLOGG	JOHN	Q	05	BN	5	8564A	9 3 39	RC
S	NIL	Speaks French						
21 AUGUST 1960	7 JULY 1960	Three						
PPT	7 JULY 1963							
ARITH 79%	29 AUG 1960	NA						
NIL		NA						
NIL								

ASSESSMENT NO. 1

For Period 21 August 1960 To 7 May 1961

General Remarks:

Bloggs appearance and bearing are good, but he must be reminded from time to time to maintain them. He is loyal and can be relied upon to do a job to the best of his ability, but he has not yet exhibited the qualities of a good leader. This man has good manners and is normally tactful unless his temper is aroused – he is quiet spoken and fairly self confident. His energy varies with his interest in the job at hand. While not a natural athlete, he turns out for and enjoys most sports. His power of command needs development.

Occasion for Assessment:

General Impression (Circle)

UNSUITABLE POOR PASSABLE GOOD EXCEPTIONAL

HMCS CORNWALLIS
DATE 2/4/1960
Officer of Division P. R. Hopps

Figure 13-13 Divisional Record Sheet

the reverse side of the form are complete instructions on how to fill out your will. However, there are a few points to remember.

1. In most provinces of Canada it is necessary to make a new will if you get married. The old one becomes invalid.
2. Do not use any sort of paper clip or pin on your will.
3. Make sure that the executor of your will is a responsible person.

just think, this book may fall from your hands and you may fall down dead ten minutes after reading this sentence. Don't delay, make a will as soon as possible. Your Divisional Officer will get you the forms.

PAY AND ALLOWANCES

In the old days, payment was made at the end of each sea voyage, whether the voyage lasted six months or a year or more. Many sailors, on receipt of their pay, used to have an enormous party until all the money was gone, and then sign on a ship for another voyage. When asked how he spent his pay, one sailor was supposed to have answered, "I spent about a third of it on the girls, another third on beer, and the rest I spent foolishly!"

This carelessness about pay among seamen has carried on to this day, and it is quite unsensible. You are a pretty queer individual if you don't care how much pay you are getting. Furthermore, it is every man's own responsibility to see that he is neither overpaid nor underpaid.

Every man receives a *basic pay* for his rank and trade group. This basic pay increases every three years (up to nine years) which a man serves in any one rank. These three yearly raises are called *progressives*.

Every man receives a *kit upkeep allowance*. You have read about this in a previous chapter. Every man who is required to live outside a naval ship or establishment receives *subsistence allowance*. Married men over 21 who are living with their wives receive *marriage allowance*. If serving in a shore establishment they receive subsistence allowance, and if serving in a ship they receive separated family's allowance. Men serving in aircrew receive an additional allowance, as do those serving in submarines.

There are other allowances, but you will learn about these as you encounter the circumstances under which they are paid. Those listed above are the common ones.

Income tax and pension payments are deducted from your pay before you receive it. The same happens with fines and other deductions.

Assignments

Pay assignments are a convenience the Navy offers its members. You may order monthly payments to be made to banks, insurance companies, dependents, etc., and they will be automatically made and deducted from your pay before you receive it. A married man is requited to assign at least $60.00 a month to his wife or else his marriage allowance is stopped.

The maximum number of assignments you may make is four, and you may not normally change or stop an assignment any more often than every six months. If a man is absent without leave for over seven days, all assignments except that to his wife are stopped. After 21 days absence, his wife's assignment is stopped.

Pay Records

A complete record is kept of each man's pay for each six month period 1 Jan. to 30 June and I July to 31 Dec. If you want an accurate check of your pay, you will find it in your pay record. Also, if you have a query about your pay, your pay record will normally be used in explaining it.

Pay records are large sheets of paper full of confusing figures and symbols. Unless you know where to look, you will be lucky to find out anything about your pay. Figure 13-14 shows which spaces you should look at to find out what you want to know. Do not worry about the parts which aren't labelled. They are of no concern to you.

Basic pay and allowances are all listed separately. You must add them up to get your total pay. To find out what you should draw across the table, add up the assignment amounts,

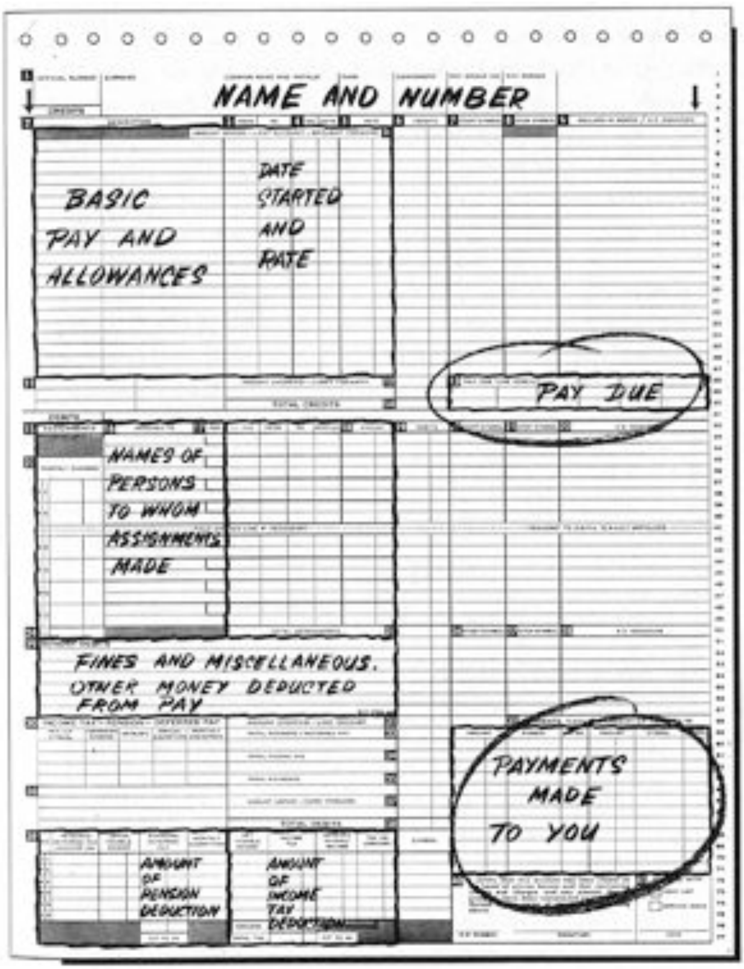


Figure 13-14 Pay Record

the pension deductions, and the tax deductions. Subtract this sum from your total pay and allowances. Divide by two because you are paid twice a month. This will give you your normal two-weekly pay except, of course, for fines and so on.

Service Insurance

Every person who has joined the Navy in or after 1955 is covered by insurance. In the event of the death of a petty officer or below this insurance pays $3,000. It costs a mere $1.20 per month. If you have at least five years of continuous service before you are discharged you may keep up this insurance in civilian life.

Superannuation and Pension

There are two types governed by two different Acts of Parliament. Toward one of these you contribute every month. The other is a gift of the government. In this book we shall call the first type contributory annuity and the second type noncontributory pension.


ROYAL CANADIAN NAVY
PAY RECEIPT
22222-E
SURNAME BLOGG
FIRST NAME AND INITIALS JOSEPH Z.
RANK OSSWS
RECEIVED FROM THE SUPPLY OFFICER THE SUM OF
TWENTY-FIVE DOLLARS $—25 00
J. Z. Blogg
DATE 12 JAN. 1965

Figure 13-15 Pay Receipt

Contributory Annuity

You do not receive an annuity if you leave the Navy before you have ten years service. If you should leave before that time, you will receive a refund of contributions you have paid or under certain conditions a lump sum called a cash termination allowance. After ten years you may receive an annuity on release, but a misconduct release will cause reduction or complete forfeiture of annuity. If you retire of your own accord before you have served 20 years you forfeit your rights for an annuity. In this case, you receive a return of contributions.

In all cases, the amount of termination allowance or annuity depends upon the number of years of service, and the reason for leaving the service. If you should die before you have ten years service your widow receives a termination allowance. If you die with more than ten years service, your widow and children get an annual allowance.

Noncontributory Pension

The object of this type of pension is to help you or your dependents in case you are disabled or killed on duty. It does not matter how long you have been in the service. Payment of this pension is not automatic but is dependent on the approval of the Canadian Pension Commission.

The amount of pension depends upon just how disabled you are periodic medical examination decides this. The pension is increased if you are married, and again according to the number of children you have.

If you should be killed on duty, a fixed pension is payable to your dependents

The paywriter in your ship or establishment will be glad to give you the details of both pay and allowances and pension and superannuation schemes if you approach him through the proper service channels. Some of the rules and regulations are complicated. It is recommended that you pass your RCN junior Matriculation Examinations in Mathematics before you attempt to compute annuities.

This section on pay, allowances and annuities has been very general and is only intended to give you a general idea of the subject. There are other books available that supply all the details and these should be referred to for exact information if you require it.

Quiz

1. What are the problems personnel structure in the Navy must surmount? Explain each of them.
2. What do you understand by initiative? Give an example from your own experience.
3. What are the personal qualities you must exhibit if you wish to become a chief petty officer? When should you start?
4. What are the various groups in the trade structure of the RCN?
5. Why do we use an initial 3 year engagement instead of 5 or 7 years?
6. Explain in detail the steps involved in achieving commissioned rank.
7. What facts are recorded on your conduct sheet?
8. What would you do if you thought you were being underpaid?
9. What types of insurance, superannuation and pension are available for naval personnel?

The answers to these questions may be found in Chapter 13. When you can answer all of these question perfectly, you may consider yourself to have a fair grasp of this chapter.

CHAPTER 14

ON BEING A SEAMAN

You will have realized by now that there is a great deal more involved in being a seaman than meets the eye. This book has dealt with the tangible things the shipboard work, the pay, the ships, the boats, the history but there is more to it than that. There is an intangible something which makes a seaman different from a landsman. Some people never get this something they have no place in the Navy...

Seamen have been described as many things. There was a day when they were considered the lowest of the low but, then, much more recently actors were considered very low, and look at their position in society today.

When he is at sea, a seaman lives in a world apart from his brothers ashore. The normal, humdrum life of the landsman doesn't affect him. Under the influences of the necessary cooperation of a ship's company, routine combined with "never-a-dull-moment" work, and the sea itself; he develops a different set of values from those of the carpenter, the bus driver, the business executive, etc. That this set of values is perfectly acceptable is due in great part to the character of the men who have gone to sea before: the Horatio Nelsons, the John Paul Jones's and all the "jolly-jack-tars" of bygone days. The character of the professional seaman is a heritage which has seen worse days, and, God willing, will see better.

Let us examine this heritage, to see better what sort of man this modern seaman is.

A seaman is a Godfearing man

This is a matter of logic. it is a known fact that God has done no seaman wrong. On the other hand, it is considered that He has done many seamen a great deal of good.

In the old days, going to sea was a hazardous adventure, Death from disease, shipwreck or a variety of other causes was a constant threat to every man in a ship. Seamen got. what security they could from superstition and religion. Often, in a hopeless moment, this security was a very real lifesaver. Since then, most of the hazard has disappeared (except in wartime); superstition has been put to ridicule; and religious belief has remained the one real security in the seaman's life. This is why we have prayers in the morning and divine service on Sunday, even if there is no Chaplain on board. A good seaman has a greater need for religion than a landsman, and what is more, he realizes it.

A seaman works hard and plays hard

This is the fact that is so often misinterpreted ashore, but it is true. The first part you will find out for yourself. The second part needs some explanation. Playing hard does not mean that when you go ashore you get blind drunk and sleep with any woman you can. A man who does that sort of thing is trying to escape from something, and the only escape a seaman tries to make is back to sea. Nor does it mean that you should be a teetotaler and shun women, unless, of course, you want to. But you should strike a happy medium.

After a month at sea living among men, following a routine, and working hard, the healthiest thing to do is get ashore and have a "whale of a time." And if you can't do that without becoming paralytic or picking up some dreaded disease, there is something wrong with you. Over the ages, good seamen have always known how to enjoy ‘themselves to the full and still keep out of trouble. To many people this is logical, but there are always some unfortunates who have to learn by experience.

A good seaman normally enjoys himself so much the first night or two ashore that he can’t wait to get back to sea!

A seaman is generous

For some reason, discipline puts a veneer of hardness on many seaman, although any bum on the streets of a port town will tell you that a seaman is generally good for a few pence even though it may be accompanied by a few well chosen harsh words. But a seaman’s generosity extends beyond dollars and cents.

Living in a ship where everyone depends upon everyone else to do his job well, helping a shipmate becomes second nature. The average seaman carries this trait ashore with him and is generous with everything from dogs and cats to men and little children. Many landsmen consider this trait of generosity foolhardy. Only a seaman knows its real value.

A seaman is reliable

This goes without explanation. If you are not reliable you will not be a seaman.

A seaman is smart in appearance and bearing

Unfortunately, this is not learned by experience. Have you wondered why there is so much parade training and so many inspections in new entry training? One reason is to make you smart in appearance and bearing. But why?

When you enter a good shop, why does a well-dressed sales attendant rush smartly up to you and ask if he can help you? It is to impress you. And why does he wish to impress you? Because by paying for his merchandise, you are helping to pay his salary. Therefore, he wants to show you that his is an efficiently run shop; in fact, the best shop in which to buy things. The people of Canada are your employers, and you have to impress them with how efficient the Navy is. Remember, it was not many years ago when these same people were not convinced that a navy was necessary at all. you know it is necessary, but you've got to convince them.

There is a further reason. When you are in a foreign port, your shoulder badges don't just say CANADA. Oh, no! To the people of that port they say: "Here is a Canadian sailor, and this must be what all Canadians are like." If you are smart, these same people will say to themselves: "These Canadians certainly have something on the ball!" If you are sloppy, they will say: "Canadians ugh! rubbish!" Don't laugh. just remember the last time you saw a foreigner walking down the streets of your home town.

A seaman is a healthy man

This is not quite true. A good seaman is a healthy man. The time may come and it may come suddenly when you will find yourself working day in and day out with very little rest. If you are not healthy, you will collapse.

You are taught in new entry training how to keep yourself healthy. Even at sea it is quite possible. A famous track and field coach once said: "I could train a long distance runner right here in my office so long as one of us didn't go crazy!" A seaman is not expected to be a distance runner, so he needn't go crazy, but he is expected to keep fit, and that requires a little effort. if you can remain as fit as you are on completion of new entry training, you will have no trouble.

In peacetime, the Navy is maintained, not for what it does, but for what it can do. Therefore, it is your duty to keep fit.

A seaman is a cheerful man

Have you ever met one of these people who are forever moaning: the food stinks; the pay is lousy, the Chief has a cruel streak; the officers are crumbs; and so on and on. Can you imagine being cooped up with him in, say, a submarine for three or four weeks? Now do you understand why sailors are cheerful?

Cheerfulness and a sense of humour go hand in hand. Together, they get the seaman over more bad patches than any other single trait. You may have to force it a little on the way from Commander's Defaulters, but try it it pays off.

A seaman is a highly trained man

In the official history of the RCN we read: "The importance of naval training can hardly be exaggerated.... Most people perform their occupational functions in the fullest sense almost every day; but the naval man ordinarily does so only a few times in his whole career, and for the rest he must practice and rehearse under conditions which at the best are thoroughly fictitious.... These are formidable conditions under which to prepare, and they emphasize the importance of conscientious training as well as of constant appraisal of existing doctrine."

APPENDIX 1

SOME READING MATTER FOR THE OFFWATCH HOURS

THE FAR DISTANT SHIPS by Joseph Schull

An exciting and easily readable account of the work done by Canadian warships in the Second World War. If you read no other book, read this one; you'll not regret it.

The Far Distant Ships is available in any service library, and maybe drawn from stores as BRCN 3470.

THE CRUEL SEA by Nicholas Monsarrat

This novel will give you some idea of the conditions at sea during the Second World War. It has also been made into an excellent movie.

The Cruel Sea is available in any library, and is published in an inexpensive edition by Pocket Books Inc., New York.

THE NAVAL SERVIE OF CANADA by Gerald N. Tucker

This is the official history of the RCN. It is published in two volumes, and is heavy going to read right through. However, it is an excellent reference book: if there is any particular thing you wish to know about the RCN, this book will have it.

The Naval Service of Canada is available in any service library, and may be drawn from stores as BRCN 3474 (l) and (2).

ONE OF OUR SUBMARINES by Edward Young

This novel gives a really authentic story of wartime submarine operations, It is available in most libraries, and may be bought very cheaply in any bookstore. It is published in an inexpensive edition by Penguin Books (Canada) Ltd.

COLONY TO NATION by Arthur R.M. Lower

If you are interested in Canadian history, this is the most readable book you will find on the subject. It covers the period from the first entry of Europeans into North America up to the Second World War.

Colony to Nation is available in most service libraries, and may be drawn from stores as BRCN 454.

THE ASHLEY BOOK OF KNOTS by Clifford W. Ashley

If rope fancywork interests you, this is the book to consult. It explains some 3900 knots from the simple overhand knot to Chinese priest cords.

This book is published by Faber and Faber, and is available in most public libraries.

A FEW NAVAL CUSTOMS, EXPRESSIONS, TRADITIONS, AND SUPERSTITIONS by W.N.P. Beckett

This is a small but extremely interesting little book. It is published by Gleves Ltd, and should be available in command libraries.

These are but a few of the many many books which may be had from a library for the asking. If you can, cultivate the habit of reading. There is no more rewarding way of spending off duty hours.

If you are already a detective, western or “skin book” fan, then you have the reading habit. Resolve to read one book about the navy or the sea for every five of your specialty. The story, say, of St. Laurent chasing a surfaced U-boat (Far Distant Ships) provides as much excitement as any adventure novel. The arguments in parliament when the RCN was about to be born (Naval Service of Canada) provide as much intrigue as most “foreign agent” type novels. And the stories of convoy escort work (The Cruel Sea) will provide as much blood and thunder as the best of westerns.

Remember, one day what you do may be the subject of some very interesting book which your grandchildren will be encouraged to read.

APPENDIX 2

GLOSSARY

The following are a few of the more common terms used by seamen. Some are slang terms, and some are good seaman-like terminology. The slang terms are printed in italics; they should not be used except in informal conversation.

ABAFT: further aft than. Never use the term "aft of."

AFT: in the direction of the stern.

ALL STANDING: to bring something up "all standing" means to bring it to a sudden or unexpected halt.

ALMANAC: a nautical almanac is a navigational publication which predicts the movement of heavenly bodies.

"A's" and "A's": alterations and additions. When a ship goes into refit it submits a list of the "A's" and "A's" it requires to be done.

ATHWART: running from side to side. (See Chapter 5)

AWASH: level with the surface of the sea. (Example: a ship sinking in the upright position will eventually have its decks awash.)

BARRACK STANCHION: someone who has served for a long time ashore in barracks or establishment.

BARGE: a flag officer's boat.

BATTEN DOWN: to shut weather deck openings in the whole or part of a ship.

BEACH (ON THE BEACH): shore or ashore.

BEAM ENDS: when a ship is completely on its side. A person is at "beam ends" when he is confused.

BEAR A HAND: an order meaning to act quickly or smartly.

BELAY: to make fast a rope end. "Belay" also means to cancel an order. (Example: "Hands muster on the forecastle; belay that, hands muster on the quarterdeck.")

BELOW THERE: a seaman's way of attracting attention of a person below.

BERTH: the correct place for a man or a ship. "To give a wide berth" means to keep well clear or to avoid something. (Example: new entries give the Commander's table a wide berth.)

BETWEEN DECKS ('TWEEN DECKS): any space below the upper deck.

BILGE: nonsense. (Example: his story is bilge.)

BOARD: the old name for the side of a ship. "To board a ship" means to come alongside it; "to board and enter" means to come alongside and (forcibly) enter. "To go aboard" means to enter a ship over the side. "Inboard" means inside a ship; "Outboard", outside a ship.

BOOT TOPPING: a band of paint at the waterline between the bottom and ship-side paints. It is of a special type to prevent the growth of minute marine organisms.

BRICK: a shell or projectile.

BRIGHT WORK: polished metal fittings.

BROACH TO: to unintentionally slew around broadside to a wave.

BROW: a gangway between two ships, or from ship to jetty.

BUM BOAT: a civilian boat which comes alongside a warship to sell merchandise.

BUNTS OR BUNTING TOSSER: slang name for a signalman.

BUTT END: the largest end.

BUZZ: a rumour. A “hot buzz” is a recent or well authenticated rumour.

CANT: to incline away from the upright position.

CAPSIZE: to overturn.

CHIPPY: a hull mechanic or carpenter.

CHOCKABLOCK: Full up.

CLEAN: to change rigs into one denoted by a smaller number. (Example: one cleans into number two’s from number five’s. However, one “shifts” from number two’s into number five’s.)

CLEAR: free, unobstructed, or to make free. (Example: if a luff has been choked and you wish it to run, you clear the luff.)

COCK BILL (A’ COCK BILL): an anchor is said to be a’ cock bill when it is clear of the hawse pipe and ready to let go.

COME UP: an order to slack off on a rope. Also, to “come up with” another ship means to catch up with it.

COMPLAIN: a block complains when its sheave squeaks in turning.

CRACK ON: to increase speed.

CROW’S NEST: a small shelter for a masthead lookout.

CRUSHER: a member of the boatswain trade when employed in regulating duties.

CUT OF HIS JIB: appearance of a person or ship. (Example: “I don’t like the cut of his jib.)

DAVEY JOYES’ LOCKER: the bottom of the sea. This is where wrecked ships and drowned sailors end up.

DEAD MARINE: an empty bottle, so called because “it has done its duty and is ready to do it again”. This is also called a “dead Indian”.

DEAD MEN: rope ends hanging from aloft.

DERELICT: a ship, abandoned by her crew, but still afloat.

DEVIL: in wooden ships this is a large seam near the gunwale; hence the expression “between the devil and the deep sea”.

DIP: to lower temporarily. The ensign is dipped; a man is said to be dipped if he is disrated.

DITCH: to throw overboard.

DOGGIE: a midshipman detailed off to attend a senior officer. (Example: “Captain’s doggie”)

DONKEY: the name given to any small engine used as a labour saving device. In a small ship the main diesel engines are sometimes called “donks”.

DOWSE: to lower or slacken suddenly, or to put out a light.

DRAG: to pull a device along the seabed for the purpose of recovering something. (Example: when somebody is drowned the area is dragged for his body.)

DRIP: to complain or moan.

DROWN: to drench or saturate. (Example: grog is drowned when too much water is put into it.)

DUFF: dessert or pudding. Or when a piece of equipment becomes unserviceable it is said to have gone duff.

EASY: an order meaning to carry on what you are doing more carefully or slowly.

END FOR END: in exactly the reverse position.

FAIR: favourable or unobstructed. (Example: a fair wind or a fair lead.)

FAKE: a coil in coiled rope.

FANNY: a locker or tin for storing mess utensils. It used to be a tin for storing tea and sugar. (The derivation of this word is rather typical of a sailor’s sense of humour. The time of the introduction of tinned meat in the Royal Navy coincided with the murder and dismemberment of a child called Fanny Adams. The tinned meat was not at all popular and was jokingly compared with parts of poor Fanny Adams. However, the tins were useful as stowage containers and the term “Fanny” stuck.)

FIDDLE: battens fitted over a mess table to keep mess utensils in place in bad weather.

FIT OUT: to rig or provide a ship, person, or thing with its full outfit of stores and equipment.

FLEET: a general term meaning the ships of the RCN. (Example: when a man completes new entry training he goes to the fleet for on-the-job training.)

FLOTSAM: any floating cargo, stores or equipment which have floated off a wrecked or damaged vessel. jetsam is cargo, stores or gear deliberately thrown over the side to lighten a ship.

FORE AND AFT RIG: a slang term meaning Class II uniform.

FOUL: to entangle or obstruct. (Example: her anchor was fouled with underwater cable.)

FOUNDER: to sink.

FRESHEN THE NIP: to shift the point where the bight of a strained rope makes contact with a fairlead or other object. This is done by heaving in or slackening a few inches.

GALLEY: the ship's kitchen.

GANGWAY: any recognized entrance to, passageway, or traffic route within a ship. Do not confuse a brow with a gangway ashore.

GASH: garbage or leftovers; extra. (Example: "I have two gash collars in my kit.")

GLIM: a light.

GOB: slang name applied to men of the U.S. Navy.

GREEN SEA: an unbroken wave. A ship is said to be "shipping it green" when unbroken water is coming aboard.

GROG: one part rum to two parts water; this is the regulation issue to leading seamen and below.

GROG-BLOSSOM: a red nose or pimple.

HANGING JUDAS: a fall, whip, or halyard which is hanging loose from aloft.

HARD TACK: ship's biscuit.

HEADS: toilets

HEATH ROBINSON: makeshift.

HOLIDAY: a gap. (Example: a spot missed while painting, or a gap in a row of drying clothes.)

HULK: a vessel in use but condemned for sea service.

IRISH PENNANTS, rope yarns or stray rope ends hanging in the rigging.

JETSAM: (see flotsam)

JETTISON: to cast overboard.

JIMMY: the First Lieutenant.

JONAH: a bringer of bad luck.

JOSS. Luck.

JUNK: old rope.

JURY: temporary; normally and emergency measure. (Example: jury rudder; jury mast.)

Ki: hot cocoa.

KILLICK: slang for leading seaman. (In fact, a killick is a small anchor.)

LABOUR: a ship labours when she pitches and rolls heavily.

LANDFALL: first sight of land after a sea passage.

LAY UP: take a ship out of service.

LEE: opposite side to that upon which the wind is blowing.

LIE TO: to lie as stationary as possible in a gale with the wind and sea ahead.

LONG IN THE TOOTH: old in the service, or senior in rank.

MASTER: captain of a merchant vessel.

MATELOT: slang for a sailor (French)

MATIE: dockyard worker.

MESS TRAPS: officers' food utensils.

MESS UTENSILS: men's food utensils.

MUNDUNGUS: rubbish.

NEATERS: neat rum.

NOONERS: Lunchtime spirit issue.

NOR’EASTER: not entitled.

NUMBER ONE: the first lieutenant.

OPPO: opposite number; a man with a similar job except in another ship or another watch. Also, a friend.

OVERHAUL: to overtake; to examine and repair; to haul apart the blocks of a tackle.

PASS THE WORD: to relay an order or message. (Example: pass the word to Ordinary Seaman Bloggins to report to the First Lieutenant.

PAY AWAY: to slacken on a rope.

PERKS: perquisites; the special advantages of a special job.

PIER HEAD JUMP: joining a ship or coming off leave just as ship is about to sail.

PIGEON: a man of the Royal Canadian Air Force.

PIPE DOWN: Literally, after this order a boatswain’s call is not used again until call the hands. Generally, it is an order meaning keep silence.

PLUSHERS: the leftover after grog has been issued.

PLUMBER: slang name for a man of the engineering trade.

POKEY: cells.

PONGO: a soldier.

PORT: a square or rectangular hole in a ship’s side.

PROUD: sticking out.

PUSSER: the Supply Officer. Anything which is issued by the service is called “pussers”. (Example: pussers knife; pussers sausages.)

QUEEN’S HARD BARGAIN: a loafer; and incompetent man.

RABBIT: crown property taken or converted for private use. RAKE: to lean or incline from the upright.

RANGE: to lay out (rope or cable).

RATTLE: trouble. To be in the rattle is to be in trouble.

REFIT: to repair or rejuvenate.

ROGUE'S SALUTE: a single gun fired at colours on the day of a court martial.

ROUND UP: to overhaul or haul up a tackle to a convenient size for stowing.

RUN: a man is marked "run" if he is absent without leave for over seven days. Run may also mean the distance travelled by a ship in a certain length of time.

RUN DOWN: to ram, either on purpose or by accident.

RUNNERS: smugglers.

SCHOOLY: instructor officer.

SCOTCHMAN: any piece of metal, wood, canvas, or other material used to prevent chafe.

SCRAN: Food. Scran-up means dinner is served.

SCRAN LOCKER: Stowage place for personal gear found sculling. Owner usually has to pay a forfeit to reclaim. Originally forfeit was a piece of soap.

SCULL: to shirk work, loaf. Anything left sculling is left unattended in a place where it shouldn't be.

SCUTTLE: a round port.

SEA LAWYER. an argumentative man. One who uses naval regulations as an excuse for lack of initiative.

SEA LEGS: the ability to maintain balance when a ship is rolling.

SHIP'S COMP.KNY: all personnel of a warship.

SHIVER: to shatter. "Shiver my timbers" is a rather hackneyed seamen's expression.

SHIPSHAPE: seamanlike:

SIN BOATSWAIN. chaplain.

SISTER SHIPS: ships of the same class.

SKATE: a no good, ne'er do well.

SKIPPER: master of a small merchant vessel.

SLOPS: clothing stores, or the clothing therein.

SNOWBALL SAILOR: one who joins the navy during the cold winter and becomes dissatisfied when the sun begins to shine.

SNUG: properly secured.

SPEAK: to communicate at sea by visual signaling with another ship or shore signal station. (Example: an entry in the ship's log might read "Spoke S.S. Princess Helene."

SPELL: period of time. For example a spell at the wheel.

SPRINDRIFT: spray blown from the crests of waves.

SPITKID: a receptacle placed on deck for cigarette butts, waste paper, etc.

SPURN-WATER: a low wooden or metal coaming around the outboard edge of decks to prevent washing down water from spilling over the ship's side.

SQUARE RIG: slang term for Class I uniform.

SQUARE YARDS: to agree. (Example: "I have squared yards with my oppo about watches.")

STANCHION: a supporting post. (Example: guard rail stanchion.)

STAVE: to break or make a hole in. (Example: "yesterday my ship stove in the jetty.")

STEVEDORE: a man employed to stow cargo in a ship.

STRIKE: to haul down. The white ensign is never struck.

SULLAGE: wet garbage or rubbish.

SWEAT UP to give an extra hard pull on a rope, thereby taking down all slack.

SWEEPER: man responsible for the cleanliness of a particular area. (Example. messdeck sweeper; coxswain's office sweeper.)

SWING THE LEAD: to avoid work.

TAKE CHARGE get out of control. A rope has taken charge when you can no longer hang onto it.

TANKY: navigating officer's assistant.

TELL OFF: detail for work.

TIDDLEY: neat; smart.

TIFFY: short for artificer. Medical assistants used to b, called artificers, and the name has stuck ...they are called tiffies.

TIGHT: watertight.

TOOTHY: dentist; (sometimes called a toothwright).

TOT: ration of rum.

TRICK: a short spell of duty in a particular job. As watch on deck you may do a trick at the wheel and a trick a a lookout.

TWO BLOCKS: when the blocks of a tackle meet.

UCKERS: a game similar to Ludo which is a favourite among sailors.

ULLAGE: the amount a tank, cask, or other receptacle i short of being full.

WET: stupid. Wet as a scrubber: very stupid.

WARM the bell: to be early.

WEEP: to leak slightly.

WORK UP: to exercise the office,s and men of a ship newly commissioned.

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