Search for The Titanic

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SEARCH FOR THE TITANIC player's guide printed 03/14/89

Foreword

by Dr. Robert D. Ballard

AS **LONG** AS I can remember, I've been fascinated by the sea. During my youth I spent countless hours exploring the seashore, collecting shells and driftwood, and watching with amazement the marine creatures that lived in tidal pools. Throughout my teenage years, I took up scuba diving and began to explore deeper and deeper into the undersea world. The deeper I ventured the more I became aware of the many "secrets" hidden beneath the waves. When I wasn't at the seashore I spent night after night reading about Captain Nemo and his adventures and his legendary submarine Nautilus in Jules Verne's 20,000 Leagues Under the Sea. Finding the Titanic was a great challenge to those interested in the sea, and a mountain that I had to climb.

Throughout my career I've studied the sea. I did post-graduate work at the University of Hawaii in marine geology, I worked as a porpoise trainer to pay for my education, and I later served my country in the United States Navy. I am now at the Woods Hole Oceanographic Institution as Director of the Deep Submergence Laboratory and Director of the Center for Marine Exploration.

It is always startling to think that we know more about the land forms on the dark side of the moon than we do about what lies beneath our own oceans. In fact, man visited the moon several years before he visited the Mid-Oceanic Ridge Crest, a 40,000-mile-long undersea mountain chain that encircles the entire globe. The Mid-Ocean ridge system is dotted with mountains higher than the Alps, and cut by hundreds of valleys that are wider and deeper than the Grand Canyon.

We are just beginning to explore the undersea world. In fact, we are really still in the Lewis and Clark stages. Every venture into the unknown undersea world yields new information about the planet on which we live. Not long ago we didn't even know the average depths of our oceans, but today we are realizing that the oceans are the lifeblood of the planet. The fragility of the Earth's life-support mechanisms demands that we learn more and more about the sea.

Finding the Titanic was a great challenge. A much greater challenge is stimulating people towards an appreciation of the sciences and technologies that made the discovery possible. I trust that those of you captured by the lure of the sea will find this game challenging. I hope that those of you not yet captured will find the thrill of exploration irresistible.

Good hunting!
Ron BALLARD

The quest of the century

SHE WAS THE largest moving object ever built by man. The RMS Titanic weighed in at 46,000 tons, and standing upright on its stern the vessel was taller than New York's Woolworth Building, the highest skyscraper of the time. It contained the biggest and best of everything money could buy.

Captain E.J. Smith, a senior officer of the White Star Line with impeccable credentials, was chosen to command the Titanic during her maiden voyage from Southampton, England to New York and back again. On April 10,1912, the vessel left the port of Southampton. After making brief stops for passengers and mail (in Cherbourg, France and Queenstown, Ireland), the Titanic began its journey to the United States. Crossing the ocean was scheduled to take seven days. Capt. Smith had chosen to follow the Great Circle Route, a northern course that would get him to New York in record time.

The first four days of the trip were uneventful. First class passengers worked out at the gym, ate at the French sidewalk cafe, and rubbed elbows with the cream of society. Other passengers were isolated from the first class section of the ship.

On April 14, at about 20 minutes before midnight, the Titanic experienced a sudden jolt. By midnight, Capt. Smith knew the terrible truth: the unsinkable vessel had suffered a deadly impact against an iceberg. The iceberg, acting like a giant can opener, cut a 300-foot gash through five watertight compartments on the vessel. Three hours later, the Titanic quietly slipped beneath the waves, descending more than 13,000 feet to her final resting place. In the end, only 705 of the 2,207 people on board survived. No one believed the majestic liner would ever be seen again.

Three quarters of a century passed before the Titanic again became front-page news. On September 1, 1985, a joint French-American expedition, led by Dr. Robert Ballard, discovered the remains of the great ship. Using the research vessel Knorr as a base of operations, the team spent a number of days photographing every inch of the wreck site. They photographed the giant ship, as it sits today in two pieces on the ocean floor, as well as numerous mementos of the past scattered throughout the wreck site: bed springs, corked wine bottles, silver serving trays, dishes and other objects too numerous to mention.

NOW it is your turn. Succeed in outfitting an expedition and locating the famous shipwreck, and you too can see some of the images Dr. Ballard and his team saw of the vessel after her long repose. Good luck in your SEARCH FOR THE TITANIC.

Excerpted from 'Titanic: The Quest of the Century by John Jermaine; Commodore Magazine, April 1989. Used with permission.

1 Putting together your expedition

Game overview

SEARCH FOR THE TITANIC is a computer game designed to simulate the frustrations and triumphs of searching for underwater wrecks. As in most things in real life, mostly there are frustrations . . . .

SEARCH FOR THE TITANIC is essentially two games in one. The first game, Phase 1, challenges you to appropriately manage your resources to plan a successful expedition. The second game, Phase II, challenges you to use the equipment, supplies and people you selected to search for and explore an underwater shipwreck.

What goes on in Phase I

You must choose which ship you want to use, from four types available, and what equipment you wish to place on it. You must choose each person for your staff from lists of job applicants. You must accurately forecast how long you will spend at sea, so you can accurately purchase food and fresh water. You must know how far the wreck is from port, as you must not buy too much or too little fuel.

And, worst of all, you must get the money to fund the expedition. In SEARCH FORTHETITANIC, you must beg, wheedle, grovel and cajole (just like real life) for grant money. Grant money is provided by various corporations for various reasons, like publicity or research. To even have a chance of getting any money, you must choose the right reason and go to the right organization – with enough of a reputation to convince them you will actually do what you said you would do. If it all works out, you will get some money.

What goes on in Phase II

You must navigate your ship from port to the search area, using up to 100 different maps. You have to keep continuous track of the constantly changing weather; a sudden storm can easily damage your expensive equipment.

Once you reach the search site, you must deploy whatever wreck detection devices you have and spend the long hours finding a wreck. You will not always find it the first time out, and will often have to return to port to re-provision.

Once you find it (if you find it), you must manage your divers effectively, so you don't waste time and money. Then, if all goes well, you will have found and dived on one wreck. There will be a few more to go.

Starting the game

Refer to your user's manual for information on loading and running the program. Then, after you have pressed the space bar to go past the title screen, you may choose to load a previously saved game, or start a new game. The first time you play the game, trying to load a saved game will not work. Select "Start a new game." You may choose to play the complete game, or to only SEARCH FOR THE TITANIC.

Operational notes

References are made throughout thisguide to the ENTER, ESC, CTRL and ALT keys. Not all computers have these keys. Please refer to Appendix A in this guide, and to the SEARCH FOR THE TITANIC user's manual included with the game, for details on which keys to press on your particular machine.

Searching for the Titanic

You will most likely wish to SEARCH FOR THE TITANIC the first time out. When you choose this **option,** you start the game with a lot of money. The drawback here is that you can't find any wreck other than the Titanic.

The other menu option, "Start a new Game," is the way you should start the game when you want to play it for real. Nolc that you can't cheat and find the Titanic the easy way, then go to the full game and have a record of where it is. The SEARCH FOR THE TITANIC program randomizes the locations of the wrecks whenever you restart the game.

After you decide where you want to start, you need to enter a name. Just type the name by which you'd like to be referred and press the ENTER (or RETURN) key.

Now you are at the beginning, on the Main Menu, in Phase I.

Starting at the beginning

When you start at the beginning, you start in Miami, Florida with $10,000 in cash, no employees, no equipment, no ship, no expedition plan, and no reputation. In this game, your score is your reputation. To obtain the funding you need to find the Titanic, you must first build a reputation as a successful ship finder and researcher. You start the game with just $10,000, barely enough to rent a boat and hire some divers. If you plan your exploration carefully, you will be able to find a wreck and dive on it.

You earn reputation for both finding a wreck and exploring it. The more thoroughly you search a wreck, the more reputation you will earn. It is estimated that you will have to dive about 10 wrecks to have enough of a reputation to get sufficient financing for the Titanic search.

Ports, ships, and equipment

The ships

There are four ship designs modeled in the game. From smallest to largest, they are the Moyu, the Apprentice, the Kingfisher and the Voyager. In SEARCH FOR THE TITANIC, these ships differ in many ways. You will start out using the Moyu, mainly because it is the least expensive ship.

Below are descriptions of the four ship designs. Note that where prices are listed they are "suggested," or "base" prices. Many factors contribute to the actual price of a ship when you rent or buy; among these are where you buy, the condition of the ship, and how desperate you are to have it. Refer to the table at the end of this section for quick reference information about all four ships.

The Moyu

The Moyu is the smallest of all the ships in the game. Just looking at it, you might be tempted to call it a boat. As you first start out the game, you will be using the Moyu almost exclusively (for price reasons).

Price (new):	$50,000
Daily rental:	$250
Maximum load:	5,000 kg
Fuel (per hour):	5 gal
Maintenance crew:	1 person
Maximum crew:	13 berths

The Moyu, being the smallest ship, has limited weight capacity and deck arca, so you will not be able to use the sonar/camera platform, the minisub, or the bathysphere. Because of the limited space for staff, the limited range, and the lack of mounting brackets for the deep sonar, the Moyu is at its best as a shallow waters coastal exploration ship.

The Apprentice

The Apprentice is aptly named. If you are using this ship for the first time, you probably have made a few successful dives and arc feeling pretty good about your abilities. Still a small ship, as ships go, the Apprentice cannot use the sonar/camera platform, the bathysphere, nor the minisub.

Price (new):	$100,000
Daily rental:	$500
Maximum load:	12,000 kg
Fuel (per hour):	10 gal
Maintenance crew:	3 people.
Maximum crew:	22 berths,

The Apprentice can easily be outfitted for a good Spanish Armada wreck-site expedition. Moving up from the Moyu, you gain the use'of the deep sonar, enjoy a much greater range at sea, and have the freedom of carrying *more* divers.

The Apprentice is a larger ship than the Moyu, but the same "killer dwarf" mentality is as evident in the design as it is in the smaller Moyu.

The Kingfisher

Once you move up to the Kingfisher, you're talking performance. In the animal kingdom, the kingfisher is a bird that dives for fish that often are more than 10 feet below the surface of the water. This ship is smaller than the behemoth Voyager, and larger than the Apprentice. The Kingfisher is a more complex ship to run than the Moyu and Apprentice, so there are many more support staff.

Price (new):	$200,000
Daily rental:	$1,000
Maximum load:	20,000 kg
Fuel (per hour):	20 gal
Maintenance crew:	8 peopte
Maximum crew:	35 berths

When you use the Kingfisher, you may outfit it with both the sonar/camera platform and the bathysphere – that is how the Kingfisher earns its name. Using both the sonar/camera platform and the bathysphere, you can search and dive to depths far out of the range of both the Moyu and Apprcnticc. Only the Voyager, with the ability to use the minisub, can dive decpcr.

The Kingfisher is an ideal ship for exploring just about anywhere an unprotected diver can descend. It has a good range, and a fairly good load capacity.

The Voyager

Price (new):	**$600,000**
Daily rental:	**$300**
Maximum load:	50,000 kg
Fuel (per hour):	40 gal
Maintenance crew:	15 people
Maximum crew:	**55 berths**

The Voyager was named after the deep-space probe launched in 1976 to explore the outer reaches of our solar system. With the Voyager ship you can probe distances and depths not possible with the other ships. The only ship in SEARCH FOR THETITANIC that is able to use the minisub, the Voyager can send divers to 15,000 feet below the surface of the ocean.

This is the ship you will use for finding and exploring the Titanic, which was located at about 12,500 feet (over two miles) underwater. This ship is incredibly expensive to buy or rent, more expensive yet to properly crew, and astronomically expensive to actually move. However, it is the best of the best.

Just to shock you, a full-blown Voyager expedition will cost about $8,000 a day to operate, and that does not include the fuel cost. The Voyager consumes far more diesel than the other three ships.

Table 1-1 Details of the four ships

Name	Price ($)	Rent/ day ($)	Berths Swabs required Max load (kg)	Fuel (gph)		
Moyu	50,000	250	5,000	5	1	13
Apprentice	100,000	500	12,000	10	3	22
Kingfisher	200,000	1000	20,000	20	8	35
Voyager	600,000	3000	50,000	40	15	55

Table 1-2 Ports simulated in SEARCH FOR THE TITANIC, with technical levels for each

Caribbean

San Juan	Puerto Rico	7
Port of Soain	Trinidad	7

South America

Recife	Brazil	6
Maracaibo	Venezuela	7
Barranquilla	Colombia	7

Central America

Veracruz	Mexico..	.7
Tampico	Mexico..	.7

North America

Baltimore	Maryland	9
Boston	Massachusetts	9
Charleston	South Carolina	9
Dover	Delaware	7
Halifax	Nova Scotia	8
Houston	Texas	
Jacksonville	Florida	
Key West	Florida..	.8
Miami	Florida..	.9
New Orleans	Louisiana..	.8
New York..	New York..	.9
Norfolk..	Virginia..	.9
Portland..	Maine	.7
St. Johns..	Newfoundland	.7
Savannah	Georgia	.8
Tampa	Florida	8
Wilmington	North Carolina	.8

North Atlantic

Reykjavic	Iceland	8

Europe

Amsterdam	Netherlands	.8
Barcelona..	Spain..	.8
Bergen..	Norway	8
Bilbao	Spain	7
Copenhagen	Denmark	.8
Dublin	Ireland	.8
Glasgo	Scotland..	.8
Hamburg	West Germany	.9
Istanbul..	Turkey	.7
Le Havre..	France	.8
Lisbon	Portugal..	.8
Marseilles	France	7
Naples..	Italy..	.8
Stockholm..	Sweden	.8
Thessaloniki	Greece..	.6
Venice..	Italy..	.7

Arabia/Africa

Alexandria	Egypt..	.7
Casablanca	Morocco	.7
Dakar	Senegal	.6
El Djazair	Algeria..	.6
Haifa	Israel..	.5

Equipment: ROSCOE Sonar/Camera Platform
Price: $80,000
Ship required: Kingfisher or larger

The "ROSCOE," or Remote Operated Sonar/Camera Ocean Explorer, represents the ultimate in achievement for underwater sonar and video sensing equipment. Our design is right out of the best Computer Aided Design equipment, and the unit itself is built with the very latest Computer Aided Manufacturing processes.

The ROSCOE was designed with four essential points sharing top priority First, the ROSCOE had to be tough. We used the finest in steel for the protective cage, and the best in fasteners for assembly The sonar unit we built into the ROSCOE is the same design as the unit that rode to the bottom of the Marianas trench. The camera unit chosen occupies the highest position in the camera world, Mars; it is the same design that was sent to Mars on the Viking missions, and has an effective underwater range of 200 feet.

Second, the ROSCOE had to be useful. We custom designed the winch and cable assemblies with the same care we designed the ROSCOE itself. The winch is a high power unit, capable of raising and lowering the ROSCOE at 500 feet per minute, more than twice the speed of any competing product. The on-deck cradle is built from the same steel that protects the ROSCOE's sonar and camera units.

Third, the ROSCOE had to be easy to use. The ROSCOE requires only two station monitors — one for the camera monitors, one for the sonar chart recorder. The ROSCOE requires only one winch operator. The nearest competitor's unit requires three. The ROSCOE requires four maintenance operators, equal to our nearest competitor.

Fourth, the ROSCOE had to be right. Right when we designed it, right when you use it, and it had to have the right price. $80,000 is a small price to pay for the best.

The ROSCOE is a large unit, and it does require a Kingfisher class ship (or larger) to operate.

Equipment: Stormalert Weather Radar
Price: $10,000
Ship required: Moyu or larger

Weighing in at only 100 kg, the Stormalert is one of the lightest weather units available. Combining state-of-the-art technology in local radar, and high sensitivity in satellite reception, the Stormalert gives the intelligent navigation officer not one, but two accurate weather reports.

First, the local radar scan, appearing on a high quality rectangular display, gives you a high-resolution view of the weather conditions near your ship. Secondly, the North Atlantic Cloud Cover and Rain Intensity Map (NACCRIM) shows you current cloud cover conditions over the entire area.

The most exciting addition to the Stormalert is the land mass overlay feature The NACCRIM display screen overlays the cloud cover information on a map of the North Atlantic area

No other competing weather radar offers such a wide selection of features for such a restricted price. The Stormalert system features a maintenance-free design, but does require a station monitor.

Equipment: Titaloy Minisub
Price: $750,000
Ship required: Voyager only

The Titaloy Minisub is the absolute state of the art in underwater research and exploration. It is constructed from a super-strong compound consisting mostly of titanium. The Titaloy Minisub provides the most advanced method of deep-water exploration. With this minisub you will be able to explore depths greater than 12,000 feet.

The minisub features oxygen tanks with a large 8-hour capacity. A sub pilot is required to maneuver the sub. A diver must go along to operate the cameras and mechanical arm. There is also room for one observer in the sub.

Eight maintenance personnel, a captain/pilot and one winch operator are required to operate the Titaloy Minisub.

Equipment: Deep Six Deep Sonar
Price: $30.000
Ship required: Apprentice or larger

The Deep Six model deep sonar is just the right thing for your next expedition. It produces an ocean floor depth change chart with ascending areas being lighter, and descending areas being darker.

The Deep Six sonar unit weighs around 400 kg. It requires two crew members to keep it running, one for maintenance and one to monitor the output. The unit does not require a winch operator because the console has a deploy/retract-sensor switch. Also, you can start and stop the printout without stopping your ship.

Equipment:Hydroscan Ship's Sonar
Price: $20,000
Ship required: Moyu or larger

Hydroscan, Inc.'s ship's sonar is the latest in a long series of successful sonar products. From the company's incorporation, the staff has been dedicated to providing the finest in underwater sensor equipment available, and the ship's sonar is no exception.

Just from looking at the case design, you can begin to appreciate the care and planning that went into this unit. Special features include stopping and starting the chart recorder without having to retract the sonar sensor, and the use of standard 8 1/2-inch computer feed paper.

Also for your convenience, the recording unit has a raise/lower sensor control, to alleviate the need for additional personnel to operate the winch base.

The chart recorder has also been designed for ease of reading. Output is in the form of a four-color false color printout, with black being the lowest, red, then blue, then white being the highest.

The ship's sonar overall system weight is quite low, at only 300 kg, and that will make your mounting problems virtually disappear.

The ship's sonar unit will require one person to maintain, and, of course, you will need a technician to monitor the chart recorder.

Equipment:Moover Suction Tube
Price: $5,000
Ship required: Moyu or larger

The Moover model suction tube is designed far the discriminating explorer. With its high power motor assembly double layer filter, and high density plastic noncorrosive jointed extraction pipe, your underwater searches should proceed apace. But don't just take our word on it, read this unsolicited letter from one of our customers.

Dear Moover,

About sixteen months ago, we were seeking recommendations for an underwater sand removal unit. Recommended to us were your Moover unit, UW Industries' Hydrolift, and Sanduvac's Beta II unit.

We took the Beta II on a test dive. It worked fine for a time, but its high capacity motor and low capacity filter was creating quite a flooding problem. We returned it right away.

The Hydrolift was a fine unit, but after reviewing the price ($50,000) and the capacity (one liter per hour), and after extensive time/distance and human engineering calculations, we thought it might be just a tad slow. We decided to try out your Moover.

Almost at once we knew we were onto something special. We liked the design. Your filter size of 10x10 feet was optimal for our purposes. The motor specs were impressive, showing a low power usage and a quite respectable 25 gallons per minute maximum removal rate.

The pipe we were more impressed with. The interchangeable tips for the pickup were also a well-appreciated touch.

Your unit was also the lowest in requirements for maintenance/operators. Your Moover only requires three maintenance workers to maintain, and is so simple to operate that no special diver training is required.

We hope to get many hours of use from our Moover.

Sincerely,
Edwin Esteban, Esq.

Doesn't that just say it all? Try a Moover.

Equipment: D + Bathysphere
Price: $350,000
Ship required: Kingfisher or larger

Along with the sphere itself, we supply the crane and boom. The crane cable both supports the sphere and has feeds for high pressure air (for the sphere itself — not for the diver's tanks) and wiring for the intercom and the video camera.

Inside the sphere itself, there's room for four divers for eight hours. When the divers are ready to ascend, they close the hatch, and the sphere can be used as a decompression chamber up on the deck, so there is no need to raise it slowly.

There's a cable-riding cradle for raising and lowering air tanks. There is no provision for filling scuba tanks in the sphere itself (spark and smoke hazard), so all that is necessary is to attach up to three tanks to the cradle and call the surface. The tanks can be raised in under three minutes, refilled on deck, and lowered.

The crane is rated to lower the bathysphere at 50 feet per minute, and the maximum depth for divers using the bathysphere is 400 feet.

You'll need to hire five maintenance people, as well as a station monitor and a crane operator. Also, the bathysphere weighs a good bit, as well as being a basically large piece of equipment, so you will need a fairly large ship to mount it to.

Table 1-3 Equipment reference

Equipment	Price ($)	Ship	Wt. (kg)	Technical level	Swabs required	Crew required
Weather Radar	10,000	Moyu	100	1	0	7
Ship's Sonar	20,000	Moyu	300	1	1	6
Deep Sonar	30,000	Apprentice	400	1	1	8
Suction Tube	5,000	Moyu	400	0	3	5
Sn/Cm Platform	80,000	Kingfisher	2,200	3	4	9
Magnetometer	10,000	Moyu	300	1	2	8
Bathysphere	350,000	Kingfisher	7,000	2	5	8
Minisub	750,000	Voyager	15,000	2	8	9

Your crew

Why a crew?

If you tried to SEARCH FOR THE TITANIC all alone, you would not get very far. Therefore, of course, you need a staff. In this game, there are basically two kinds of employees, the "swab" and the "non-swab." That's not really fair, but it's the easiest term to say.

Swabs

Swabs are, basically, your support staff. The swabs keep everything in working order. From cleaning the deck, to maintaining the engine, to repairing things that are broken, the swabs are as important as your technical staff. When you obtain a piece of equipment, you may or may not have to hire additional swabs to maintain it. For example, the minisub requires eight swabs. Swabs are hired automatically; each time you leave port, you hire the full complement of swabs. Swabs are paid $70 a day, and, of course, eat, drink and require a place to sleep.

Staff

Staff, or technical crew, are individually more important than swabs, i.e. their individual talents are more important than just being a warm body (as it is for swabs). Therefore, you must select your staff carefully from the roster of available personnel at each port.

There are five different types of staff positions. They are: captain, navigation/radio, diver, technician, mechanic and doctor.

Captain

The captain has a lot of responsibility. He makes all the decisions on the ship. He is the ultimate authority. He makes a lot of money. In our game, base pay for the captain is $310 a day.

Navigator/radioman

The navigator is pretty much second in command. He has gone through a lot of specialized training to become a certified navigator/radioman. Every navigator must know not only the latest methods of navigation, via satellite and LORAN, but also must be able to navigate the ship with the aid of nothing more than a chart and a sextant.

To become a qualified radioman, he also must know vast amounts of information about such things as radio wave propagation in storms, Morse code emergency transmissions, and what frequencies to use for any of a number of things. He is not paid as much as the ship's doctor, but his base pay is still a respectable $230 a day.

Diver

The divers are pretty much the whole reason for the expedition. Even so, there are a lot of divers, and since their training, while intensive, is nowhere near the level of a radioman or captain, they only pull in $110 a day.

Keep in mind that "only" is a figure of speech here. That's still about $40,000 a year. Ship-bound crews are paid a lot of money, because there's nowhere to go except the water, and you can't take your family with you.

The divers in the game are assumed to have and be familiar with their own equipment, including scuba tanks, regulators, masks, and wet/drysuits. They are all supposed to be competent 10 use three tank packs, and to dive 10 199 feet with tanks. Using the bathysphere, they may go to 400 feet.

For more information on diving, refer to Chapter 4.

Technicians

The technicians are the people who read and interpret the electronic readouts. A technician (in this game) is assumed to know the meanings of the various charts and reports generated by the sonar, magnetometer and camera displays.

Hiring an experienced technician is important, because if one of them misreads a sonar chart, you could sail right over a wreck and never know it. Technicians make about $170 a day.

Mechanic

The mechanics are the folks who do the dirty work. Not a disgrace at all, when things need to be done, or things need repairs, they are the most knoedgeable people around. Hiring an cxpcricnccd mechanic is important, because if an incxpcricnccd mechanic fouls up with the minisub crane, you could well be in for some serious problems.

The mechanics control the platform winch, and the cranes for the bathysphere and minisub. When repairs are needed, they direct the swabs cm the repair jobs. Their salary is about $ 130 a day.

Doctor

Last on the list is the ship's doctor. As with all doctors, he makes a large sum of money. Unlike most other doctors, he makes money even when everyone on board is healthy. The ship's doctor is not equipped with the latest medical technology has to offer. Hs job is pretty much the same as in the M.A.S.H. units in the Korean war; he does his best Io keep a patient alive until he can be evacuated to a proper hospital. The doctor will, of course, treat minor abrasions, bouts of the flu, and other disorders to the best of his ability. He makes about $270 a day at sea.

Hiring your staff

When hiring, you will be presented with a list of people who are available for the position. All of the people on the list are qualified for the job in question, but all of them have differentf capabilities. Each applicant has a different number of years on the job, and a different quality of work factor. Each applicant also has a per diem (per day) salary that is based on the position for which he applies, how long he has been working in that field, how good he is, and, to make things more interesting, a random factor.

So, when you look over the list of applicants, look at how long they've been on the job and look at their salary requirements. You could take a chance on a relative greenhorn, or you could go with a more cxpcricnced career man. Because of t he random quality facotr, you could be pleasantly surprised, or you could just as well be stung.

In general, the longer a person has been doing a job, the better he is at it; the higher his price, the better he is at his job. Again, look out – those random numbers can wreck your expedition.

Also, you won't be likely to find highly trained people at smaller ports, so be sure to do all your hiring at a high-tech city.

The job positions

Table 1-4 Type Of job, by job position, with base pay

Position	Type or Job	Base Pay
Captain	Captain	$310
Navigator/radioman	Navigator	$230
Diver	Diver	$110
Weather radar	Technician	$170
Ship's sonar	Technician	$170
Deep sonar	Technician	$170
Platform sonar	Technician	$170
Platform camera	Technician	$170
Platform winch	Mechanic	$130
Magnetometer	Technician	$170
Bathysphere	Technician	$170
Bathysphere crane	Mechanic	$130
Minisub pilot	Captain	$310
Minisub crame	Mechanic	$130
Ship's doctor	Doctor	$270

The captain

The captain, obviously, requires a captain applicant. If you get a low-quality captain, the voyage itself will not be affected, but all the other random factors will be adversely influenced. If you should lose a captain while at sea, all research must stop, and you must go to the nearest port as soon as possible.

Navigator/radioman

The navigator/radioman needs a navigator/radioman applicant. A poor performer in this job will be more likely to run aground, or into reefs or other hazardous formations while near shore. He will also be less likely to find a weather report on. the radio set. If you lose. your navigator/radioman, you will not be able to use the radio for anything except calling for the tug boat, and emergency rescue.

Diver

The diver position needs diver applicants. The low-quality diver will be not be able to search the ocean floor as well as a better diver. He is also more accident-prone, and can't stay underwater for as long a time as a more experienced diver. If you lose a diver, your ship will not be adversely affected, but of course you will have a lower efficiency when you search for items on the ocean floor.

Weather radar

The weather radar job requires a technician applicant. Because this job is one of those you take on as game player, the actions of the weather radar technician are limited to warning you of approaching bad weather. If you find yourself with an inexperienced weather radar technician, you may find yourself trying to navigate through gale force winds, hail, and some of the worst rain imaginable, *unless* you periodically look at the weather radar screens yourself. Needless to say, it is suggested that you look at the weather radar frequently.

Ship's sonar

The ship's sonar position requires a technician applicant. The person in this position monitors the shallow water, or normal, or "ship's" sonar reports. When your ship passes over a wreck site in shallow water, the ship's sonar technician will alert you. If you get a bad technician in this position, it is possible for you to pass over a wreck and not be alerted - or possibly worse, to baalerted when there is no wreck at all. If you lose your ship's sonar technician, you will have to monitor the sonar printouts yourself.

Deep sonar

The deep sonar position also requires a technician applicant.Thii job is like the ship's sonar position in just about every way.

Sonar/camera platform sonar

The sonar/camera platform sonar position requires a technician applicant. Like the ship's sonar and the deep sonar, if you get a faulty employee, you may miss a wreck. Additionally, the sonar/camera platform must be kept within certain heights of the ocean floor to return accurate readings. Both the platform sonar and the platform camera employees monitor the platform height, so there is a double redundancy factor. However, if both platform sonar and camera operators take ill, you should retract the platform yourself, or it is very likely that you will crash the platform into a rock face.

Sonar/camera platform camera

The sonar/camera platform camera position requires a technician applicant. This person watches the live camera from the sonar/camera platform. As in all the other monitor positions, a poorly trained employee may return false positive or negative results. The camera technician shares with the sonar technician in keeping the sonar/camera platform at an optimum height. Not only is going too low a bad thing, but going too high is also not beneficial. You will not damage the platform by going Eoo high, but you will not see much of anything, either. Both the sonar and camera displays are simulated by the game, so you may monitor the outputs yourself.

Sonar/camera platform winch

The sonar/camera platform winch operator position is one of the few positions that requires a mechanic applicant. The winch operator controls the **docking** and deploying **of** the sonar/camera platform. As you might well imagine, this is **not** a procedure to be left to chance, and if you hire a winch operator who is not good at his **job,** you might well be left with **a $350,000 lump of twisted steel. If you lose your** winch operator, you can still dock the platform, but your swabs will be doing the work. It is unwise to attempt to operate the sonar/camera platform without a winch operator.

Magnetometer

The magnetometer monitoring position requires a technician applicant. The applicant, like sonar and camera technicians, should be of quality. If not, you will likely get false readings. The magnetometer readout is echoed onto the screen in this game, so you can double-check your magnetomcter technician, if you want.

Bathysphere.

The bathysphere operator requires a technician applicant. Because the lives of the divers operating out of the bathysphere rest in your operator's hands, you should **be** very careful in selecting a good one. The bathysphere operator monitors air pressure and mixture, the cable strain gauge, sphere depth, and the audio/video link with the divers. The bathysphere operator also controls the depth of the bathysphere, but the crane operator actually raises or lowers the sphere.

Bathysphere crane

The bathysphere crane operator requires a mechanic applicant. It's a good idea to find a good operator. If your crane operator makes a mistake, your bathysphere could find itself lowering a bit faster than plans call for. With divers in the bathysphere during both ascent and dcsccnt, this is a bad thing.

Minisub pilot

The minisub pilot must be a captain. The minisub is a separate ship, and ships need captains. Many things can go wrong with a minisub, as they can with a regular ship. If there is not a "designated dccidcr," confusion and hostility can break out.

Minisub crane

The minisub crane operator requires a mechanic applicant. He'll direct the morning's preparation of the sub. He'll also control the crane used to deploy the sub. When the sub has

surfaced again, he'll load the sub back onto the ship's surface and direct the servicing of the sub.

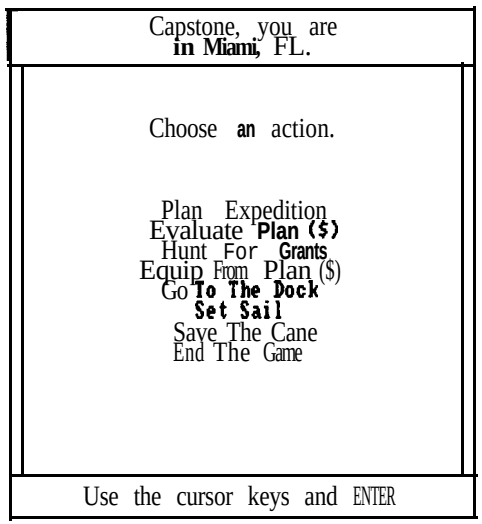
Your minisub crane operator is an important part of the minisub team, so be sure to get a competent one. An error in crane operations could cost a lot of money.

Ship's doctor

The doctor's purpose is really just to keep people alive long enough for them to reach proper emergency services. Nevertheless, it's important to hire a good doctor for obvious reasons.

2 Phase I: Planning your expedition

Using the menu system



The main menu

All of the action in Phase I revolves around basically one menu, the main menu. If you are not sure how to get to this menu, refer to the SEARCH FOR THE TITANIC user's manual that accompanies this program for information on starting the game.

The screen format in Phase I is really very simple. At the top of the screen is an area with a blue background. This area always tells you where you are, or what you are doing.

The greater portion of the screen, with a green background and black border, is the menu area. All the menu items will appear hcrc, as will your highlight bar. Normal color for text in the menu box is black, while the highlight bar changes this text to white.

The bottom line on the screen also has a blue background. This line basically tells you what to do. Usually it will just say "Use the cursor keys and ENTER," which are condenscd instructions for using the menu system.

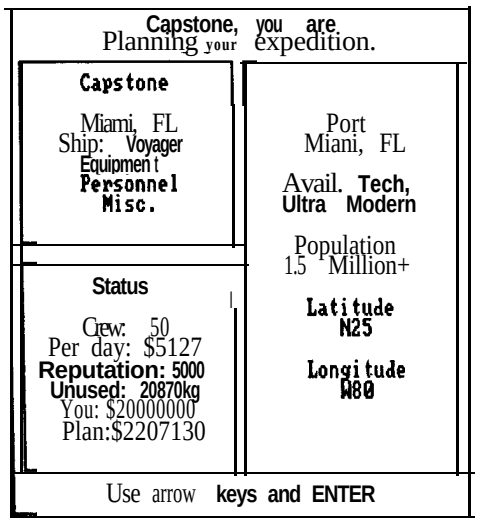
When in Phase I, you basically just make menu selections. To choose an item on the menu, move the highlight bar with the ↑ and ↓ keys. To select the highlighted item, press the ENTER key.

To back up out of a menu, press the ESC, or "escape" key.

The selections of the main menu

There are eight menu options on the main menu. Their descriptions follow.

Plan Expedition



The Plan Expedition menu

This main menu item is where you will spend the most time in Phase I. After you select the *Plan Expedition* item, the screen format changes into three windows.

The green window, at the upper left, is where all your menu choices take place. The usual ↑, ↓ and ENTER keys operate the highlight bar.

The **brown/dark red** window immediately below is your status window. It says *Status,* **and has** various other bits of information that will be explained below.

On the right, in the cyan/light blue window, is the *information* or *detail* data. Throughout the entire plan expedition menu tree, with a few notable exceptions, the blue window will give further detail about the item upon which the highlight bar rests. If you move the highlight bar with the cursor keys, the blue window will update to reflect your new selection. You do not need to press ENTER to activate the blue window.

The uppermost choice in the menu window may not be very clear. The only thing on the line is the port you are currently visiting. The information window displays some characteristics of the port, including the available technical level (important for hiring people, and buying equipment and ships), population, latitude and longitude.

The next choice is more clear: the word *Ship* followed by either **None,** or the type of ship you have. If you have a ship, the information window shows you the ship's current value in port (its resale value), condition (rarely 100 percent), usable load, required crew (swabs), and number of places for people on the ship. Below that is the ship's status – whether you own it or rent it – and (if appropriate) how much the ship costs per day to rent.

If you don't have a ship, the information window just shows you how much weight you have planned to put on your ship so far.

The next choice, *Equipment,* is straightforward. The detail screen shows you an overview of the available equipment. If the item shows No, you neither own nor plan to own it. If the item shows **Buy,** you have selected that item as one you will buy when *you Equip from Plan.* If the indicator is **Own,** you already own that piece of equipment.

The next option, *Persormel,* shows you, in the detail screen, an overview of your crew. For all jobs except Diver and *Rqrd Support,* there will either be a ---, a No or a Yes next to the job position. A – means that you do not own, nor have you planned to own the piece of equipment that requires that job to be tilled. A No means that you have or want to have that equipment, but have not filled the position. A Yes means that-the position is already staffed.

For the *Diver* and *Rqrd Support* lines, a number indicates how many of each *you* have. The *Rqrd Support* group are rcfcrrcd to variously as *maintenance* or *swabs,* as well.

The *Misc.* option shows in the detail area four important items that just didn't fit into any of the other menus. *Total Days* is the number of days you expect to spend on the whole expedition. *Expected Mileage* is the amount of miles you expect to travel. The Wreck *ID#* is the code number of the wreck you have chosen to seek. *Start Month* is the month on which you plan to begin your expedition.

As in all menus in Phase I, press the ESC key to return to the previous menu (in this case, the main menu}.

The brown status window will keep you informed about your current game position. The first statement tells YOU how many people (including yourself) you have hired to go on the expedition. You should check this number against the number of berths in each ship; you will not be allowed to leave port if you have more crewmen than berths to accommodate them. Don't forget to include yourself in this number.

Below that is the *Per Day* line. This shows you how much money the expedition will cost you each day you are at sea. The number includes your crew's salaries, as well as ship rental and food and water. Fuel usage is not included as this figure depends on whether you are moving or not.

Beneath that is the *Reputation* line. This shows how well recognized you are in the underwater oceanography world. The higher this number, the better you will be funded when you ask for grants.

Under that (if you have a ship) is your *Unused* load number. This number shows you how much more weight you can put on your ship before you sink it. If you do not have a ship, this lime will be blank.

Below that is *your* **money.** This displays how much hard cold actual bank account cash you have. When you pay for something, the money comes out of this number. When you get a grant, this number increases.

The last line is the *plan* money. This number indicates the grand total of all the money you have planned to **spend. It** represents ship rental, salary, food and water costs for the entire length of the trip, plus any equipment you have planned **to buy, plus the estimated mileage of your expedition. If you actually buy something, this number should** decrease.

Choose A Port

When you select this option from the Plan Expedition menu, the menu window expands **to the full height of the** screen. A new menu is displayed, containing the names of all the ports **in the game.** The **highlight bar is automaticat**ly placed on your current port of **call, while the** information window shows the same information about the current port

that was shown in the previous menu..

If you move the selection bar up or down, the information window updates to show you information about the highlighted port. There are many more ports than will fit on *one* screen, so if you try to move the bar off the top or bottom of the screen, if possible, more ports will appear. There are three screens of ports. The first covers ports from Port of Spain, Trinidad to Norfolk, Virginia. The second screen lists ports from Baltimore, Maryland to Le Havre, France. The third screen includes ports from Bilbao, Spain to Dakar, Senegal. See Table l-2 for a list of all the ports.

To change your port of call, press ENTER when the highlight bar is on your choice. If you have a ship, you will get an error message. Since changing ports with this method involves flying, and ships just don't fit well into the overhead compartment, you will not be able to go.

Otherwise, you will be told what the airfare is for you, your staff and equipment. It is likely to be a lot of money. If you do not wish to change ports press **N;** otherwise press Y.

To back up to the prior menu, press ESC.

Ship

Pressing ENTER on this option will generate one of two screens, depending on whether or not you have a ship.

If you do not own a ship, go down to the dock at the port and start looking at the ships that are available. For each ship that shows up in the information window, you may choose to *See Next Ship, Buy This Ship* or *Rent This Ship.* Of course, you can press ESC and return to the other menu.

There are, theoretically, an infinite number of ships available, and you can see them all by pressing See Next *Ship.* You will find that the condition of ships and the price vary with the port where they are berthed.

When you select *Buy This Ship* or *Rent This Ship,* you don't actually spend **the** money until you *Equip from Plan.*

If you *do* actually own or rent a ship, you will be asked "Do you really want to Sell/Return **your** ship?" Press Y to confirm this.

If you have only planned to own or rent the ship, the menu will say "Are you sure you don't want the ship?" Press Y to erase **your** plan.

Equipment

This menu lets you select your equipment. You can choose to plan to buy equipment, or to sell equipment you already own. The menu portion of the screen shows you the plan status of all eight items. Next to each item name is an indicator. If you see **No,** you neither own, nor plan to buy that item. **A Buy** means that you are planning to buy it (and will do so with the main menu option *Equip From Plan).* An **Own** means that you already own it.

When you move the highlight bar to an item marked **No,** and press ENTER, the display changes to Buy. If the item says **Buy,** you effectively "change your mind" about buying that item. If the item shows Own, and you press ENTER, you are asked if you really want to sell that item.

As you move the highlight bar up and down, the detail screen shows information about each item. Price, number of required crew, as well as a clearer explanation of the item's status, are shown.

If you are in a low-technology port, and want to buy a high-technology item, the detail screen tells you about the extra charge. See the chapter about equipment and ports for information on technical level.

Note that if you have already hired people to run an item, and you choose to sell it, those people are automatically fired.

See the chapter about equipment, as well as the glossary, for more information on each item of equipment.

Press **ESC** to exit from this screen.

Personnel

Once you have made your choice of ship and equipment, you need to find people to run them. This is likely the most complex part of Phase I, and you might be confused the first time around.

The first thing to know is that people can have two talents. That is, a captain can also be (for example) a technician. When you hire a dual-talent person, the program attempts to find an open position for both talents. This is not indicated on the screen. The screen only tells you if a position has been filled; it does not indicate who is doing each job (with a notable exception).

Capstone you are looking at the crew list.

Ship's Crew	Overview
Overview	$2397 per **day**
Captain:Yes	**Gerald Porter**
Navigator:Yes	**Frank Schainker**
Divers : 1	**1 Diver**
Weather **Radar:Yes**	**Gerald Porter**
Ship's Sonar:Yes	**Dave Snyder**
Deep Sonar:Yes	**Paul Clifford**
Pltform Sonar:Yes	**Rich Coile**
Pltfm Camera:Yes	**Gordon Watts**
Pltfrn Winch:Yes	**Frank Schainker**
Magnetometer:Yes	**David Sawyer**
Bathyscaph:Yes	**Louis Watts**
Bthysc. Crane:Yes	**Dave Snyder**
Minisub Pilot:Yes	**Doug Jannetta**
MiniSub Crane:Yes	**Paul Clifford**
Ship's Doctor:No	
Rqrd Support: 39	39 Swabs

Use arrow keys and ENTER

The *Personnel submenu*

The menu screen shows you a roster of all the job positions possible. Next to each name is an indicator. If this shows **–,** you do not need to fill that position. A NO shows that you need a person for that job, but have not hired one. A Yes shows that you have already hired someone for that job.

The only exceptions are the *Divers* and *Rqrd Suppori* lines, which show you how many of each you have.

At the top of the menu is an item called *Overview.* If the highlight bar is resting on this item, the detail screen shows you the names of your employees. Each name is to be associated with the job to the left of it, on the menu screen. The *Diver* and *Rqrd Support* lines don't show **names. In this** way, by checking names, **you can see which people are performing** two jobs.

When your highlight bar points to any single job position, the detail window shows you the following:

For-jobs: You don't need to hire someone for this position.

For **No** *jobs: You* have not hired someone. You are also shown what type of job this is (captain, mechanic, etc...).

For Yes jobs: You are shown a rap sheet on the person you hired (fully explained below, in the section about hiring personnel).

When you highlight the *Divers* position, the detail screen **shows you the names of all** your **divers.**

To actually hire (or fire) someone, move the highlight bar tot he appropriate position on the menu and press **ENTER.** If the job indicator reads **–,** nothing will happen. If the in-

dicator shows Yes, it changes to **No,** and you have just fired one of your employees.

If the indicator is **No,** the screen changes. The menu area becomes a list of the names of available people who are qualified for that position. The detail area becomes the "resume" for each person. As you move the highlight bar up and down, the resume shows that person's statistics, including what type of work he or she does (this is where you will discover if a particular person is multi-talented), how many years he has been doing it, and what his salary is. For simplicity's sake you are not offered the opportunity to negotiate salary.

Press ESC if you do not wish to hire anyone. Press ENTER to hire the highlighted person.

In the case of divers, you do not immediately see a list of names. First you see a roll call of all 16 possible diver jobs. If you have hired a person for a slot, his or her name will show. If not, the word *Open* appears. If you press ENTER on an open position, a list of available divers comes up, as was described above. Note that divers can't be multi-talented. You may select from the applying divers with the ↑, ↓, and ENTER keys, or press ESC to exit the menu.

If you press ENTER on a diver's name, you effectively fire him or her.

Note that the game has fifty different first names, and fifty different last names. The program combines them to come up with 2,500 different employee names, but you still are likely to have "siblings," as well as people with the same first name. This won't cause a problem anywhere, even if both first and last names are identical!

Exit from the personnel menu by pressing ESC.

Misc.

This menu combines four unrelated items: *Plan Days, Plan Distance, Wreck Number* and *Start* Month. The menu window presents the four sclcctions, while the detail window shows their values. To change an item, move the highlight bar to an item and press ENTER.

Plan Days is your expected number of days at sea, for the entire expedition. If you expect to return to port in the middle of your expedition, you need to add more time than if you were just going out and coming back.

Plan Distance is the number of miles you expect to traverse during your expedition. Both it and *Plan Days* are used to figure out how much food, water and fuel you will need on your trip.

When you want to change either of the above values, select the appropriate line with the highlight bar and press ENTER. The menu window changes to include three Add # options, and a *Zero* option. Select any of the add options to increase the value by that amount. Select Start at Zero to reset the value to zero.

Press ESC to exit from either menu.

Wreck Number is the actual number of the wreck you are planningto find. It is important to remember that the wreck that you specify here is the only wreck you will be able to find during your expedition. Look up the wreck number in the player map supplied with the game, or check the chart in Appendix C for the wreck number. This is the number you will enter here. The chart also shows additional details for each wreck.

Use the same method of entering the number as you would to enter plan days or distance. Press ESC to exit from this menu.

TIP: "The Fly" is a wreck that is easy to find by inexperienced oceanographers with little equipment and crew. Finding this wreck early in the game is an easy way to build reputation points.

Start Month is the actual month Phase II starts simulating when you set sail. Keep in mind that weather and ice patterns vary with the month. Choose your start month with the ↑, ↓, and ENTER keys, then press ENTER to select. Press ESC to exit this menu.

Evaluate Plan

The dollar sign next to this option indicates that selecting it will cost you money. When you choose this item, you pay a team of advisers $1,000, and they look over basically everything. Technically, all the information is there for you to come up with the same evaluation, but this is somewhat faster, and you also are given the opportunity to look at some graphs.

Press ESC to exit from the graph menu.

Hunt for Grants

Once you have made a plan, you can try to get additional funding. You must select an organization to approach, and then a tactic to use on the organization. Depending on your reputation and plan, you may or may not get money. Often, you will have to try many combinations or change your plan.

> *TIP: The Coalition of Starving Researchers is a group sympathetic to beginning oceanographers.*

In order to even be considered for a grant, you must have a complete plan for an expedition lasting at least one day.

As in real life, getting money from these groups is not easy, and at times you might feel like it is impossible. Suffice to say that *it is possible.*

Equip from Plan

Once you have the money to afford the things you planned to buy (your ship and/or equipment), you should buy them. Select the option *Equip Front Plan* on the main menu to do this. If you have anything in your plan that you haven't purchased yet, you will be shown a screen that asks if you want to spend x amount of dollars on item y. You can press Y to buy that item, or N to not buy it.

You can't buy things you can't afford, of course.

> *NOTE: Ijyou are renting a ship, and don't plan to buy any equipment, you can go directly to* the *dock.*

Go to the Dock

This menu branches out into two different selections. You can *Repair the Ship,* or *Buy Supplies.* Use the ↑, ↓, and ENTER keys to select your choice. Press ESC to return to the main menu.

Repair the Ship

This selection gives you the opportunity to repair hull damage on your ship. The program quotes you a price for repairs; press Y to repair the ship, and N to not perform repairs.

When you buy repairs, the ship is repaired to half of the way to new. For example, if your ship's condition is 80 percent, and you repair it, the new condition of your ship is 90 percent. 100 percent new condition minus 80 percent current condition leaves 20 percent. Half of 20 is ten, and 80 percent current condition plus 10 percent repairs is 90 percent.

Buy Supplies

This menu allows you to purchase food, water, fuel and repair parts for your ship. Use the ↑, ↓, and ENTER keys to select which you want to buy. Press ESC to return to the Dock menu.

The Food menu is similar to the other numeric selection menus (Wreck Number, Plan Mileage) in that you select one of three values to add to your current number, as well as having a *Zero* option. In the case of food, you work in days. When you buy a day's worth of food, you get enough food to sustain your crew for one day. This costs about $5 per person, per day. Each person eats about 1 kg of food a day. Press ESC to return to the Supplies menu.

The Water menu is just like the Food menu, except that a person's supply of water for a day only costs $1. Note that you are not actually purchasing water, you are purchasing desalination equipment and tanks. Press ESC to return to the Supplies menu.

The Fuel menu is very similar to the Water menu. A gallon of fuel weighs 3 kg and costs $1. You purchase fuel in increments of 25 miles. Press ESC to return to the Supplies menu.

Repair parts are purchased in a similar manner to the other three items. However, the detail screen has a section titled *Repair Factor.* It is recommended that this number be about 100 for maximum efficiency.

Set Sail

Quite simply, this option begins the simulator. You enter the part of the SEARCH FOR THE TITANIC known as

Save the Game

This option saves the game on the program disk. At this point, you may safely turn off your computer.

End the Game

This is the civil way to exit **SEARCH FOR THE TITANIC.** You are asked if you are sure about exiting. Remember to save your game before exiting.

3 Phase II:- Expeditions as a way of life

Phase II program overview

When you actually go out looking for a wreck, as opposed to just planning your expedition, the second program is loaded. This second program controls the operation of

Table 3-1 Screen elements by key and abbreviation

Key	Abbr.	Screen Elements
1	Rdo	Radio screen / Message board
2	Wxr	Local conditions /Weather radar Satellite world cloud coverage
3	Nav	World navigation / Atlas Satellite position sensor
4	Plt	Local navigation / Search recorder
5	Snr	Ship's sonar / Deep sonar Chart recorders for both
6	Pfm	Sonar / Camera platform Camera monitor / Sonar chart recorder
7	Mag	Magnetometer Magnetometer chart recorder
8	Div	Bathysphere / Minisub / Suction tube Divers / Dive log
9	Spl	Ship supplies / Damage control / Repair
0	Crw	Crew health monitoring'

your ship, your people and your equipment. As you will no doubt have noticed during your reading of this manual, there are a great many different and complex things to be done to successfully find a wreck.

To enable you to control all these things, the second program (Phase II) is divided into ten different screens. At the very bottom of the screen is a list of ten 3-letter words, abbreviations for each of the ten screens. The abbreviation corresponding to the current screen is highlighted; and as you change screens, the highlighted word will change.

To change screens, simply press the number key that corresponds to the screen you want. The list of words on the screen reads like this:

Rdo Wxr Nav Plt Snr Pfm Mag Div Spl Crw

General screen layout

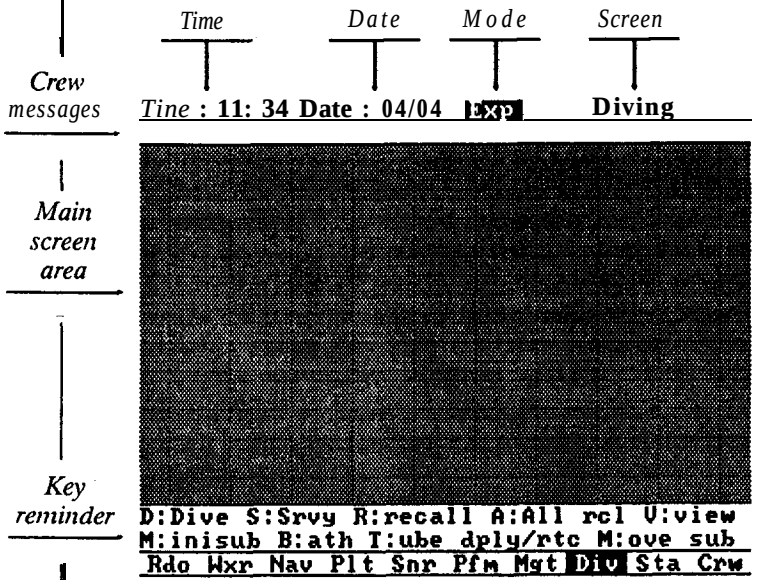
NOTE: If *your computer does not have an* ENTER, CTRL, ESC *or* **ALT** *key, refer to Appendix A for further information on which keys to press on your computer.*

The general layout of the display is fairly straightforward. The topmost line of the display shows you the time and date, whether you are in EXPloration or NAVigation mode, and what screen you are viewing.

The second line on the display, usually blank, is reserved for any messages from your crew. A beep will accompany any message that is printed in this area, so you will notice. After ten seconds of game time, the message will be erased. If you miss a message, you may look at the radio screen and review the last ten messages.

The largest portion of the display is in the center, where all the individual screen displays are. Each of the ten screens has a different display.

Below this, and just up from the ten-word indicator at the bottom, is the key reminder. This displays the more important keys that are relevant to the particular screen you are viewing.



General layout of a Phase II screen

If you press and hold the CTRL key, you will see, above the screen indicator, a chart to show you which key to press to get to each screen.

You can control the sound effects in the game with three keystrokes. ALT-N, for "normal," will cause all the sounds to be heard. ALT-Q, for "quiet," will cause only the message line bell to sound. ALT-S, for "silent" will shut off all sound.

The only other keystroke that works on all screens is ALT-W. Use this key to speed up time in the game. Press it again to return to normal time.

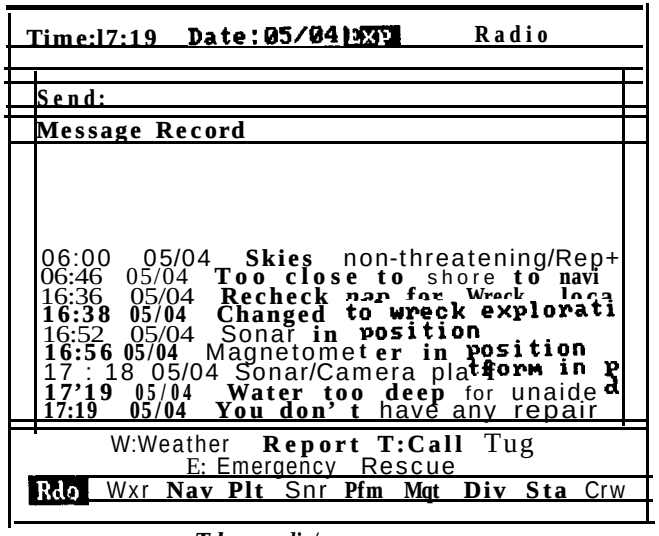
The Phase II screens

Below are complete descriptions of each of the 10 Phase II screens, and the keys you use to control them.

Rdo: The radio/message screen

Press 1 to call up this screen.

Screen layout



The radio/message screen

The screen is divided into a large message board, and a smaller radio transmission readout.

What you can do

You can transmit any of three messages on your radio. These are: ***Request weather report, Call***ing ***boat,*** and ***Require emergency assistance.*** You may also review the last ten messages from your crew, along with the date and time they occurred. The messages will be truncated to fit on a line, but you should still be able to make out the content.

Keys to press

Press **T** to call the tug boat when returning to port. If you arc not within one of the tug calling areas for each of the ports, you will get an error message. If you are, though, you will be told that you have live seconds to change your mind. When the tug boat reaches you, you will be returned to the first half of the program (Phase I) at the main menu. Refer to Chapter 2 to read about Phase I.

Press W to request a weather report. Your radioman will radio around locally in the direction you are heading, and try to find a boat or port that knows how the weather is doing. The effective distance is about 100 miles in the direction you are going.

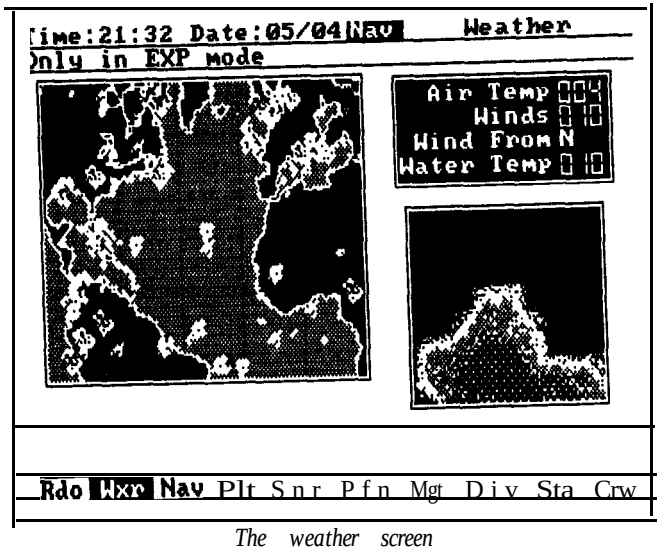
Press **E** to signal that you require emergency help. Basically, this aborts your expedition and subtracts about five reputation points.

NOTE: Your ship stops ***moving*** *when you enter this screen.*

Wxr: The weather screen

Press 2 to call up this screen.

Screen layout



The weather screen

In the upper right is the display of local conditions: air temperature, wind speed, wind direction and water temperature. All temperatures arc given in degrees Celsius (“C). If you purchased weather radar, the upper left shows the cloud coverage for the entire game area, and the lower right is your local weather radar.

Interpreting the displays

The world cloud coverage map shows an outline of the coastlines in the game overlaid by all the clouds. The color code for rain intensity is as follows:

White: light showers;
Blue: heavy rain;
Red: severe weather conditions,

The local weather radar shows the weather within a **100-mile** radius of you. The color code is the same as it is for the *world cloud* coverage map.

Keys to press

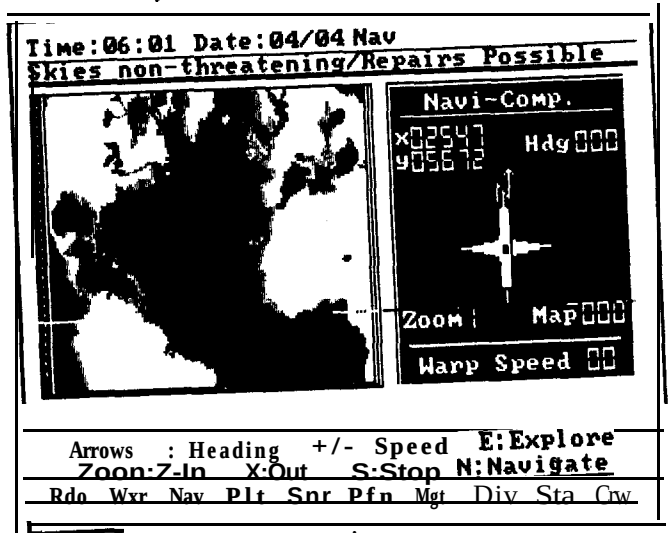
There are no keyboard options on this screen.

NOTE: Your ship stops moving when you enter this screen.

Nav: The world navigation screen

press 3 to call up this screen.

Screen layout



The world navigation screen

On the right half of the screen is your navigation computer; on the left half, your navigation atlas. The navigation atlas contains about 100 accurate maps, in three separate zoom levels As you begin the game you are at zoom level 1, the least-zoomed level. There is only one map at zoom level 1, the world map. As you navigate your ship, you will often see a "moving lights"-type display around an area on the atlas These indicate a map to which you can zoom. There are three levels of zoom, with level 1 being the largest map (that with the least detail).

The navigation computer has many important bits of information. At the upper left of the NavComp is a pair of numbers preceded with x and y. These indicate your coordinates in the game. They do not correspond to actual latitude and longitude, but during the game, you should use them as if they did. In this game, the coordinates vary from

0 to **16800** in the horizontal, and 0 to 12400 in the vertical. Each coordinate represents, very approximately, a quarter of a mile. Therefore, the world map, which shows the entire area from 0,0 to 16800,12400, is about 4,000 by 3,000 miles.

Below the coordinate display is your compass. The red portion of the needle always points north, while the top of the compass always points in the direction your ship is heading.

Below your compass arc the zoom level and map number indicators. *Map number* is purely for your reference, and plays no important part in the game. Zoom level is important when used with the last item on the NavComp screen.

Warp Speed, while amusingly named, is really a most apt title for what really takes place. If SEARCH FOR THE TITANIC were to operate on a purely real-time, basis, you would have to play for about 6 days to move your ship to the area where the Titanic sank. Warp speed varies from 0 to 10, and is explained further below.

Interpreting the displays

Your ship's position is shown on the atlas by a small black dot. The dot may be hard to see, but even as it stands, that dot is an incredible exaggeration of your ship's size. At zoom level 1, that dot represents about 625 square miles.

As was said, you will often find your ship in an area that is surrounded by a moving marquee display. This indicates that you may zoom in to see that area in higher detail. Level 1 zoom is about 4,000 miles wide. Level 2 zoom is one tenth that, or 400 miles wide. Level 3 zooms are only 40 miles wide.

Keys to press

Change your heading by using appropriate keys, as outlined in the chart on the next page.

The compass always reflects your current direction.

To display all available ports, press /. Each port will be shown on the navigation screen as a black square.

Toggle warp speed by pressing ALT-W. Change warp speed by using the + and - keys. It will be more convenient for you to **use** the ones near the cursor keys, but if your

Table 3-2 Navigation control keys

Home NW	↑ N	PgUp NE
← W		→ E
End SW	↓ S	PgDn SE

On IBMs and compatibles

7 NW	8 N	9 NE
4 W	5	6 E
1 SW	2 S	3 SE

U NW	I N	O NE
J W	K	L E
M SW	, S	. SE

On C64, C128, Apple II, Mac: Press the above keys in conjunction with the CTRL key (OPTION on the Mac) to move your ship in the desired direction. You can also use your computer's cursor control keys to move N, S, E, or W

On Amiga, Atari ST Apple IIgs, Mac II

keyboard lacks these extra keys, you may use the regular ones.

Warp speed, put plainly, does not change your ship's speed. It changes *the rate at which time passes.* When you navigate on this screen, and this screen alone, your ship always chugs at maximum cruising speed. Using the Warp Speed will not make you arrive at your destination any faster in game *time,* but it will speed up the ship's movement in real time. Until you become proficient at maneuvering the ship at high warp speeds, choose speed 1 or 2.

Very important to remember, as well, is that the amount of warp differs depending on your zoom level. This is not to confuse you, but to make navigating tight squeezes easier. While these explanations look very confusing in print, you will find that it is all very natural when you actually play the game.

When you select warp speed zero, your ship stops, and game time matches pace with real time.

A *very* important thing for you to remember is a ramification of what was mentioned before: that *game time* speeds up in warp speed. If you are not very careful when moving on the world map, you could run into a hurricane. For example, on the world map, at warp speed 1, for each second of real time, you move 11 miles of distance, and use up 66 minutes of game time.

You can change zoom levels by pressing **Z** to zoom in and X to zoom out. You can't zoom in unless you are in a marquee box, and you can't zoom out past the world map.

You will not be able to sail your ship off the world map. If you sail off the edge of a zoomed-in map, the atlas will show you the next same size map in the direction of your travel, if one exists. If none exists, you will be zoomed out to the next available map that covers the area in which you find yourself.

When you are as close to the wreck coordinates as you can get, press E to change to exploration mode. If you don't press E, you will not be able to use screens 4,5,6,7 or 8. If you are told you must recheck the map for the wreck coordinates, you are not as close to the wreck as you could be, and should try to move closer.

When you are in exploration mode, you can't move on the navigation screen. To do that, you must press **N** and change to navigation mode. You will not be able to leave exploration mode if any of your equipment is deployed.

Something to remember: The same thing that sank the Titanic can sink you. During winter months, stay away from northern latitudes. There is a distinct possibility of iceberg damage!

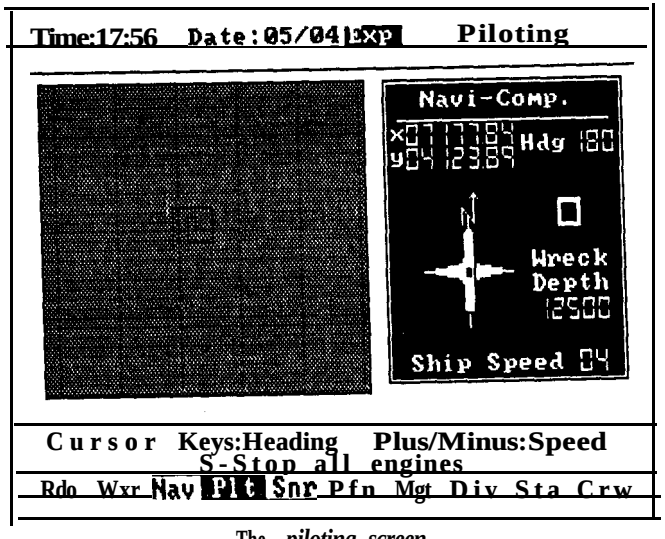
Table 3-3 Map dimensions and zoom equivalents

Map	Width	Pixel	"Zoom"
World	4,000 mi.	24 mi.	10,000
Region	400 mi.	2.4 mi.	1000
Port	40 mi.	1/4 mi	100
Pilot	4 mi	125 ft	10
Dive Map	25 mi	13 ft	1

Plt: The local navigation (piloting) screen

Press 4 to call up this screen.

Screen layout



The *piloting screen*

On the left of the screen is a map of the water around you. On the right is your navigation computer.

Here, the navigation computer differs somewhat from the one shown on the navigation screen. Instead of warp speed, the display is ship's speed. Two decimal places have been added to the coordinate display. The zoom factor and the map number have been removed; they have no purpose here.

Interpreting the display

Probably the most important item is the added decimal places on the coordinates display. While each whole number of coordinate change represents a quarter mile, **each** hundredth represents about 13 feet.

The area represented by the map on the left ***is*** about four miles wide. When you dive in an area on the dive screen, a corresponding area will change color on the map. This way, you can easily keep track of where you have explored.

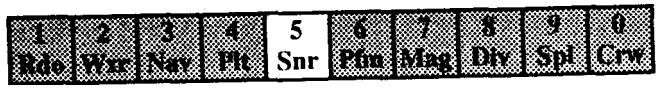
Keys to press

Control your heading with the cursor keys, the same way as used on the navigation screen.

Change your ship's speed with the + and - keys. You must be certain that you have finished looking for a wreck when you change to navigation mode. When you do so, the map of places you have explored is lost, and you must remember where you found the wreck.

> ***TIP: Refer to the Crew Reports section for information on how to use your crew's expertise in locating a wreck.***

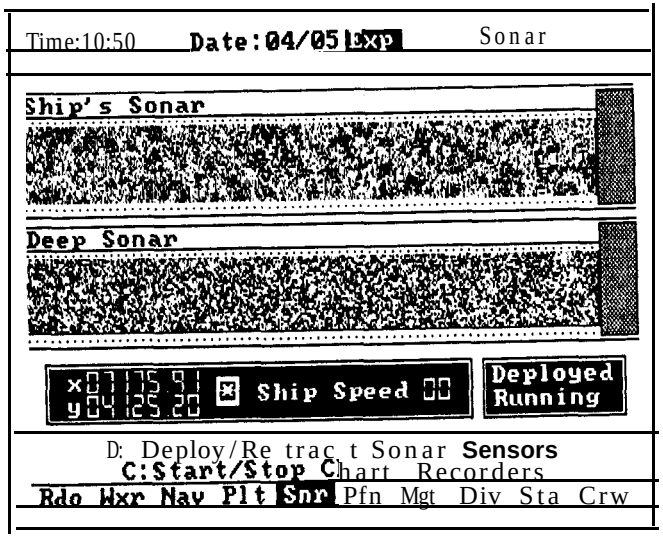
Snr: Ship sonar and deep sonar



NOTE: This screen appears only if you have purchased a sonar.

Press 5 to call up this screen.

Screen layout



The sonar screen

The top two-thirds of the screen are used for the two chart recorders – one for the ship's sonar, and one for the deep sonar.

The bottom of the screen shows your ship's position and speed, as well as the status of the sonar *sensors* and the chart recorders.

Interpreting the display

The chart recorders advance at a speed matched to the speed of your ship, so their displays will not become elongated. So, your ship must be moving for anything to show up on the chart recorders.

The top chart is for the ship's sonar. It returns the depth of what it sees in a false color format. Black areas are lowest, followed by red, blue and white as highest.

The bottom chart is for the deep sonar. It does not return depth, but rather difference in depth. Each scan by deep sonar starts at the top of the chart output, then scans toward the bottom of the chart. If the ocean floor at a point is lower than the point above it, the color will be black. If the two points are at a similar level, the color will be red. If the new point is higher than the old point, the color will be blue.

If the sonar sensors are not deployed, the chart recorders will print black.

Remember that each type of sonar has an optimum depth, and noise will creep into the displays at other depths. For example, ship's sonar will return noise if you try to use it at 10,000 feet.

Keys to press

Press D to deploy the sonar sensors. Deploying the sensors takes time, but you can be doing other things while you are waiting. (Or you can speed up game time by pressing ALT-W.)

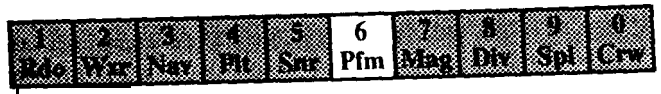
If the sonar sensors are deployed, press **D** to retract them. This also takes time.

If the sonar sensors are in the process of deploying or retracting, press D to make them to go the other way. Your ship's speed must not exceed 4 when the sonar is deployed. Going at too fast a speed with sensors deployed will cause stress on the mountings and inflict damage.

Press C to start and stop the chart recorders. Keep in mind that if the chart recorders are running, they will run even when you are not looking at this screen.

Even though the screen does not say you can do so, you can change ship's speed and heading on this screen with the usual keys.

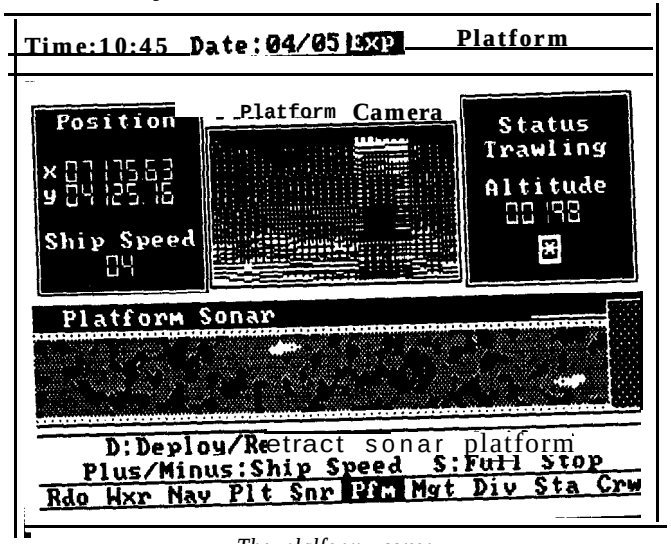
Pfm: The sonar/camera platform



NOTE: This screen appears only if you have purchased the platform.

Press 6 to call up this screen.

Screen layout



The plalform screen

The upper left window shows your location and speed. The upper right window shows platform status and altitude. The center window shows what the camera on the platform sees, while the lower chart recorder shows what the sonar on the platform sees.

Interpreting the display

The camera display is tilted slightly up from straight down. The area marked in blue next to the output of the chart recorder is the area that the camera sees. The camera's angle of view is approximately 0.2 coordinate points. As new areas are seen, they come into view dimly, and as the camera moves closer they gain brightness and clarity.

The sonar chart recorder is the same type as the ship's sonar, and represents depth in the same sequence of colors black as lowest, red, then blue, and white as highest.

Keys to press

Press D to begin the process of lowering the platform. This always takes a certain amount of time, for preparation of the platform. An additional amount of time is needed depending on how deep the water is, For safety, and caution, the platform is not lowered too fast.

When you wish to raise the platform, press **D to** begin the lengthy raising and docking process.

NOTE: The platform camera is only operative at depths of 300 *feet or lower.*

You must not exceed ship's speed 4 when the platform is lowered. Going at too fast a speed with the platform lowered will cause damage to the winch mechanism. If the winch receives too much abuse, the cable will eventually snap and you will lose the platform forever.

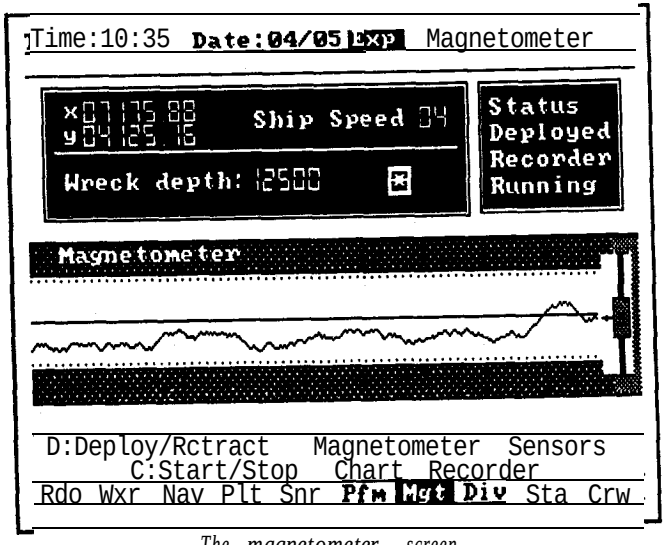
Although the screen does not explicitly say so, you may change ship's speed and heading with the usual keys.

Mag: The magnetometer

NOTE: This screen appears only if you have purchased the magnetometer.

Press 7 to call up this screen.

Screen layout



The magnetometer screen

The top half of the screen shows your position and speed, the magnetometer's status, and the chart recorder's status. The bottom of the screen has the magnetometer's chart recorder.

The chart recorder has only a single readout, the magnetic deviance. The recorder moves a pen up or down to record changes. The chart paper is preprinted with a red line to indicate the top of normal deviation.

Interpreting the display

Ship's position and speed are presented in the usual format, as are the magnetometer and chart recorder's status.

The magnetometer records differences in the earth's magnetic field. Most of the *time,* these changes are small, and therefore below the red line. Sometimes, like when passing over a large metal object, or a large iron ore rock formation, this value will rise above the red line.

Unlike the sonar sensors and the platform, the magnetometer is streamlined; therefore, there is no maximum ship's speed when it is deployed.

Keys to press

To deploy the magnetometer, press D. This takes a certain amount of time. When you are finished with the magnetometer, press D to dock it. Pressing D while the magnetometer is deploying or docking will reverse its travel.

To start and stop the chart recorder, press C. If the magnetometer is not deployed, the recorder will simply show a flat-line display. Like the sonar chart recorders, the magnetometer chart recorder will keep moving even when you are not looking at this screen.

You can also change ship's speed and heading when looking at this screen, even though the screen does not say that you can do so. Use the usual keys to change heading and speed.

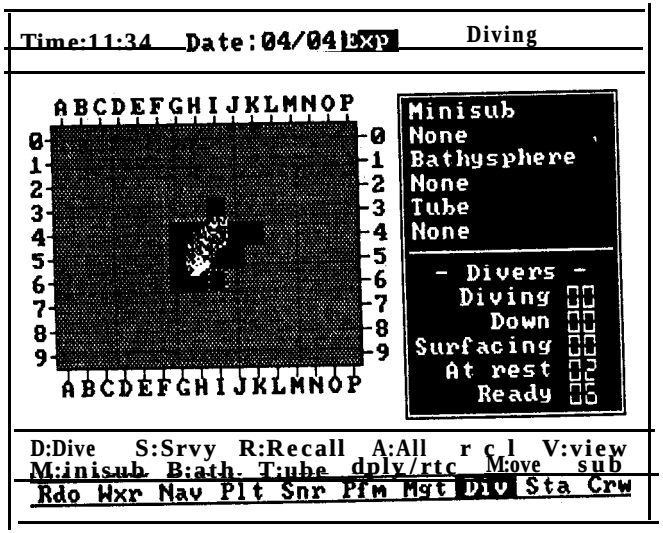
Div: The diving screen

NOTE: This screen appears only if you have hired divers.

Press 8 to call up this screen.

Note that there is a separate chapter devoted to the diving screen. Use this subsection merely for -key reference and screen overview.

Screen layout



The diving screen

On the left is a grid of points you may dive. On the right is a split window. The top shows the status of your minisub, bathysphere and suction tube. The bottom shows the status of your divers.

A flashing box shows the dive square you have selected.

interpreting the display

If divers are down, their position will be shown by a flashing dot in the appropriate dive square.

The status of your dive tools, the minisub, bathysphere and suction tube is shown in the upper section of the window.

The status of your divers is shown in the lower section of the window.

If you have surveyed a dive square, a map of what was found will appear on the dive map, and a pixel will be flagged on the piloting screen map. Every dive square here is represented by a single pixel on the piloting map.

Keys to press

Use the ↑, →, ↓, and +-keys to move the diving square cursor around on the dive map. If you try to move the cursor off the edge of the map, it will "wrap around" to the ot her side.

To deploy or dock the minisub, press M.

To deploy or dock the bathysphere, press B.

It is important to remember that "deploying" the minisub or bathysphere does not send them to the ocean floor. All the deploy operation does is prepare the vessel for the ocean and lower it into the water with its crane.

To survey an area, press S.

To dive an arca, press D. If a diver finds something, you will be told what it is, and if there is a picture for it, you will be askedifyouwish to view it. After finding something, a white dot will appear in the dive square where it was found.

To recall divers from a dive square, press R. The divers will immediately begin surfacing. If a storm threatens, you can press A to recall all divers.

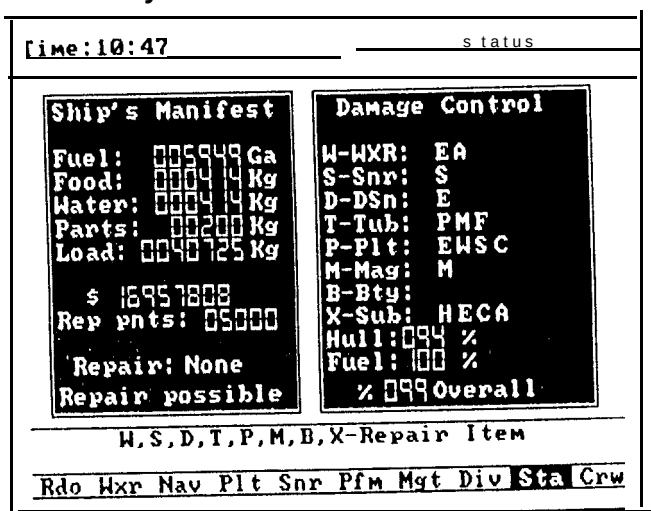
NOTE: When you enter this screen, your ship's speed drops to zero. Also, you can't move the ship when you have divers out; you'll have to press **A** *to recall all divers first.*

Spl: The supply/damage control screen

1 Rdo	2 Wxr	3 Nav	4 Plt	5 Snr	6 Pfm	7 Mag	8 Div	9 Spl	0 Crw

Press **9** to call up this screen.

Screen layout



The supply/damage control screen

There are two windows, left and right. The left window shows how much fuel, food, water, repair supplies and money you have. Also shown is what item is under repair (if any); you are also told if weather permits repair.

The right screen shows you the repair status of your equipment and ship. At the bottom is a number that shows overall how much damage everything has sustained.

Interpreting the screen

The fuel, food, water, repair, money and reputation indicators are all straightforward.

The damage control window has a line for each piece of equipment. Each piece of equipment has one or more component parts that can sustain damage. Each part is represented by a colored letter. The letter stands for what part is represented. The color shows how much damage has been sustained:

A part shown in *blue* is in perfect repair.
A part-shown in *red* has sustained some damage.
A part shown *white* is very damaged.
If the letter is not visible at all, that part has been dcstroycd.

The table below lists the pieces of equipment and what the individual letters represent.

Below the equipment indicators are the ship's hull and fuel tank indicators. The ship's hull number does not start out

Table 3-4 Damage control keys and abbreviations

Press to fix ↓ Abbr.	Full name	Components Abbr. ↓ Full name
W Wxr	Weather radar	E Electronics A Antenna
S Ssn	Ship's sonar	E Electronics /Sensor condition
D Dsn	Deep sonar	E Electronics/ Sensor condition
T Suc	Suction Tube	F Filter M Motor/pump P Pipe
P Pfm	Platform	E Electronics S Sonar C Camera W Winch
M Mag	Magnetometer	S Sensor E Electronics
B Bty	Bathysphere	S Sphere C Crane
X Msb	Minisub	H Hull A Robot arm C Crane E Electronics

at 100 percent, it starts out as the condition of the boat when you purchased it.

The fuel tank starts out at 100 percent, and only takes damage when the ship's hull integrity falls below 30 percent. If the fuel tank falls to 0 percent, you lose all your fuel.

Fortunately, the only way you can take damage is from weather (or sailing too fast with equipment dcploycd); so to avoid damage, avoid heavy storms.

Keys to press

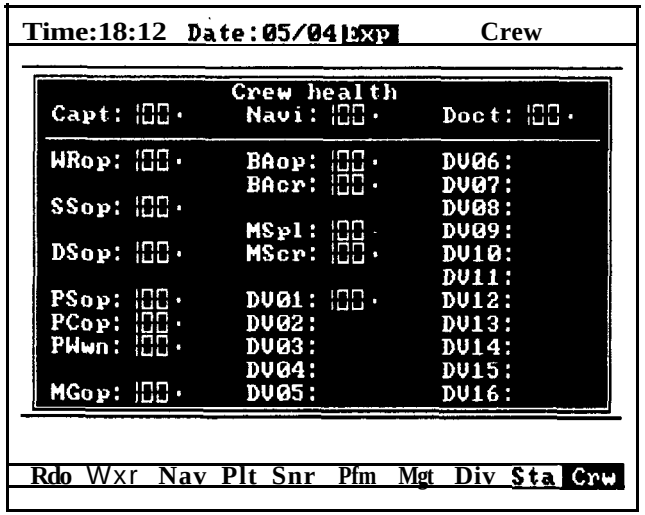
Press any one of the initials to begin repair on that item. You can only repair one item at a lime.

NOTE: Your ship stops rnoviug when you enter this screen.

Crw: Ttte crew health screen

Press 0 lo call up this screen.

Screen layout



The crew health screen

The large window shows all your staff. Beside each position, a percentage of perfect health, and a color indicator dot are shown.

Interpreting the display

Each person in your crew performs to the best he or she is able. As bad weather takes its toll, people perform less than perfectly. The color indicator next to the percentage functions the same as the colors in the supply screen:

Crewmen marked in *blue* are in perfect health.
Those marked in red are somewhat ill.
Crewmen marked in *white* are very ill.
Those marked in *black* are dead.

If the doctor is well, he will be able to heal people much faster than they would heal by themselves, but he can only heal one person at a time.

Keys to press

There are no key functions on this screen.

NOTE: Your ship stops moving where you enter this screen.

Crew reports

When you have wreck detection equipment active (the sonar, magnetometer, etc.), your technical operators always monitor them. On the piloting, sonar, platform and magnetometer screens, their report will appear as a varicolored asterisk enclosed in a red frame.

If there is no asterisk visible, their reports indicate that the probability of a wreck being in that area is very low. A *red* asterisk indicates that there is a low possibility of finding a wreck. If the asterisk is blue, there is more of a chance of finding something. Finding a wreck is almost certain if the asterisk is *white.*

This is a very effective way to locate a wreck. After deploying your equipment, you can sail a systematic search course on the piloting screen. Any evidence of a wreck will be reflected by the asterisk.

4 Diving

Diving on a wreck

Frankly, the whole point of the game is to dive. The whole point of all the grants is to get money. The money pays for the ships to travel to the ocean location, and for the equipment to find where to dive, not to mention salaries of all concerned, including the divers. All the Phase I planning and Phase II searching leads up to the final scene: the dives.

When you planned your expedition, you selected a few divers. At this point, you'd better hope that your choices were sound. Not only have you been paying those divers to sit around until you found the wreck, it's likely you will be letting them use your most expensive equipment during their dives.

This chapter assumes that you have successfully found a wreck with your sonar, platform or magnetometer. It's actually possible to find a wreck with divers only, and you will have to do it that way the first time. For how to do that, see the last section in this chapter, titled *Using divers alone to find a wreck.*

The dive screen

The dive screen is from where all divers are controlled. If you have the bathysphere, the suction tube, or the minisub, you will control them from this screen as well.

The dive screen display

The dive screen is divided into two sections: the dive map, and the status window. The dive map is on the left, surrounded by letters and numbers. The letters and numbers

are basically for your reference. When you have dived somewhere, you may want to write down where it was, as well as how long you were there.

The status window is on the right, and is further divided into two sections: equipment status (top), and diver status (bottom).

Dive map

The dive map is sixteen units wide, and ten units tall. Each unit across the top is labeled with a letter from A to P, and units down the side are labeled from 0 to 9. We call the units *dive squares,* and they represent an area about 136 feet on a side. Each unit is ten points on a side; there are 100 points in a unit. So, each point is 13.6 feet on a side.

Since the dive map is 16 by 10 dive squares, the map shows an area 2,200 feet wide, and 1,360 feet tall.

Somewhere in the dive map is a box cursor. This cursor will be described later. If any divers have descended, their positions are shown by small flashing dots.

If you have surveyed an area, the normally blue color on the dive square will change to reflect what was found on the ocean floor.

If you have found any objects, they will be shown as white points.

Status window

The status window has two sections. The top section displays the status of the minisub, the bathysphere and the suction tube. If you didn't get one of these items, the display shows None.

See the sections on each piece of equipment for details of each indicator.

Under the indicators for your equipment are the indicators for the divers. Each diver may be in one of five conditions; *At Rest, Diving, Down, Surfacing* and *Ready. See* the section on divers for a description of each of these conditions.

How to dive

The essence of the dive screen is simply this: You send divers down when they are ready, and then you wait until they are ready to dive again. The variations of water depth and usage of the minisub, bathysphere and suction tube-make it more complex.

Scuba diving

Scuba divers are divers who carry all their air with them. Each diver has three air tanks on his back. Each tank is filled with about 3,000 lbs. per square inch (about 190 atmospheres) of very finely filtered air (or Heliox (see the glossary under Bends)). For every 33 feet of water depth, pressure increases one atmosphere (15.7 lbs. per square inch).

A diver's air consumption increases in direct proportion to the depth at which he is diving. Therefore, the deeper a scuba diver descends, the less "air time" he has. The actual amount of bottom time a diver has is calculated by this simple equation: 90 min./atmospheres. For every atmosphere he descends, his air time is a half, then a third, a fourth, etc. of the 90 minutes his air would last at the surface.

Actually, the game does all this calculation for you, and when you send a diver down, it accurately calculates his dive time, down time, decompression and ascent time. This makes life a lot easier for you; all you need to do is press D or S, and everything is taken care of.

The maximum depth for a scuba diver in this game is 199 feet.

Diver's condition definitions

At Rest Basically, the diver is on leave. This is not a day off, however. The diver is undergoing a debriefing, but, more importantly, his body is slowly expelling any built-up nitrogen from his dive. Even though he may not feel the bends, for him to safely dive again, his body must expel

much of the nitrogen built up during the dive. See the glossary for more about the bends.

Diving On the way down. Remember that you can't send down a single diver. The buddy system is an inviolate code in this game. The divers descend at about one foot per second.

Down.... On the ocean floor. The diver is surveying or searching, depending on what you told him to do. He'll stay down as long as he can, and return at the proper time.

Surfacing On the way up. Divers ascend at a rate of about 60 feet per minute, plus decompression time.

Ready The diver is ready to go.

What happens when you dive and survey

Your divers spend time resting and going up and down, but the only really important time for divers is the time spent on the bottom. Some objects on the wreck area may be harder to find than others, and to find them, your divers must spend more time looking.

There are two reasons to send a diver down: the *dive* and the *survey*. A diver is sent on a survey by pressing S. When a diver surveys an area, he basically maps out the entire 130 by 130 foot area. Everything he thinks might be a part of a wreck is mapped out. When the survey diver returns to the surface, the results are displayed in the appropriate dive square. Regular ocean floor is displayed in black, while suspected wreck parts show up as pink.

You may survey any part of the ocean that is shown on the piloting screen (screen 4). But – and this is important to remember – when you return to navigation mode (by pressing **N** on the navigation screen (screen 3)), *all your survey maps are erased.* Do not return to navigation mode indiscriminately, and most importantly, if you *find a wreck, write down where it is.*

A diver is sent on a dive by pressing D. A diver on a dive goes down to search for objects. When he returns to the surface, you will get an alert if the diver found any objects, similar to this: "Diver found new objects at H7." This means you should move the dive square cursor to square H7, and press **V. V,** for View, lets you look at all the items in that square. See the subsection about viewing for more information about the **V** key.

Any objects that are found will be represented by a white dot on the dive map. The more divers you send down in a given square, the more likely objects will be found. Therefore, for better search accuracy, dive more that one team of divers on each square.

TIP: The more you dive a square, the *better your chances of finding out what is there. You will not necessarily find everything there is on the first dive.*

NOTE: Divers on a survey can stay down for as long as you want them to, *up to their maximum air and decompression time. However, for a dive to be successful, the divers* must *stay down for heir entire down time.*

The minisub

The minisub is a three-seater. For more information about the minisub, check out its glossary entry.

The minisub is a complex machine, and requires a lot of care. To use the minisub, follow this list:

1. You will, of course, need to own a minisub.
2. Before anything else, the minisub indicator must say **Docked.**
3. Press M between 6 and 8 a.m. (game time). This starts preparing the sub for the water, during which time the minisub indicator shows **Deploying.** During this stage, the batteries are charged; air tanks are tilled (tanks hold air sufficient for 8 hours); all seals are checked for leakage; the cameras, lights, and robot arm are tested; descent and ascent weights are mounted; and other minor tasks are performed. The total time for this procedure is from two to three hours. When completed, the minisub is in the water, ready to descend, and the indicator shows **Deployed.** If an emergency arises during the deploy operation, or while the sub is in the water *prior* to descending, you can pull the minisub back onto the ship by pressing M again.

4. Place the dive square cursor where you want the minisub to start its search and press D before noon (12:00 p.m.). This selects a diver from those available, and sends the sub on its trip down; the indicator now **shows Diving. In** the sub arc the diver that the game selected, the minisub pilot, and yourself. You can still control the game while you are in the minisub. When the sub reaches the ocean floor, it drops its descent weights and the indicator shows Down.

5. You can control where you want the minisub to explore while its indicator shows Down. Simply move the dive cursor to any dive square adjacent to the current sub position and press M. Keep in mind that it takes time for the minisub to travel across the ocean floor, and if you waste all your time moving around, you will not be performing the most efficient dive.

6. When the minisub has reached the point at which it must start up, it drops its ascent weights and the display shows **Surfacing.** It is important to remember that the minisub *will* be back on the surface by 7 p.m. (it automatically starts to surface at 5 p.m.), so the earlier you start out, the more use you will get out of the minisub.

7. When the minisub reaches the surface, it is automatically pulled back onto the ship, and the indicator shows **Retracting.** After the minisub is *on* the deck, it will be **Serviced.** By the time the minisub indicator reads **Docked,** it is about 9 p.m..

NOTE: You cannot move the *ship unless the minisub is docked.*

Minisub indicator definitions

None You don't have a minisub.

Docked Minisub on deck, bolted down. At this point, it is safe for you to move the ship around, or to deploy the minisub.

Deploying Minisub being readied for a dive. This covers the two hours it takes to prepare the sub for water, as well as the time it takes to lower the minisub into the water with its crane. Note the sub does not dive until you assign a diver to it.

Diving Minisub diving to the ocean floor. The sub descends at about one foot and a half per second, so a 10,000-foot dive will take 6,600 seconds, which is just less than two hours.

Down Minisub exploring the ocean floor. The minisub may explore the ocean floor for as much air as it has (minus ascent time), assuming you don't recall it, and assuming nothing goes wrong,

Surfacing Minisub on the way up. This also goes about one foot and a half per second.

Retracting Minisub being loaded onto the ship. This takes about an hour, and covers the time the sub surfaces and is reloaded onto the deck of the ship.

Servicing This is a highly variable time, and covers the time it takes to fix anything that broke, hose down the ship, and other activities.

The bathysphere

When you use a scuba diver in water deeper than about 100 feet, it becomes more efficient to use a bathysphere. Therefore, if the bathysphere is deployed, the first four divers you send down will use the bathysphere. Then the bathysphere descends, and the divers stay down for about eight hours, unless you recall them. Divers in the bathysphere can cover a 3x3-square area on the dive map.

NOTE: Unless the bathysphere is docked, you cannot move the ship. If you could, you would likely wreck the bathysphere and the ship.

Hcrc are step-by-step details on how to use the bathysphere.

1. You have to own a bathysphere, and it must be docked on the ship.

2. Press B to start deploying the bathysphere. This takes about half an hour and includes time to check the A/V connections, the first-aid kit, make sure that the air feed is clear and the air is pure. The sphere is then loaded up with a few filled air tanks for the divers to swap off with. Finally, everything must be battened down securely. The crane is attached, the mounting bolts arc removed, and the process of *lowering* the bathysphere into the water

begins. When the sphere is ready at sea level, the indicator will change to **Deployed.**

3. When you are ready to send the sphere to the bottom, you need to assign divers to it. Press **D** to send two divers and the bathysphere down. When the sphere is descending, the indicator will show **Diving;** when the sphere reaches the bottom, the indicator will show Down. YOU can send two more divers to the bathysphere by pressing D. Note that bathysphere divers can explore any area on the dive map.

4. The bathysphcrc can stay down a maximum of eight hours. If you want the divers to come back early, you can press **A** to recall all divers, or press R to recall only the divers from a certain dive square.

5. When the bathysphere is ascending, the display shows **Surfacing.** During the time for surfacing, the divers within seal the open doorway in the base of the sphere and begin the process of decompression, which may continue for some hours after the sphere is back on deck.

6. As soon as the sphere reaches the surface, it is automatically retracted onto the ship, when the status line shows **Retracting.** This takes another half hour or so.

7. After being fully retracted, the sphere must **be** serviced. The time taken for this basically amounts to the time for the divers within to decompress, plus a half hour or so. During this time, the indicator reads **Servicing.**

8. When the divers are finished decompressing, the indicator reads **Docked,** and the cycle of bathysphere dives can be started over again.

Following is a table showing all the indicators the bathysphere may show, and what they mean.

Bathysphere indicator definitions

None You don't have a bathysphere.

Docked Bathysphere on deck, bolted down. You can move the ship around safely, or deploy the bathysphere.

Deploying Bathysphere being prepared for a dive. This includes the half hour or so it takes to prepare the sphere for water, as well as the time it takes to lower the sphere into the water with the crane. Keep in mind the bathysphere does not dive until you assign divers to it.

Diving Bathysphere being lowered to the ocean floor. The sphere descends at about 50 feet a minute, to a maximum depth of 400 feet.

Down Bathysphere on the ocean floor. Divers looking around. Divers stay down for eight hours, unless you recall them.

Surfacing bathysphere are on the way up. The sphere also ascends at about 50 feet a minute.

Retracting Bathysphere being loaded onto the ship. This takes about half an hour, from the time the sphere surfaces to the time it is loaded onto the deck of the ship.

Servicing T h 'is is a highly variable time, and covers diver decompression, hosing the sphere down and other activities.

Suction tubes

The suction tube is basically a sand removal device. It helps your divers search wreck areas more efficiently. Divers using the suction tube are twice as efficient as their unaided counterparts.

Press **S** to deploy or retract the suction tube.

Suction tube indicator definitions

None You don't have a suction tube.

Retracted Suction tube loaded on board the ship, ready to transport.

Deploying Suction tube being set up for the use of the divers. This includes setting out the filter, lowering the pipe to the ocean floor and priming the pump.

Deployed Suction tube ready to be used by divers.

Retracting s UCt ion tube being pulled back into storage. Rinsing out the filter, coiling the pipe and greasing down the pump are included in this time.

The View key

When your dive square cursor is placed on an area of the map that has objects (indicated by white points), you can press **V** to see a list of those objects.

The list appears on a separate text screen. Every object that you have found so far is visible, and objects that are new in that square since you last viewed it are highlighted. Objects that have pictures associated with then are shown in blue (or highlighted blue), and have a letter next to the description.

Press ENTER to return to the dive screen, or – if there are viewable objects – press the initial letter. The program will then prompt for an additional disk (if needed) and display the picture for you, as well as showing the description at the bottom of the screen. Press ENTER to leave this screen for the object list.

If you have a CGA card, you can choose the false color display or the halftone display. Press the **D** key (for "Display"), to change viewing modes while you are viewing the image. Your display mode is remembered from image to image. Some images look best in false-color, while others look better dithered. Experiment with it.

Using divers alone to find a wreck

If you couldn't even afford ship's sonar, there still is a way to find wrecks, but it only works when the water depth is less than 200 feet.

Basically, you pick a spot on the piloting screen, go to the dive screen, and send a whole series of divers to survey the ocean floor, all in different squares. If you send them down in adjacent squares, you will have an efficient, albeit slow method of finding anything on the ocean floor.

Appendix A: Quick reference key table for Phase II

Implementation notes

throughout this guide, references are made to the ENTER, CTRL, ESC and ALT keys. Not all computers have these keys. Check the chart below to see which keys to press on your particular machine.

When this **guide reads** press:	ENTER	CTRL	ESC	ALT
PCs/compatibles	ENTER, RETURN, ↵	CTRL	ESC	ALT
Commodore 64/128	RETURN	C=	←	CTRL
Apple II	RETURN	Open Apple	ESC	CTRL
Amiga	RETURN	CTRL	ESC	ALT
Mac	RETURN	COMMAND	-	OPTION
Atari ST	RETURN	CONTROL	ESC	ALT

Additional **Commodore note:** The cursor control keys throughout this guide are labeled ↑↓→←. The Commodore cursor keys are labeled ⇑⇓⇒⇐. The key labeled ← above, substituting for the ESC key, is the left-arrow key at the upper left of the C-64 keyboard, not the cursor left key.

Program-wide keystrokes

ALT-W	Toggle time warp on/off
ALT-N	Sound on (normal)
ALT-Q	Alert bells only (quiet)
ALT-S	Sound on off (silent)
1 /F1	Radio
2 / F2	Weather
3 / F3	Navigation
4 /F4	Piloting
5 /F5	Sonar
6 /F6	Platform
7/F7	Magnetometer
8/F8	Diving
9/F9	Supply
10 / F10	Crew health
CTRL	Show screen numbers
ESC	Abort the game without saving

Radio screen

W	Request weather **report**
T	Call **tugboat**

S	Request emergency supplies
E	Emergency rescue required

Naviaation 'screen

+	Speed up time
-	Slow down time
S	Stop time (to normal)
↑↓→←	Change direction
E	Exploration mode
N	Navigation mode

Piloting screen

+	Speed up
-	Slow down
↑↓→←	Change direction (N, S, E, W only)
S	Stop moving

Sonar screen

D	Deploy/retract sensors
C	Start/stop chart recorders
+	Speed up
-	Slow down
↑↓→←	Change direction (N, S, E, W only)

Platform screen

D	Deploy/retract platform
C	Start/stop chart recorder
+	Speed up
-	Slow down
↑↓→←	Change direction (N, S, E, W only)

Magnetometer screen

D	Deploy/retract magnetometer
C	Start/stop chart recorder
+	Speed up
-	Slow down
↑↓→←	Change direction (N, S, E, W only)

Dive screen

D	Dive (order: bathysphere, minisub, Scuba)
S	Survey (same order)
↑↓→←	Move dive square cursor
R	Recall all divers from a square
A	Recall all divers
M	Deploy/dock minisub also move minisub
B	Deploy/dock bathysphere
T	Deploy/slow suction tube
V	View objects in area

View objects

ENTER	Return to Diving screen
(a-z)	Select an image for viewing

Viewing image

D	CGA only: Toggle false color/halftone
ENTER	Return to View Objects menu

Supply screen

W	Repair weather radar
S	Repair ship's sonar
D	Repair deep sonar
P	Repair platform
M	Repair magnetometer
B	Repair bathysphere
X	Repair minisub

Appendix B: Glossary

Bathysphere: A submergible chamber open at the bottom. When submerged, increasing air pressure keeps the water from rushing into the opening. Divers may base their exploration from the sphere, realizing a substantial savings in time, because they may return to air without decompression or ascension. When the divers return to the surface, the opening in the base of the sphere is sealed, and the sphere becomes a decompression chamber.

Bends: Decompression sickness; also called "caisson's disease." Decompression sickness in divers is caused by too rapid an ascent to the surface after having spent time underwater. Breathing air under pressure (i.e. the regulated air from a scuba tank) forces large quantities of nitrogen into the bloodstream. This nitrogen remains in solution in the blood as long as the pressure is maintained. If the pressure is suddenly released, as in the case of a diver ascending too rapidly to the surface, the nitrogen is forced out of solution throughout the body. The free nitrogen bubbles in the tissues and bloodstream cause a wide range of symptoms: pains in the joints, cramps, paralysis and eventual death unless the diver is treated promptly in a recompression chamber. Divers avoid getting the bends by carefully planning their dives and paying close attention to their ascent rates and decompression times. Fortunately for your divers, the program takes care of all of this for you.

Magnetometer: A device that senses variations in the Earth's magnetic field. The magnetometer in this game has two parts: a sensing apparatus (probe), shaped somewhat like a 6- foot-long artillery shell, and a chart recorder. The shape of the probe is primarily to reduce drag. The probe is held in position a distance above the ocean floor with a cable harness that returns to the ship and is attached to a winch. A delicate sensor inside the probe senses the minute variations in the Earth's magnetic field caused by the presence or absence of concentrations of ferrous metals. In this way, a magnetometer may be able to quickly detect a large chunk of metal (such as the Titanic) even when it has been buried by sand or coral.

Minisub: A submarine with very limited accommodations. The minisub in this game has a depth capacity of over 12,000 feet, and enough air to last for eight hours. When the minisub actually descends, you (rather, the you in the game) descend with it, and you run the ship (if you have to) by underwater telephone. The pilot you hired actually pilots the sub, and one of the divers you hired accompanies you both down to act as a third pair of eyes, and to operate the cameras and mechanical arm.

Sonar: A method for "seeing" objects in water by interpreting changes in sound waves reflected from objects. The ship's sonar used in this game

is a thirty-two sensor sonar. Every time the ship moves an increment of distance, the sensors all send out directional high-intensity pulses of sound, then begin to mark time very accurately. When a reflection returns to a sensor, the elapsed time is measured and sent to a computer. The longer it takes a pulse to return, the farther away the reflection occurred. The computer analyzes all thirty-two sensor times, removes what interference it can and plots the result on a four-color chart recorder.

The deep sonar in the game operates somewhat differently. It has only one sensor, and instead of waiting for the echoes to return on each position (which could take seconds, and throw the computer off), it sweeps across the width of the scan transmitting a variable frequency. Once the sweep has been made, the sensor returns to the beginning and listens. The sensor does not detect time clapscd, but instead listens for phase changes in the signal. Since the speed of sound in water varies with temperature, and water temperature varies a great deal in the ocean, the method of time calculation used by the surface sonar would bc unreliable. The sensor returns the signals it receives to a signal processor which can extract the image data, which is then printed out. Because a sweep method is used, absolute depth is not measured. Instead, as the sweep progresses, each point scanned will be higher, lower or the same height as the previous one. Therefore, the printout only shows changes in depth, not absolute depth.

Sonar/camera platform: An unmanned device for showing video and sonar images of the ocean floor. The platform in this game is shaped somewhat like a sled, but with heavy steel bars on all sides to protect it from accidental crashes. The sonar sensor is similar to the ship's sonar, in that it returns actual depth information. The video camera operates on a slow-scan method, which is why the monitor view is not always current. The platform is towed by the ship with a long cable on a winch. The information from the sonar and camera is returned via a small data wire integrated with the tow cable.

Suction tube: A device for removing sand and lightweight ocean floor debris without disturbing wreck remains. The suction tube in this game has three main parts: the motor (pump), the filter, and the tube. The motor basically pumps a steady flow of seawater from the pipe onto the filter. The filter is about 10 feet on a side, and is of a coarse mesh to allow sand to be returned to the ocean while filtering out any other objects. The pipe looks like a vacuum hose, and that's what it is. Basically, a diver points the pipe at a pile of sand, and it is sucked up through the pipe and onto the filter. If any objects are accidentally sucked up the filter stops them before they are swept away so they may be inspected.

Appendix C: List of wrecks

Wreck #	Ship name	X	Y	Depth
7	unknown	12590	3530	150
8	unknown	13040	3220	50
21	unknown	16378	2956	65
30	unknown	12739	3501	70
35	unknown	6520	10840	160
36	Cygent	4930	9550	100
45	Puerto Cristiana	8490	12130	50
49	unknown	13180	3530	90
58	unknown	13990	3240	100
70	unknown	12610	3540	60
79	unknown	15090	2850	68
83	unknown	13138	2824	60
84	unknown	12980	3350	80
93	unknown	12880	3220	57
98	unknown	14010	3240	70
107	unknown	14540	3320	90
108	unknown	14940	3290	50
112	unknown	14660	2730	37
121	unknown	14050	3100	45
120	Hopestar	7100	4000	4750
135	Ner a	13510	2250	325
151	Sealin g ship	9590	160	3900
152	Samke y	9600	5200	4170
166	Catharin a Duyvis	11820	2340	360
175	Michael Griffeth	10450	2240	980
179	Westland	11910	1870	390
180	Aspo	11630	1710	370
189	Salland	11790	2500	320
192	Spanis h flag ship	2380	8273	200
201	Ann & Marie	2440	7160	75
214	Penelope	3620	8400	40
223	Guipuscoa	2490	8200	70
229	Europa	350	5600	90
238	Trawling ship	9160	810	4670
242	Patty	2940	5890	80
251	Sancho Panza	167	5475	45
257	Harriet	165	5390	75
259	Sta. Maria dc Jesus	3972	7544	100
260	Comte De Durante	4640	8970	35

Wreck #	Ship name	X	Y	Depth
269	Richar d	4560	8080	5 5
273	unknown..	3000	8270	60
282	Carlos V	4140	7610	5 0
288	unknown (pirate)	1169	4111	56
297	Navigator	183	4441	34
310	Eagl e	4500	7820	3 5
319	unknown..	840	4090	60
322	Yewvalley..	11700	2310	240
331	Friendship	3782	4335	56
332	Andrew	4209	398 2	65
336	Sheldon.	10430	1760	345
345	Milford Viscount	10730	3080	760
359	Patache..	2358	8356	45
360	unknown..	4540	8160	80
373	Jupiter	4350	4020	105
382	Rodney..	4790	385 0	174
390	Hazard	4950	383 0	390
399	Charles	4717	3735	70
403	swan	3713	434 7	150
404	Adriana	3930	407 9	140
413	Liverpool..	4320	4010	67
418	Fly	2480	580 6	56
428	Titanic	7178	4124	12500
432	Lion	5398	3898	280
441	Adventure..	6720	3720	647
453	Neptune	2543	5709	67
462	Noah's ark..	2516	5701	48
466	unknown..	2000	4580	57
475	Naos	2740	489 0	70
476	Francis & Lucy..	2520	5780	40
481	Sero..	3329	464 8	56
490	Lydia	3784	439 5	76
503	Braddock	2938	4748	56
504	Bricole..	2999	4728	50
901	unknown	15190	3390	140
910	unknown	14120	3400	130
923	unknown..	16230	3140	110
924	unknown..	14740	3130	100

Appendix D: Winning the game

You may feel that finding the Titanic and viewing the digitized pictures of the wreck is ample enough reward for your efforts. However, there is another little detail that must be taken care of.

Your investors and creditors are interested in much more than pretty pictures from the bottom of the sea. They want more tangible proof that you have found the Titanic.

Somewhere amid the ruins of the ship there are three safes. In order for you to return to port a hero and an instant celebrity, you must first find the three safes. Only then can you claim your duly earned position as master wreck finder.

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