

SoftKey[®] presents...



CD-ROM for DOS

INTRODUCTION

Located 320 kilometers south of Guam, the Mariana Trench is home to the deepest place on earth, Challenger Deep, 11 kilometers (7 miles) straight down. That's two kilometers deeper than Mount Everest is tall.

In January of 1960, U.S. Navy Lt. Don Walsh and Swiss explorer Jacques Piccard made the first and only voyage to the bottom of Challenger Deep in the bathyscaphe *Treiste*. They returned to the surface with a window cracking from the pressure (16,000 pounds per square inch at that depth), received a hero's welcome, and made the cover of *Life Magazine*. But because the bathyscaphe could not move freely and explore, Walsh and Piccard had little to show for their efforts.

Today's submersibles, however (such as the U.S. Navy's *Alvin* and Japan's *Shinkai 6500*) are mobile and equipped with robotic arms capable of moving objects and taking samples. With these machines scientists have discovered a wealth of life living around deep-sea hot springs and cold seeps of natural gas down to 4,000 meters, and many scientists believe new forms of life are waiting to be found at even greater depths.

Discoveries of the Deep allows you to explore those depths at the helm of a simulated, high-tech minisub. You can undertake any of eleven important missions, from a nuclear waste site cleanup to a search for new life at the bottom of Romanche Gap, a trench in the Atlantic five miles deep. Hunt for the wreck of a treasure-laden Spanish galleon. Retrieve the "black box" from a downed airliner. See the *Titanic* first hand. Or just explore at your leisure, making your own discoveries in one of earth's last great frontiers, the sea.

PROGRAM REQUIREMENTS

MINIMUM SYSTEM REQUIREMENTS

Discoveries of the Deep CD-ROM requires the following minimum computer configuration:

- A 386 or higher IBM or fully compatible computer with 2 MB of RAM.
- About 602,112 bytes (588K) of free conventional memory and 1 MB of RAM configured as expanded memory.
- A VGA or better video card and monitor.
- A hard disk with approximately 11 megabytes free (4 megabytes permanent space).
- A CD-ROM drive.
- MS-DOS 5.0 or higher.

MEMORY

Probably the most common problem running games and other graphically complex software is lack of memory (RAM). It's possible that your system can have 16 MB of RAM and still fail to run Discoveries of the Deep. How? Programs that run under MS-DOS use your system's conventional memory, which, by design, is limited to 640K. Of that 640K, a certain amount must be free for use by Discoveries, in this case about 588K (or 602,112 bytes). Also, you must have at least 1 MB of free extended memory (XMS) configured as expanded memory (EMS).

To determine your system's memory resources, use the MS-DOS utility MEM. Typing MEM at the command prompt (followed by the Enter key) displays a memory use summary.

The line that reads "largest executable program size" refers to available conventional memory. This figure should be at least 602,112, equivalent to 588K, for Discoveries to run correctly. There are many techniques for freeing conventional memory, including disabling TSRs, loading MS-DOS into upper memory, and creating a **Boot Disk** (see **Making a Boot Disk** later in this section). Consult your MS-DOS manual before making any changes to your system.

The second memory concern is expanded memory (EMS). To access EMS memory, you must first configure your system for extended memory (XMS). XMS is accessed by installing **HIMEM.SYS**, a device included with MS-DOS. The HIMEM.SYS command must be installed in the first line of the CONFIG.SYS file. The format is as follows:

device=c:\dos\himem.sys

This device manages XMS memory. For more information on HIMEM.SYS and its options, consult your MS-DOS manual.

Next, you must have installed an XMS/EMS memory manager, such as the EMM386 manager that ships with MS-DOS. This device controls upper memory and allows XMS to simulate EMS. The command line for this device also resides in the CONFIG.SYS file and should read as follows:

device=c:\dos\emm386.sys

Adding this line will allocate EMS memory. For more information on EMM386 and editing your CONFIG.SYS file, consult your MS-DOS manual.

Don't guess when it comes to CONFIG.SYS!
Changing this file can have disastrous results. If you
aren't sure what to do, consult your operating
system documentation.

MAKING A BOOT DISK

If you feel uncomfortable modifying your system's configuration files or are unable to free enough conventional memory, you should create a **Boot Disk**. A Boot Disk is simply a floppy disk formatted with the MS-DOS system files, which allows your computer to boot without loading any device drivers (thereby freeing conventional memory).

To create a Boot Disk using the Boot Disk Program included with Discoveries of the Deep, do the following:

1. Install Discoveries of the Deep (see Installation).
2. Place a blank, formatted high-density floppy disk in the A drive. You must use the A drive; your computer cannot boot from the B drive.
3. At the system prompt, switch to the directory where you installed the Discoveries of the Deep program files.

Type **BOOTDISK** and press **Enter**.

When the process is finished, place the Boot Disk in the A drive and reset the computer. Starting the computer with a Floppy Boot Disk frees available memory but deactivates all device drivers. You should add to the boot disk any relevant files for your sound card, mouse, CD-ROM drive, and expanded memory to ensure support from these peripherals.

INSTALLATION

To start playing, follow these instructions:

1. Make sure your computer is on and that the DOS prompt is displayed on the screen. If you're running Microsoft Windows or a shell program, first exit that program.
2. Insert the Discoveries of the Deep CD into the CD-ROM drive. Switch to the CD-ROM drive. For example, type **d** and press **Enter**.
3. Type **install** and press **Enter**.

The Install Program will start. Follow the on-screen instructions. You will need about 11 megabytes of free hard drive space as the game is playing, but only 4 megabytes when the game is inactive.

When the files are finished copying, you must start the game from the directory on the hard drive where the files were installed. The startup command is **DOD**. To skip the Introduction and Credits screen, you may enter **disc** instead of **dod**, followed by the **Enter** Key.

TROUBLESHOOTING

Refer to this section if the program fails to start or run correctly after following the installation instructions. Here's a brief checklist you should go over before calling Customer Service:

1. Are the sound and music options configured correctly?

If your sound card wasn't listed during the Sound and Music configuration section of the Install Program, or the game locks when running with music, you should reconfigure the game to run with the computer's internal speaker (PC speaker). You can reconfigure at any time by leaving the game and, while in the directory where the program files are installed (on the hard drive), typing CONFIG and pressing **Enter**.

The Configuration Program will ask you to specify your sound options. Follow your responses with the Enter key. If you are using a SoundBlaster card, you may also change the base address and interrupt settings.

2. Do you have enough free conventional memory?

Discoveries of the Deep requires about 588K free conventional memory to run correctly. If the game locks or crashes unexpectedly, you may need to increase your available conventional memory (see Memory under the section, Program Requirements).

3. Do you have 1 MB of available expanded memory (EMS)?

Due to the amount and complexity of the graphics in Discoveries, you must have at least 1 MB of expanded memory in order to run the program. You may also want to modify your sound and music options, as they can affect the amount of available EMS memory (see **Memory** under the section, **Program Requirements**).

GENERAL FEATURES

Discoveries of the Deep has some common features that may be used throughout the game. These include mouse functions and built-in, on-line help.

USING A MOUSE

While a mouse is not required to play Discoveries, it is necessary for using the Recreation Room features and a small number of enhancements, and, in general, makes playing easier by reducing the need to memorize keyboard commands. If your mouse is properly installed, you'll see a pointer on the first screen after the introduction.

The pointer may change depending on where it is placed or the part of the game you are playing, but its function remains the same: simply position it over the object or instrument you wish to use. In general, the left mouse button applies the action. The right mouse button is used for help. All mouse commands are documented throughout the manual wherever appropriate.

ON-LINE HELP

If you need help remembering a command or need to review the game in general, you have two on-line choices: General Help and Local Help.

GENERAL HELP

Pressing the **F1 Key** opens the General Help feature, which is an on-line manual providing detailed information about game functions for the section you are playing.

To highlight a topic, use the Up and Down Arrow Keys; to view a topic, press the Space Bar. Once a topic has been viewed, it will not open again unless you highlight it, press the Space Bar (reverting the color to white), then press the Space Bar once more.

To leave General Help, press **Esc**.

LOCAL HELP

Press **H** or the **right mouse button** to see a list of commands related to a particular location. For example, pressing **H** while at the Manatee Harbor main office displays a list of keyboard commands for features available at the office. Pressing **H** while in the ship's pilothouse lists the keyboard commands available in the pilothouse, etc.

To close Local Help, press **H** or the **right mouse button** again.

LEAVING AND SAVING THE GAME

You can quit Discoveries of the Deep at any time during the game by pressing **Esc** (except at the Institute, where you must press **E** or click on the Exit sign with the mouse pointer). You will first be asked if you'd like to save the game, then you will be returned to the Quit Screen, where you'll have the choice of returning to the game or leaving.

When you leave the game you can opt to keep the temporary files created during game play or delete them. Keeping them will save time when restarting the game, as the information will not have to be reread from the CD-ROM drive. Keeping the files occupies about 11 megabytes of hard drive space while deleting them requires only 4 megabytes.

MANATEE HARBOR OCEANOGRAPHIC INSTITUTE

Welcome to Manatee Harbor
Oceanographic Institute



The **Manatee Harbor Oceanographic Institute** located in Miami, Florida, was established in 1977 as a research facility and a strategic launching point for expeditions to the Caribbean and Atlantic, and remains one of the most important facilities in the U.S. for the study of the seas. As a Manatee research trainee, your work takes you places most people can experience only in photos, from exotic coral reefs to deep sea trenches. Your specialty is manned submersibles, and the product of your team's efforts is *Manta*, a cutting-edge minisub utilizing the latest advances in ceramic hull design. *Manta* is fully mobile, equipped with a host of instruments and a robotic arm, and can carry a crew of three to depths up to 35,000 feet.

When you arrive at the institute, the first person you'll meet is D.L. Withers, the institute's director. He keeps a file cabinet near to keep track of institute activities and always seems to have enough work to keep everyone busy.



MANATEE HARBOR FUNCTIONS

CHOOSING A MISSION

(See page 53 for Special CD-ROM Missions.)

Director Withers has carefully chosen seven missions for you and laid their corresponding folders on his desk. They are.. from right to left:

The *Titanic*
Flight 19
The Mysterious Blue Hole of the Bahamas
Romarche Gap
Columbia Airlines Flight 609
The Spanish Treasure Galleon *Capitana*
Nuclear Waste Cleanup

Additional missions are available by pressing **M** (see page 53). While it's not necessary for you to accept a mission to begin exploring, doing so provides a clear objective and makes it easier to find your first site. Also, your performance during a mission is tracked and if you're successful, you'll receive a special certificate from Director Withers.

To open a mission folder, press **1-7** on the keyboard or click on one of the folders on Withers' desk using the mouse pointer. Each folder contains a brief description of the mission, mission objectives, and coordinates. To accept the mission, press **A** or click on its corresponding check mark with the mouse pointer; to reject the mission, press **R** or click on its check mark with the mouse pointer.

If you accepted a mission, the name of the mission will now be displayed on the screen above Wither's head. If you change your mind and wish to play a different mission, simply open the mission folder you desire and choose Accept. The new mission will replace the old.

To see all the missions listed simultaneously, press **M**. Use the **Up** and **Down Arrow Keys** to highlight a mission, followed by the **Space Bar** to select that mission. Press **Esc** to leave the List All Missions function. If you would like to know more about the missions, see the section later in the manual called **Mission Files**.

THE FILE CABINET

Opening the file cabinet near Withers' desk allows you access to the Slide Room and Log Notes, two features you'll want to use after completing your first excursion. To do this, press **F** on the keyboard or click on the file cabinet with the mouse pointer.

The File Cabinet Menu will open displaying four functions:
Slide Room, Log Notes, Certified? and **Return to Office.**

THE SLIDE ROOM

One of *Manta*'s best features is a high-speed camera allowing you to photograph anything you see from the main viewing window. The Slide Room is used for viewing the photos when you return.

After choosing Slide Room from the folder by pressing **S** or clicking the function button, you'll see the photos listed by name. To view a photo you must first select it by highlighting its name using the **Up** and **Down Arrow Keys**, then pressing the **Space Bar** (the name of the highlighted photo will turn green). When you're done choosing, press **Esc**. You'll see a message-SLIDE TIME. Press the **Space Bar**. Another message will appear asking you to dim the lights. Press the Space Bar again; the lights will go out and the first photo will appear. Continue pressing the Space Bar to advance to the next photo. After the last photo, you will be returned automatically to the office.

LOG NOTES

Open by pressing **L** or clicking the function button. Use this feature to review the ship's log after returning from a journey. All log entries are listed by name. To select an entry, use the **Up** and **Down Arrow Keys** followed by the **Space Bar** to read the log notes. Press **Esc** to close a log entry, and **Esc** again to return to the File Cabinet Menu.

CERTIFIED?

When you return from an expedition, select this feature by pressing **C** or clicking on the function button; you'll receive a brief report of your expedition results. If you completed a mission successfully, your name will be placed on a Manatee Harbor certificate. The certificate is graded depending upon how accurately the mission was conducted, with bonus ratings awarded for rescues at sea.

RETURN TO OFFICE

This will close the file cabinet. Press **R** or click on the function button.

SAILING

You can leave the institute and go to the dock any time you are standing in front of Director Withers by pressing **D** or moving the mouse pointer over the office window and clicking the left button.

EXIT

Clicking on the Exit sign or pressing **E** on the keyboard takes you to the Quit Screen, where you may leave the game or return to the office.

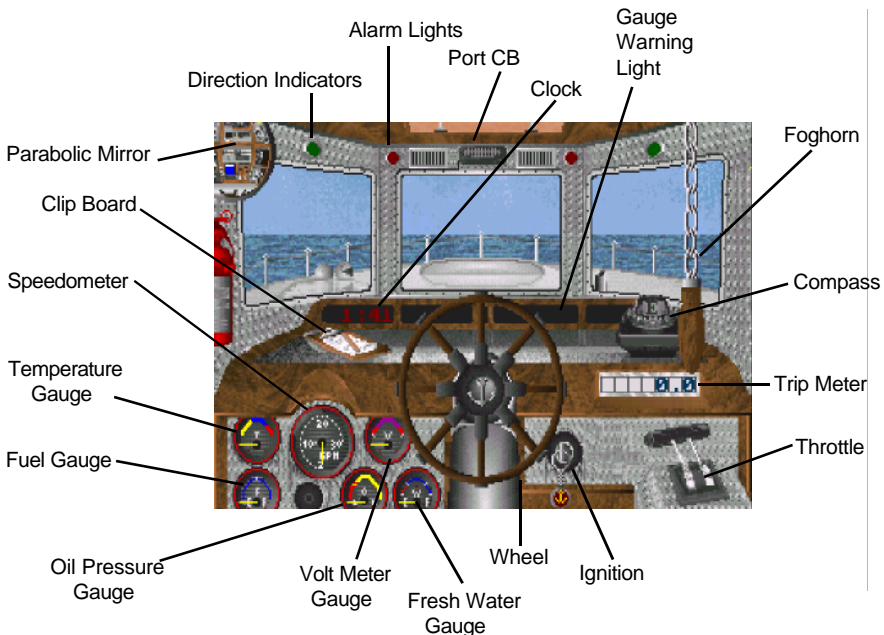
ABOARD THE SHIP

Two ships at Manatee Harbor are available for your use: the *Matacumbe*, and the *Voyager*. They are identical in size, capacity, and outfitting and differ only in the design of their pilothouses.

If you choose an odd-numbered mission, you'll embark on the *Voyager*, which has a perspective pilothouse window; if you select an even-numbered mission or choose to sail without a mission, you'll be using the *Matacumbe*, which has a flat pilothouse window. Both ships are in excellent condition and will perform equally well under the rigors of a long sea crossing.

THE PILOTHOUSE

After leaving the Institute, you'll find yourself in the pilothouse of either the *Matacumbe* or the *Voyager*. For illustration purposes, the *Voyager* is used here to show the layout of the pilothouse.



IGNITION

You'll need to shut off the ship's engines to go to a port and to launch the minisub.

To toggle the engines off and on, press **E** or click on the ignition slot with the mouse pointer. When starting the engines, the dashboard will light up, showing the gauge warning lights briefly, then go dark again. Also, you'll hear the engines start. You can confirm that the engines are running by looking at the key; it will be turned 45 degrees to the right (versus upright when the engines are off).

THROTTLE

Ship speed is controlled only with the keyboard. The **Up Arrow Key** increases speed, the **Down Arrow Key** reduces speed. Changes in speed are reflected by the Speedometer. Maximum speed for either vessel is about 30 knots.

If for some reason you approach land too quickly and are in danger of running aground, the ship's monitoring system will take over; the ship will slow and the engines will turn off.

WHEEL

Steering the ship is done with the **Left** and **Right Arrow Keys**. Any changes in direction are reflected by the compass.

Because your direction will be determined by your destination, it's a good idea to monitor the NavMap frequently when you're sailing (see **Navigational Map**).

GAUGES

The pilothouse is equipped with six gauges associated with the mechanical aspects of the ship: Speed (in knots), Temperature, Fuel, Oil Pressure, Voltmeter, and Fresh Water Level. All gauges except the speedometer have their own warning light that will come on in the event of a problem.

In an emergency, the ship's monitoring system will activate an Automatic Shutdown to prevent damaging the ship (see **Automatic Shutdown**).

TRIP METER

Keeps track of the total distance traveled in miles. Any time you port, the meter resets to zero.

CLOCK

Displays the current time.

COMPASS

Displays the ship's current general direction -- N, NE, E, SE, S, SW, W, or NW.

DIRECTION INDICATORS

The two round, green lights at the top of each corner of the pilot house windows each display a direction arrow when you turn the wheel.

ALARM LIGHTS

Near the Direction Indicators above the pilothouse windows are two red alarm lights. When these flash, check the Teletype in the Instrument Room on Channel I for messages.

FOGHORN

Sounds the ship's foghorn. Click on the foghorn with the mouse pointer.

PORT CB

The Port CB above the center window has a warning light to notify you of incoming messages. When it turns green, click on it with the mouse pointer or use the Instrument Room radio to hear the message.

PARABOLIC MIRROR

Clicking on the mirror in the upper left of the screen with the mouse pointer or pressing **I** takes you to the Instrument Room (see **Instrument Room**).

CLIPBOARD

Click on the Clipboard or press **C** to use the ship's log.

When the Clipboard opens, press **S** to start a log. Logs are indexed by time and date started. After opening a log, you can begin journal entries by pressing **R** or clicking on the **Resume Log Notes** button. From there, press **A** to make a log addition or **R** to review previous log notes. Press **Esc** to leave the Add and Review functions, then **Q** to return to the Clipboard screen. To leave the Clipboard, press **E** or click on the **Exit Clipboard** button.

PORTING

Any time the ship needs to resupply or refuel, it's time to seek the nearest port.

The first step is to locate a port of call in the Instrument Room (see **Instrument Room**) and set course accordingly. Hopefully, you'll have enough fuel and supplies to reach it safely.

When you're within a half mile of the port (it will say 'Port' on the Nav Map data), stand in the pilothouse and press **P** or click on the Port CB. Your ship and supplies will be refreshed, or, if you're at home port (Miami, Florida), you'll return to the Institute.

MONITORING SYSTEM

Both ships have a built-in monitoring system to warn you of impending danger. Any time you see an Alert Light flashing, check the Teletype on Channel 1 for messages.

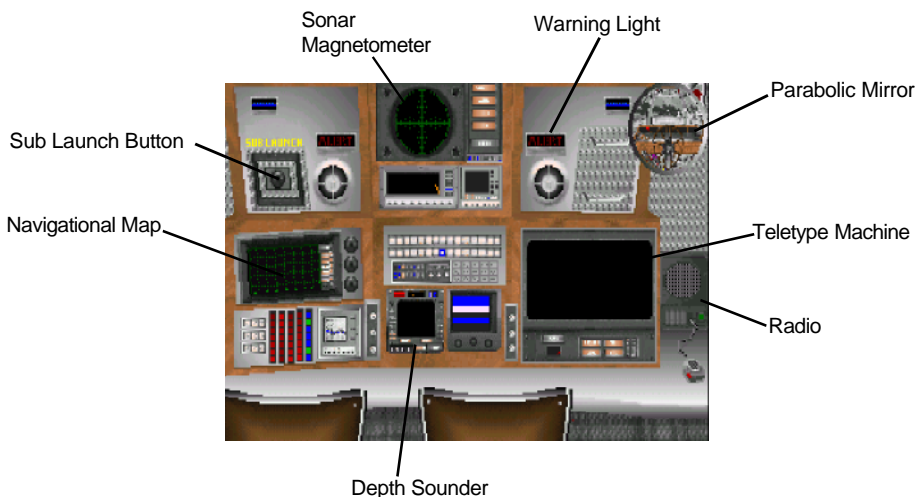
AUTOMATIC SHUTDOWN

If the ship experiences a mechanical failure, runs out of fuel, or is in danger of running aground (a distance of less than 2/10ths of a mile from a land mass) an Automatic Shutdown will follow. If this occurs, go to the Instrument Room and send a distress call (in Plotter mode, press Restore), then return to the pilothouse and check for the arrival of a ship. If you see a ship, continue sending the distress call until help is received.

THE INSTRUMENT ROOM

The oceans are vast, covering about 75% of the earth's surface, and locating an object even the size of the *Titanic* would be nearly impossible without the aid of modern electronic instruments.

From the pilothouse, click on the mirror in the upper left of the screen with the mouse pointer or press 1 on the keyboard to go to the ship's Instrument Room. Five instruments are at your disposal:



THE NAVIGATIONAL MAP

Called NavMap for short, this is the most-used and most important of the instruments. To operate it, press **N** or click on it with the mouse pointer.

Primarily, the NavMap displays your global position, allowing you a "satellite" view of your ship's position in the Atlantic. It is in this view that you will probably do most of your sailing, as it easily lets you see when you are approaching a land mass, port, or dive site.

NavMap functions are as follows:

EXIT	Returns you to the large view of the Instrument Room. Press E or click on the button.
LAND	Overlays an outline of land masses in the Atlantic and activates a radar sweep. Toggle by pressing L or clicking on the button.
WEATHER	Overlays current weather patterns. Toggle by pressing W or clicking on the button.
DATA	Overlays distance from the nearest land mass 225 miles away or less. Toggle by pressing D or clicking on the button.
BEARING	Overlays latitude, longitude, and heading. Toggle by pressing B or clicking on the button.
COLOR	Cycles the land outline and the radar sweep through one of four different color combinations. Toggle by pressing K or clicking the button.
P/D	Displays all available ports of call. Toggle by pressing S or clicking the button.

PLOTTER

Press **P** or click on the button; a red light beside the button indicates the plotter is on.

Activating the plotter allows you to sail from the NavMap view using the arrow keys (Arrow keys normally function only in Pilothouse view). Instead of acting as forward and reverse throttle, however, the **Up** and **Down Arrow Keys** move the ship, literally, up and down on the map; equally, the **Left** and **Right Arrow Keys** move the ship left and right on the map.

You'll notice the ship moves considerably faster in plotter mode than during normal sailing (or "real time"). This will save you a great deal of time in getting to your destination. Speed can be further increased by using number keys 1-4. Pressing 1-3 increases the distance the ship jumps per key press when you're under 225 miles from a land mass (1 equals smaller increments, 3 larger); pressing 4 works only outside of 225 miles (Data function will display message, "No Current Data") and will increase ship movements 102 miles per key press.

It's important to remember that while in plotter mode ship resources are calculated for the distance traveled. For example, you can sail in plotter mode to a port in Spain, return to the Pilot house and see that you're nearly out of fuel. However, those resources will not actually be deducted until you press **Go** (see **GO**).

- RESTORE** If you've moved the ship in plotter mode to a destination and change your mind, pressing **R** will return you to the last point **Go** was pressed (or **Miami** if **Go** had not yet been pressed) and restore your ship's resources.
- Restore is also necessary if you move the ship in plotter mode and experience an automatic shutdown (though not actually deducted until pressing **Go**, ship resources such as fuel loss are calculated in plotter mode, and can result in an automatic shutdown). Press **R** or click on the button and the ship's position and resources will be restored to the last point where **Go** was pressed (or **Miami**).
- GO** In plotter mode, deducts calculated resources from the last position before **Go** was pressed (or **Miami**) and turns plotter mode off. Press **G** or click on the button.
- CLEAR** Deactivates all active NavMap functions simultaneously. Press **C** or click on the button.

Because of the close relationship between the NavMap and the Pilothouse, special keystrokes have been assigned to take you directly from the Pilothouse view to the NavMap view. From the Pilothouse, press **T** to go to the NavMap; from the NavMap, press **F** to return to the Pilothouse.

SONAR-MAGNETOMETER

Also called the SonMag, this instrument functions as both a search light sonar and a magnetic anomaly detector (magnetometer).

Sonar will check for the presence of any major objects both vertically and horizontally.

The Magnetometer detects one of the following characteristics: 1) A high concentration of magnetic ore in the ocean floor sediment; 2) A magnetic anomaly or diametrically opposed magnetic field such as is found at ocean ridges; or 3) a concentration of metal or magnetic rock.

SonMag functions are as follows:

SONAR	Activates sonar. Effective sounding range is 30 miles. Toggle by pressing S or clicking on the button.
MAG	Starts a magnetometer paper reading. High peaks in the reading indicate an anomaly. Press M or click on the button. Switch to Sonar mode to deactivate.
DATA	Overlays data relevant to either the Sonar or the Magnetometer, depending upon which mode you are using. Press D or click on the button.

In Sonar mode, Data tells you: latitude, distance from a land mass, longitude, and four compass points-N,S,E, and W.

In Magnetometer mode, Data tells you: positive gamma (indicating the maximum range of the magnetic anomaly), latitude range of the attempted reading, longitude range of the attempted reading, and negative (-) gamma (the lowest range of the magnetic anomaly). It isn't necessary to monitor or understand gamma readings to find an object; just look for big fluctuations in the graph.

- COLOR** Changes the color of Sonar sweeps. Cycle through the colors by pressing **C** or clicking on the button.
- EXIT** Leaves the SonMag and restores the large view of the Instrument Room. Press **E** or click on the button.

THE TELETYPE

The Teletype gives you printed messages from two sources: 1) The ship's monitoring system, and 2) Outside radio messages from ports or other vessels. You can also send a prepared distress signal from the teletype to try and get help or recover from an Automatic Shutdown.

The buttons on the teletype are:

- RECEIVE** Plays any pending audio messages from the outside world. To use, press **R** or click on the button. When the green light is lit, a message is pending.
- SEND** Transmits a standard distress signal on a standard frequency. Use this when you are stranded and need to recover from an Automatic Shutdown or need to perform a rescue. To use, press **S** or click on the button, then switch to Channel 1 (the ship's Monitoring System) for messages on ship status. Check the Pilothouse frequently for the presence of outside ships.
- CH 1** Channel 1 contains messages-usually warnings-generated by the ship's own Monitoring System. Press **1** to activate this channel.

CH 2 Channel 2 is used for receiving outside transmissions, usually port messages. Most transmissions are accompanied by an audio radio message (see Radio). Press **2** to activate this channel.

EXIT Restores large view of Instrument Room. Press **E** or click on the button.

DEPTH SOUNDER

Use this instrument to measure the depth at a site. This could be especially useful for locating trenches.

The Depth Sounder functions are as follows:

READING Triggers a reading. Use this before the Color and Graph functions. While reading, the orange dots in the small center window above the readout will "swim". If the Sounder is confused by the bottom topography, activate it again and it will return its best estimate. To use, press **R** or click on the button.

COLOR Displays changes in depth through a multi-colored band (brown, red, and green). The wider the color band, the deeper the area (and vice-versa). Press **C** or click on the button after taking a reading.

GRAPH A visual indication of the shallowness (top line) and deepness (bottom line) of the area. Magnitude is emphasized by the vertical length of the lines. Press **G** or click on the button after taking a reading.

DATA

Overlays the following information from top to bottom: latitude and longitude, maximum depth in fathoms in a radius of fifteen miles, depth in feet right below the ship, and minimum depth in fathoms in a radius of fifteen miles. Toggle by pressing **D** or clicking the Data button.

EXIT

Returns you to a full view of the Instrument Room. Press **E** or click on the Exit button.

RADIO

The radio is a quick way to get audio-only messages from outside sources. Just press **R** on the keyboard or click on the radio with the mouse pointer when the green light is on.

SUBLAUNCH

Click on the Sub Launch Button or press **L** when you're at a site and ready to dive. The ship's engines must be off.

THE RECREATION ROOM

The Recreation Room is a handy way to visually record the location of sites you've been to and, if you have the time, to relax with a game of Darts or Tank. To enter the Recreation Room, press **R** from the Pilot-house. To leave the Map Room, press **Esc**.

NOTE: Use of the Recreation Room is not necessary to play or complete Discoveries. A mouse is needed for some key functions.

THE WALL MAP

In addition to the NavMap, the Wall Map on the right side of the Recreation Room screen displays the available regions of exploration. To use the map, press **3** or click anywhere on the map with the mouse pointer.

In Discoveries of the Deep, you may explore from 0 to 70 degrees north latitude to 0 to 80 degrees west longitude. The Wall Map allows you to pin flags on any sites of interest you may wish to mark. For example, if you discover a sunken fishing boat at 25 degrees latitude, 40 degrees longitude, you can place a green flag at the approximate position on the map and enter in the log: "Sunken fisher at green flag."

Flags may be deleted only in the order they were placed by clicking on the **DEL** icon (last flag placed will be the first flag deleted).

To leave the Wall Map, click on the **Arrow** icon at the bottom left of the screen or press **Esc**.

DARTS

A favorite shipboard diversion, darts are a fun way to pass the time on long sea voyages. To play a game, click on the dartboard with the mouse pointer or press **2**.



To throw a dart, click on **THROW** and move the mouse pointer to your target on the dartboard. A crosshair will appear. Press the left mouse button again and a red bar graph will start moving up and down in the Vertical Targeting Bar to the right of the board. Try to stop the bar as close as possible to the yellow center band by pressing the left mouse button again.

The Horizontal Targeting Bar will now activate; again, try to stop the moving bar on the yellow target line by pressing the left mouse button. The closer you are to the yellow lines, the more accurate your shot. A score for each shot is posted in the Score Box in the upper left portion of the screen.

After throwing three darts, you can shoot again by clicking the **NEXT** box. To leave the dart game, click **QUIT** or press **Esc**.

TANK

Click on the arcade machine next to the dartboard to play Tank. You'll be at the controls of a futuristic tank on a three-dimensional battlefield.



To move the tank, use the **Up, Down, Left, and Right Arrow Keys**. Pay attention to the Targeting Computer in the upper right of the screen; obstacles will appear in orbit around your tank, which is represented by the dot in the center of the Computer. When the green light flashes in the upper left of the screen, a target is dead ahead. Use the Space Bar to fire the cannon.

To see an overhead view of the playing boundary, press **M**; to leave the overhead view, press **Esc**.

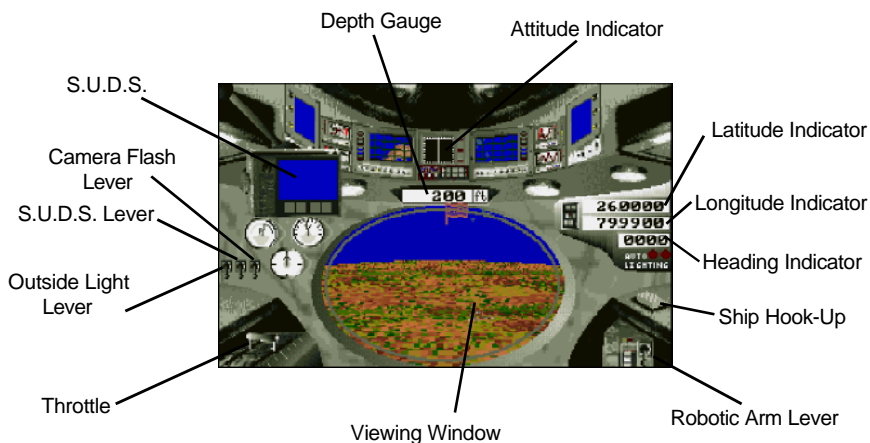
To exit Tank, press **Esc**.

PILOTING THE MINISUB

Once you've maneuvered the ship over the dive area, the next step is to launch *Manta*, the minisub. Before launching, shut off the ship's engines and go to the Instrument Room by pressing **I** from the Pilothouse or clicking on the mirror with the mouse pointer.

LAUNCHING

Once in the Instrument Room, press **L** or click on the **Sub Launch Button** in the upper left of the screen. The sub will be lowered into the sea and you'll be seated at *Manta*'s helm, ready to dive.



Manta represents the latest in submarine technology, employing a ceramic hull (to resist great pressures) and computerized instruments and attitude control. If it's your first time using *Manta*, take a moment to familiarize yourself with your surroundings and the controls.

THE VIEWING WINDOW

This is the minisub's main viewing port. Although *Manta* has some upper windows as well, the best view of your surroundings will be here.

THROTTLE

Manta's throttle control is located on the lower left of the screen. To start moving forward or increase speed, press F on the keyboard; to slow down, press **B**. Repeatedly pressing B will cause *Manta* to move backward, so be careful not to back up too fast or you may run into something and damage the sub. The **S** key will bring *Manta* to a full stop and reset the attitude to neutral (see **Attitude Control**).

Two other commands related to throttle are the **Z** and **X** keys. Covering large distances in a slow-moving minisub can be time consuming, so *Manta* was given a double speed feature. Each time **Z** is pressed on the keyboard (for ZOOM), *Manta*'s previous forward speed will double; pressing X (for XOOM) does the opposite—*Manta*'s previous speed will be halved. While this can be very useful, it's possible to go so fast that you can ZOOM past your target.

Throttle controls are not available with the mouse.

ATTITUDE CONTROL

Once the minisub is moving, piloting it is somewhat like using the control stick of an airplane; you push the stick forward to make the nose dive, pull it back to make it climb; pulling the stick left or right causes the minisub to bank in either direction. Instead of a control stick, however, you will be using the arrow keys. Pressing the **Up Arrow** causes the sub's nose to dive; the **Down Arrow** causes it to rise; the **Left** and **Right** arrows cause it to bank left or right. Anytime you press the arrow keys while the sub is moving (either forward or backward), you change its angle of movement—or attitude. If you feel at any time that you are losing control of the sub, press the **S** key; the sub will come to a full stop and the attitude will reset to neutral (the sub is neither climbing nor diving, nor banking in any direction).

All changes in attitude are displayed on the Attitude Indicator located above the depth gauge. The indicator shows two lines - one horizontal, one vertical-that move in tandem with the sub's movements.

When the horizontal bar rises, the sub is descending; when it lowers, the sub is climbing. When the vertical bar moves left, the sub is turning right; when it moves right, the sub is banking to the left.

If you have a mouse, clicking the left button while the cursor is over the attitude indicator will reset the sub's attitude to neutral, but without stopping the sub's forward or backward motion.

DEPTH GAUGE

This is the display window located directly above the viewing window. The figure indicates how far the minisub is below the ocean's surface.

LATITUDE INDICATOR

Displays your north or south latitude.

LONGITUDE INDICATOR

Display your east or west longitude.

HEADING INDICATOR

Displays your heading. A heading of 0 indicates you are traveling due north; a heading of 90, due east; a heading of 180, due south; and a heading of 270, due west.

OUTSIDE LIGHT

To see outside the sub at lower depths, turn on the outside light by pressing **L** on the keyboard or placing the mouse pointer over the Outside Light Lever and clicking the left mouse button.

S.U.D.S.

S.U.D.S. stands for Simple Underwater Detection System. This useful piece of equipment can detect objects underwater. When turned on by activating the S.U.D.S. lever, a line appears across the display. If you're lucky enough to be in an area near a site, a blip will show on the line. Simply follow the blip left or right as indicated and the sub will home in on objects of sufficient size or density. When the blip is below the line, the detected object is behind the sub.

S.U.D.S. may be activated and deactivated by pressing the U key or placing the mouse pointer over the S.U.D.S. lever and clicking the left mouse button.

TAKING PICTURES

Documenting your expedition is one of your highest priorities, so *Manta* is equipped with a high-performance digital camera and a strobe light. To photograph anything you see in the viewing window press **P** (there is no mouse command). You'll be asked to name the photo; type the name and press **Enter**.

After returning from your mission, you can view your snapshots in Manatee Harbor's slide room.

TECHNICAL NOTE: *Manta* takes photographs digitally, meaning they are transferred directly to an onboard computer disk rather than film. This lets you take more pictures and see them immediately upon your return to the Institute (no photo processing is required). The pictures are saved as data files with a CAM extension.

CAMERA FLASH

This switch disables the strobing of the outside light when taking pictures. This is used mainly for taking photos as you see them rather than in full color under the strobe light. One picture in each mode will give you an interesting comparison.

THE ROBOT ARM

The robotic arm will be needed at some of the mission sites. Due to the amount of power consumed by the arm, some of the instruments and the outside light, if it is on, must be turned off. This will be done automatically and the instruments will be restored after the an-n has retracted, but the outside light may have to be switched on again manually.

The arm extends and retracts to the same point in front of the sub each time it is activated. To determine where the arm will extend, a targeting crosshair is displayed before the arm is actually deployed. To bring up the crosshair, press **A** on the keyboard or position the mouse pointer over the Robotic Arm Lever (located on the lower right of the screen) and click the left mouse button.

Once the crosshair is active, move the sub into position so that the object to be sampled is directly in front of the crosshair; press **A** again (or click on the lever using the mouse) to deploy the arm and take a sample.

SUB DAMAGE

Deep diving is dangerous work, even in the relative safety of the minisub. Although *Manta* has an advanced hull design capable of resisting great pressure, enough collisions can compromise its water seals and other less durable components. Each collision with a large object (or the sea bed) will incur a small percentage of damage. You'll receive a warning when the damage is sufficient that you should return to the ship for repairs. If you ignore it, you'll receive three more warnings, depending on damage level, before the sub hull is compromised. After that, you'll visit one last site—Davy Jones's locker.

TIME LIMITS

You can't stay underwater indefinitely in the sub -- sooner or later you'll run out of power or air. To check the remaining operating time while in the sub, press **T**. Don't forget to check regularly.

MOUSE INFORMATION

If you're using a mouse with Discoveries of the Deep, you can receive information about minisub instruments and objects outside the viewing window by clicking on the object or instrument using the right mouse button.

RECONNECTING WITH THE SHIP

When you go diving in the minisub, the first mate takes the helm and, with the help of a technician in the instrument room, follows your movements aboard ship. By keeping the ship near the minisub, you can easily return simply by surfacing. The ship will be near to hook the sub and bring you aboard.

When you've ascended to less than 20 feet, press **C** on the keyboard or click on the Ship Hook-Up Button using the mouse. You'll be ready to sail to a port or your next destination.

The *Titanic*

It was nearly midnight when the lookouts saw the shape forming in the haze, towering 60 feet above the water. Sounding the warning bell, they telephoned the bridge:

"Iceberg right ahead!"

The first officer called a hard-a-starboard to the helmsman and ordered a full stop. Working quickly, lie activated a lever that closed the watertight doors below the waterline while the helmsman spun the wheel as far as it would go. The great ship veered to port, but too slowly; the iceberg struck her starboard bow, scraping along the hull, and moved silently into the night.

The impact tore a gash in the hull, jarring the crew in the forward section yet scarcely disturbing the passengers, most of whom were inside because of the cold air. After ten minutes, water rose 14 feet above the keel and the first five compartments began flooding. One of the boiler rooms was eight feet under water, Captain Edward J. Smith and one of the ship's chief engineers ran a rapid inspection below decks and discovered the mail room filling with water, sacks of mail floating in the advancing sea. The worst was apparent: the ship was going down.

The captain had no time to cast blame for mistakes. Lifeboat space for the estimated 2,200 passengers was only 1,178 and he knew more than 1,000 would have to stay behind. He had an hour, perhaps two, to complete the orderly evacuation of the ship and delay the inevitable panic as long as possible.

A standard SOS distress call was sent out, and later the new distress signal, SOS, which was just coming into use. The *Californian*, 19 miles to the north, failed to respond. Numerous other ships heard and answered the call, the next closest the *Carpathia*, some 58 miles southeast. Her captain, Arthur Rostron, could scarcely believe the news but turned his ship full steam and raced to the rescue.

The officers began loading women and children into the lifeboats. Many of the passengers were reluctant to leave, but the firing of the distress rockets seemed to bring them to the realization that the ship was in trouble. Just inside the Boat Deck entrance the ship's band continued playing lively tunes.

As the slant of the deck grew steeper, the lifeboats began leaving more quickly and more fully loaded. Down in the engine room, the chief engineer and some of his crew stayed working the boilers to keep the lights on and the pumps going.

Soon, all the boats were gone, the ship was well underwater, and over 1,500 people remained aboard. Clinging to the rails as the ship tilted violently, many plunged into the icy sea but were sucked down by the pull of the ship.

At 2:18 a.m., April 15, 1912, the ship's lights blinked once, then went out, and the R.M.S. *Titanic*, the greatest ship of her day, slipped below the sea.

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When she sailed on her maiden voyage in 1912, the *Titanic* was the largest and most elegant liner in the world. Eight hundred eighty-two feet long, a hundred feet high at the bridge, and weighing over 46,000 gross tons, she was the last word in floating luxury. The first-class suites were over 50 feet long and included a private promenade deck. There were elevators; a gymnasium; a Turkish bath and swimming pool; an a la carte restaurant; the Cafe Parisien, a replica of a Paris sidewalk cafe and a lavish Grand Staircase. The first-class passengers were the cream of society, and included the wealthy Colonel John Jacob Astor, Benjamin Guggenheim, and Isidor Straus (the owner of Macy's) and his wife Ida.

The actual sinking of the ship has been recreated by Dr. Robert Ballard of the Woods Hole Oceanographic Institution. A likely scenario based on a study of the evidence indicates that at about 2:17 a.m. (the ship by this time was well down at the bow) flooding increased rapidly and the ship lurched downward. The wave of water coming over the bow collapsed the bridge and the officers' quarters; the number 1 funnel toppled forward.

As the stem continued to rise, stress on the midsection increased; the hull broke in two between the third and fourth funnel and the bow tore away, racing toward the ocean bottom and dragging with it a mass of debris-boilers, pieces of the hull, funnels, etc. The stem leveled somewhat, then pointed straight up under the weight of the engines, pivoting as it did so; it stayed this way a minute or more before plunging. As it sank, the force of rushing water peeled back the Poop Deck.

As the stern dropped more or less straight down, the bow planed away at a shallow angle, plowing into the sea bed. By the time all the pieces had settled, the stem lay 1,970 feet from the bow, facing the opposite direction.

While the *Titanic* is open for exploration, the wreck site is also a burial ground and stands as a memorial to all who went down with the ship. You will be limited to viewing the wreckage and taking pictures.

Flight 19

December, 1945, 2: 10 p.m. Five Avenger torpedo bombers lifted off from the Naval Air Station in Fort Lauderdale, Florida, scheduled for a routine patrol in the Atlantic-160 miles east, 40 miles north, and 120 miles back to base. The planes were fully fueled and all equipment was in good working order; the pilots and crewmen were all experienced; the weather was excellent. Flight 19 was scheduled to last two hours.

At 3:45 p.m. the first message came from the patrol. The tower, expecting to receive a request for landing instructions, instead received:

"Control tower, this is an emergency. We seem to be off course. We cannot see land ... repeat ... we cannot see land."

"What is your position?" the tower asked.

"We're not sure."

Perplexed, the tower operators instructed the patrol to head due west. After a long silence, the patrol leader answered, "We don't know which way is west. Everything is wrong ... strange ... we can't be sure of any direction."

The tower operators were at a loss. The planes were equipped with extensive radio gear, compasses and homing devices which showed the heading to take to return to base. Even if the compasses were affected by a magnetic storm, the pilots should have been able to find land by flying toward the sun. It seemed as if they couldn't tell where the sun was.

As time passed, the pilots grew confused and scared, but stayed together. After 4:00 p.m. the planes were running low on fuel and the situation was grave.

At 4:25 the flight leader radioed the tower: "We're not certain where we are. We must be about 225 miles northeast of base ... it looks like we're. . ."

Silence. All contact was lost.

At once, a Martin Mariner rescue plane (a flying boat) was dispatched to Flight 19's last estimated position. The sun was setting and the weather growing poor, but the Martin Mariner was well-equipped with survival and rescue gear and could land in even the roughest of seas. The tower radioed Flight 19 to let them know help was on the way, but received no response.

The Martin Mariner soon reported that it was approaching the Avengers' position, but that it couldn't see anything. Suddenly, radio messages from the flying boat ceased. The controllers tried without success to reestablish contact. The rescue plane, too, had vanished.

A general alarm was raised. Other planes were sent, ships were dispatched. The flight paths of the Avengers and the Mariner were thoroughly searched. At 7:04 p.m., a Miami tower picked up a faint message: "FT ... FT. . ." Those were the call letters of Flight 19, which would not have been used by anyone else. It was two hours after the flight must have run out of fuel.

Navy and Coast Guard vessels searched throughout the night, and again the next day with 300 planes, 21 ships, and land parties scouring the Florida coastline, the Keys, and the Bahamas. The search continued for weeks, but no clues were found. No wreckage, no oil sticks, no survivors ... Flight 19 and its rescue plane had vanished into one of the greatest aviation mysteries of all time.

Although Flight 19 remains undiscovered, its disappearance is not without fact-and theories, ranging from waterspouts to alien spacecraft On the factual side, it has been determined that when Lieutenant Charles Taylor (the flight leader) first reported trouble, the five Avenger bombers were just north of the Bahamas, almost exactly on course when they decided they were lost. After careful study of the radio messages and other pertinent data, it is believed Flight 19 ditched several hundred miles off the northern coast of Florida, approximately adjacent to New Smyrna Beach.

Your job is to find and photograph the missing bombers, and lay to rest this baffling tragedy.

The Mysterious Blue Hole of the Bahamas

Imagine that you're snorkeling off the coast of the Bahamas and suddenly the clear, shallow reef you've been exploring drops away beneath you, forming a dark chasm. Unsure what to make of your strange discovery, you follow the reef's edge, looking for a way around, but soon you're back where you started. The chasm seems to be a perfect circle.

Returning to your boat, you start the engines and guide her through the coral banks. Ahead, you see a vast, dark patch in the ocean and catch the fin of something large break the surface. Was it a shark or a harmless *Manta* ray? You approach more carefully, watching the sea around the boat for signs of trouble. The dark patch looms ahead; soon the reef ends and you find yourself afloat over a tremendous hole in the ocean. You've just found a geological phenomenon called a "blue hole".

Blue holes are actually vast, underwater caverns originally hollowed out by fresh water and later filled with sea water. Little is known about the interior of this particular blue hole, but Stephen Wold, the Manatee Harbor geologist accompanying you on this mission, believes it may contain stalactites—significant if true, because stalactites would confirm that the hole was once a true cave located above the water's surface, a fact which could shed light on Earth's ancient history. Besides photographing the hole's interior, you must check for the presence of stalactites and, if possible, use the minisub's robotic arm to retrieve a sample.

Should you succeed, Team Manatee will add another piece to the puzzle of Earth's early history and your reputation in the scientific community will be well established. Good luck!

Romanche Gap

Picture a world without light and heat ... five miles beneath the ocean's surface where pressures exist capable of crushing your body instantly ... where life thrives in the darkness, gathered around volcanic vents in the earth's crust...

You are about to enter the Romanche Gap.

The Romanche Gap is a crevasse in the sea 25,354 feet deep, the third deepest point in the Atlantic. Scientists who first photographed this and other trenches were surprised to find life at the bottom: deep-sea urchins, cucumbers, brittle starfish, crabs, mollusks ... hatchet fish, vampire squid, armored worms, giant sea spiders. Many of these animals feed on the muddy sea floor, which resembles the surface of the moon. Others thrive on the sediments stirred by underground "vents" in the ocean floor.

Yours is a follow-up mission to a dive undertaken a year earlier by Dr. Forrest Crane, a colleague at Manatee Harbor. Crane and his team documented and photographed the life at the bottom of the Gap, but were unable to complete their work. In particular, they could not identify a life form they got only a brief glimpse of (and a blurred photograph, which you will find in the mission folder).

Funding for the mission has been established to finish Crane's work, but the financial backers are extremely interested in the unidentified life form. It is larger than anything yet encountered at those depths and could prove to be something entirely unknown.

COLUMBIA AIRLINES FLIGHT 609

The night sky was heavy above New York and snow was falling over LaGuardia Airport. Columbia Airlines Flight 609, bound for London, sat on the runway awaiting clearance. The passengers were restless. The flight had been delayed 45 minutes and many wondered if it would be cancelled. The possibility was strong; already there had been over 60 no-shows and the plane was eerily empty.

Finally, Captain Paul Nolan received word that the runway was clear. Moving the Boeing 747 into position, he lifted off at 12:05 a.m., Eastern Time.

Two hours later, the tower at LaGuardia received a message from Flight 609 reporting heavy turbulence followed by an intermittent electrical problem. One of the passengers had struck her head and was being cared for by the stewardesses, but her injury was minor and the electrical problem seemed to fix itself. They would continue.

The crew of Flight 609 then encountered a severe disturbance of which their weather advisory system had failed to warn them. At that point the captain decided to take manual control of the aircraft. The towers at Dublin and LaGuardia maintained constant radio contact.

An hour from Ireland, Nolan radioed again: "We have a loss of control response ... losing altitude. . ."

Two minutes later Flight 609 disappeared from the radar screens.

— — —

Search and rescue planes were dispatched immediately, recovering sixty-four survivors. Debris around the crash was extensive, and the Boeing 747 was located quickly lying under 600 feet of water.

To determine the cause of the crash, the flight recorder, or "black box", must be retrieved. Look for this object in the debris around the plane.

The tragedy of Flight 609 was enormous, with a loss of over one hundred lives. Finding the black box will be tough, but the reason for the crash must be learned. Many are counting on you.

THE WRECK OF THE *CAPITANA*

Between 1500 and 1800, Spain shipped over 8 billion dollars in gold and silver bars and coins through the Florida straits-the conquered wealth of America. In May of 1733, General Rodrigo de Torres y Morales sailed from Veracruz, Mexico aboard his *Capitana*, Rubi Segundo, with two other galleons and eighteen naos (ships identical in construction to galleons but with fewer guns) and smaller ships. They were joined in Cuba by a fourth galleon, and on July 13, the New Spain armada sailed out of the harbor at Havana bound for Spain by way of the Gulf Stream.

The following day the winds shifted abruptly to a gale from the east, and sensing danger, Don Rodrigo ordered his captains to change course and return to Cuba. The order was too late. By the next morning the winds increased to a full hurricane, scattering the fleet and leaving many of the ships wrecked along the Florida keys and the General's *Capitana* grounded in 18 feet of water off Key Largo. The crew and passengers reached shore and walked to Upper Matecumbe Key, where they found water and met other survivors.

Some of the ships were refloated and saved; others were swept to Cuba and wrecked there. The remaining sixteen ships were left disintegrating along the Keys in the outer reefs in water 8 to 40 feet deep. All told, over sixty-eight million dollars in treasure went to the ocean bottom.

The following year, the Spanish sent a salvage fleet and managed to recover 12,000,000 pesos in silver money and ingots, but had to abandon the project after storms completed smashing the ships. About \$6,000,000 in cobs and ingots, in addition to unknown quantities of jewelry and religious artifacts, were left scattered over the reefs and sand and buried in the wreckage.

In 1948, Arthur McKee, Jr., a professional deep sea diver, located the remains of a sunken ship off the Florida reefs. Among the rubble he found ancient cannons and ballasts and a number of silver coins dated 1732. The cannons and cannonballs were marked with a Spanish insignia, and after extensive research he received, through the Archives of the Indies in Spain, the account of the wreck of the New Spain armada in 1733.

McKee and his crew of divers went to work on the wrecked ship searching for the remaining treasure. They found hundreds of silver coins called "pieces of eight", gold doubloons, jewelry, Church artifacts, and three silver bars weighing 60, 70, and 75 pounds that made McKee famous and gave him the nickname "Silver Bar" McKee. One of the bars is on display at the Smithsonian Institution surrounded by pieces of eight and other objects from Spanish wrecks, and soon the accumulation of artifacts grew so great that McKee and some interested financiers formed a corporation called McKee's Museum of Sunken Treasure, Inc., and built the famous Fortress of Sunken Treasure at Treasure Harbor, Plantation Key.

The state of Florida recognized Art McKee's work by granting him, in 1952, exclusive salvage rights to all wrecks in a large area along the coast. But McKee wasn't interested only in treasure. Concerned with preserving history, he recovered pottery and chinaware, glassware, flintlock pistols, muskets and lead bullets, copper nails, nautical instruments, cannons and cannonballs—anything to give visitors to his museum a feel for era of the Spanish galleons. He even recovered some of the old timbers and ribs from the *Capitana* wreck site and rebuilt the ship on land in the courtyard near the Fortress.

Art McKee has since passed away, but his contributions live on. His salvage of the *Capitana* (also called McKee's Galleon) ushered in the age of treasure diving and submarine archaeology in America.

— — —

Choosing this mission will let you relive Art McKee's galleon hunts. Using your ship and the minisub, you can search for and photograph the *Capitana* in the Florida Keys, and, if you're lucky, find the *San Jose* and the *Infante*, other galleons which sunk in the same area.

About Jack Haskins, Jr., finder of the Haskins Medallion

Jack Haskins Jr. has been a commercial shipwreck salvor since 1965. His first expedition was to Padre Island, Texas, in search of the 1554 New Spain Flotilla.

His research and participation resulted in the finding of the *Concepcion* off the Dominican Republic. He has been on more than 30 missions and has conducted search and recovery in depths up to 2,000 feet.

For further historical information or inquiries, contact Jack Haskins Jr. at:

P.O. Box 567
Islamorada, Florida 33036
(305) 664-8130

NUCLEAR WASTE CLEANUP

Choosing a waste disposal site is one of the most controversial aspects of the nuclear waste issue, and this is one of your most important missions.

After fuel has been in a power reactor about three years, the concentration of Uranium-235 atoms is reduced and the fuel must be replaced. However, disposing of the spent fuel is no simple matter; the material remains radioactive (though at low levels) for many years, posing a hazard to the environment. A repository must be chosen that will interact with the environment as little as possible.

Earlier this century, before the hazards of nuclear waste became widely known, drums containing radioactive materials were routinely dumped into the oceans. As the dangers of radioactive waste became apparent, the issue grew in importance and controversy. Dumps sites are chosen only after extensive research. Nevertheless, leaks occur, and a worldwide effort is underway to clean up the seas.

The dump site you'll be working on if you choose this mission is located off the coast of Delaware. You'll rendezvous with the U.S. Navy, which has already begun cleanup operations there. Your task will be to sample leaking drums by targeting the leaks and extending the robotic arm, which will be carrying a small instrument designed to sample the radio-active matter.

To help you locate the corroded drums, Navy S.E.A.L. divers have layered the site with a chemical that makes the leaking material more easily visible.

CD-ROM SPECIAL MISSIONS

Additional missions have been included in the CD-ROM version of Discoveries of the Deep. To access them, you must press **M** while at the Manatee Harbor office, where they will be found listed after the seven core missions (see **Choosing a Mission**). Use the **F1 Key** to get the description and approximate location of any mission.

The Lost Temple

Director Withers hands you a facsimile. Dr. Luis Rivero-Del Rio, an associate of the institute living in the Canary Islands, reports that local divers have found a series of columns lying in roughly 200 feet of water. No further details are known, but Dr. Rivero believes the columns may be the remnants of a Roman temple rumored to have existed around 150 B.C., fifty years after the Romans conquered Spain. If he is correct, an important archaeological site awaits discovery.

You've been given approval to research the report. A photographic record of the site, if it can be found, is vital; any artifacts that may be recovered using the robotic arm would also be of great importance.

Undersea Volcano

The Atlantic Ocean is widening at a rate of an inch per year, about six feet in an average lifetime. Rifts along the Mid-Atlantic Ridge are constantly spewing lava and ash, creating new land masses and changing the face of the ocean floor. These active rifts, known as hydrothermal vents, or smokers, contain hydrogen sulfide that feeds bacteria. The bacteria, in turn, are the basic food source for giant tube worms and other life that thrive near the vents.

Using *Manta*, you can observe a smoker and the life around it first hand, taking pictures and using the robotic arm to probe the temperature of the molten ash.

Sea Lab Station

As part of Manatee Harbor's ongoing research in the area of marine ecosystems, undersea observation chambers have been constructed and placed near reefs around the globe. The chambers, giant, metallic spheres on four legs equipped with several observation ports, house a single researcher in shallow water (about a hundred feet) for periods of 3-4 weeks. In that time, the researcher may dive, observe, takes notes and photographs, and collect specimens.

One of the chambers has developed a slow leak. Karen Teague, the field scientist reporting the problem, is dumping out water on a daily basis and worries that the leak may worsen. You must take a ship out to the area, locate Sea Lab, and use *Manta*'s arm to repair the hull.

Before you leave, the minisub will be outfitted with the equipment and materials needed, but you'd better hurry-this is definitely a rush job!

Bermuda Mysteries

Always a source of mystery and legend, the Bermuda Triangle has been blamed for the disappearances of dozens of ships and planes over the years, and the reports never seem to end. An exploration of the area (provided you are not superstitious) may yield the remains of lost vessels, but there have also been reports of ghost ships, strange radio messages, and unidentified flying objects ...

Emergencies

Accidents at sea are commonplace, and while sailing you may be confronted with a distress message from a ship, plane, or hot air balloon. If you encounter such a situation, use the Teletype in the Instrument Room. Check Channel 2 for the distress message and confirm receipt of the message with the Send Button; a rescue action will automatically be undertaken, adding points to your score.

SUMMARY OF KEYBOARD COMMANDS

MANATEE HARBOR OFFICE

F I - General/Mission Help
H - Local Help
D - Got To Dock
1-7 - View Mission Folder
M - List All Missions
F - Open File Cabinet
S - Slide Room (File Cabinet Menu)
L - Log Notes (File Cabinet Menu)
C - Certified Status (File Cabinet Menu)
R - Return To Office (File Cabinet Menu)
E - Exit Game

SLIDE ROOM

Up Arrow Key - Scroll Up Menu
Down Arrow Key - Scroll Down Menu
Space Bar - Highlight File, Advance To Next Slide
Esc - Begin Slide Viewing

PILOTHOUSE

F I -General Help
H - Local Help
Right Arrow - Turn Wheel Right
Left Arrow - Turn Wheel Left
Up Arrow - Increase Ship Speed
Down Arrow - Decrease Ship Speed
E - Start Engines
I - Go To Instrument Room
N - Go To NavMap
P - Port
C - Clipboard
R - Recreation Room

INSTRUMENT ROOM

F 1 - General Help
H - Local Help
F - Return To Pilothouse
N - NavMap
S - SonMag
D - Depth Sounder
T - Teletype
R - Receive Radio Message
L - Launch Minisub
C - Clipboard

NAVIGATIONAL MAP

F I - General Help
H - Local Help
P - Activate Plotter
G - Go To Plotted Position
R - Restore Position
W - Show Weather
B - Show Bearing
D - Show Data
K - Switch Color Scheme
C - Clear NavMap Screen
F - Go To Pilothouse
S - Show Ports
L - Show Land
E - Exit

SONAR-MAGNETOMETER

Fl - General Help
S - Sonar
M - Magnetometer
D - Show Data
E - Exit

DEPTH SOUNDER

- F1 - General Help
- G - Graph
- C - Change Color Scheme
- D - Show Data
- R - Take Reading
- E - Exit

TELETYPE

- F1 - General Help
- 1 - Use Channel 1
- 2 - Use Channel 2
- S - Send Distress Signal
- R - Receive Message
- E - Exit

RADIO

- R - Receive Radio Message

MINISUB

- F1 -General Help
- H - Local Help
- C - Reconnect With Ship
- A - Robot Arm
- L - Outside Light
- S - Full Stop
- F - Forward Throttle
- B - Backward Throttle
- P - Take Picture
- Z - ZOOM (Double Speed)
- X - XOOM (Halve Speed)
- Up Arrow - Descend
- Down Arrow - Ascend
- Left Arrow - Turn Left
- Right Arrow - Turn Right
- T - Show Remaining Operating Time
- Esc - Hide Remaining Operating Time

RECREATION ROOM

- 1 - Tank
- 2 - Dartboard
- 3 - Map Room
- Esc - Exit

DARTS

- T - Throw Dart
- Q - Quit

TANK

- Up Arrow - Move Forward
- Down Arrow - Move Backward
- Left Arrow - Turn Left
- Right Arrow - Turn Right
- Space Bar - Fire Cannon
- M - Toggle Sector Map
- A - Turret Left
- D - Turret Right
- Esc - Exit

CUSTOMER SERVICE

If you experience difficulties with this or any other Capstone software product, you can call the Customer Service Department between 9 a.m. and 6 p.m. Eastern Time, Monday through Friday, for technical assistance. Service is available for all registered owners.

Intracorp

7200 Corporate Center Drive
Suite 500
Miami, Florida 33126

(305) 591-5900
Facsimile (305) 591-5633

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