

DEEP SEA TREASURES



Manufactured in the UK for

Game Concepts

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*****IMPORTANT NOTE*****

Deep Sea Treasures now incorporates a
POWER ON DELAY

The machine will not power up until approximately
30 seconds after power has been applied and the machine switched
on.

If a brief interruption in the mains supply occurs the machine will
take another 30 seconds before re-booting,

This is to allow the computer system / hardware to fully stop.

Bypassing / altering the timer could cause damage to the hardware
/ software and is NOT recommended and will invalidate any and
all warranties.

COMMISIONING

1.1 Receipt of Machine

Upon receipt of machine carefully remove all protective packaging and establish machine on a flat and level floor. Take care to protect the machine from sudden shocks etc. when lifting or manhandling.

The machine should only be situated indoors, and should not be subjected to any other environments. Ensure all ventilation grills have at least 4" (100mm) clearance from other surfaces to permit adequate cooling.

1.2 Electrical Connection

Deep Sea Treasures should be connected to the mains supply via a suitable lead to suit your installation requirements. A standard U.K or European lead is supplied, depending on destination. If in any doubt, consult a qualified electrician.

Mains wiring: Live Brown
 Neutral Blue
 Earth Green/Yellow

THIS MACHINE MUST BE EARTHED

Machine	Deep Sea Treasures				
Voltage:	230	VAC	Freq:	50	Hz
Power:	460	W	Amps:	2	A
Overall weight			X		
Kg	lbs				
165	364				

1.3 Electrical Supply and Entry

The electricity supply socket is located at the rear of the machine. The On / Off switch for the machine is located in the lower front compartment on the right hand wall.

1.4 Initial Operation

Connect the mains supply and switch the machine ON. The Top-Sign fluorescent lamps will illuminate along with the side playfield lights and the dichroic lamps. The pusher box will start moving.

The PC will go through the following sequence; BIOS, Post BIOS, Loading Windows, Loading Game (Blue Bar). It can take around 2 minutes for the game to start. If this sequence fails, turn off the machine for 10 seconds, and then try again. There is a power switch located on the side of the PC; this can be used to switch the PC on / off.

Deep Sea Treasures incorporates a bucket coin lift assembly that is located behind the rear main panel. During the transfer of coins from the bottom hoppers to the top hoppers transfer sounds may be heard (such as the motor drive, and the sound of "spilling" coins). These sounds are indicative of the normal operation of the lift system. The bucket lift is activated when a set amount of coins have been transferred to the bucket(s) or when the machine is first powered up.

1.5 Floating the Coin Hoppers

Important: it is imperative to check for any foreign objects in the hoppers and remove them. Although the machines are vacuum cleaned before packing, odd screws etc are easily missed and can end up in the hoppers during transportation. Clearing a jammed hopper just after floating is best avoided!

Each hopper needs a float of approximately 300 to 400 coins. To fill the lower hoppers, remove the front glass (301 key). The front part of each side artwork is removable for filling the hoppers – a small Perspex rod is fitted as a handle. Remove each of these covers then take the following steps:

1. Turn machine on
2. Drop 500 coins down each hopper chute.
3. Turn the service key.
4. Scroll down the menu to hopper float.
5. Press the select (step) button, a noise will then be heard, after 10 seconds the float process will begin
6. Once float process has finished put a further 300 coins down each hopper chute.

NOTE: During the float process turning the service key will cancel the operation.

Replace the covers then the glass.

In use, the hoppers should remain full and overflow to the cashbox. If the coin mechanism is used continually, both hoppers may eventually run out. If a hopper runs out, or jams, the 'Hopper Empty / Jammed' message is displayed on the monitor. Correct the fault and press the 'Reset Button'. See section 1.9 for button location.

Switch the machine on.

Insert a coin in one of the coin entry chutes: a sound is generated as the coin is accepted: the corresponding hopper issues a coin into the Perspex: the diverter solenoid activates, allowing winnings to be diverted to the player: the coin-in counter will increment. The game is now 'live' and will remain so for the 'Set' period, (factory setting 30 seconds), or until tilted.

1.6 Testing the tilt system

The tilt alarm feature may be tested by rocking the machine. The alarm will sound and the diverter solenoid de-activates. Any coins falling into the win chute are now diverted to the cashbox. The operation of the tilt alarm lasts approximately 10 seconds, then reverts to attract mode.

1.7 Testing the Motor Jam System

A safety feature is incorporated which stops the pusher drive motor, should a jam or restriction occur. Simply holding back the advancing pusher box will demonstrate this. The response of this feature is adjustable (see motor control section). This operation may be reset by pressing the reset switch, located at the back of the machine on the right hand side above the main rear door.

1.8 Floating the Playfield.

The playfield requires approximately 1800 coins to present a reasonable game, depending on coin size. Place the first 1500 by hand. Play the last 300 via the coin slides to give the best possible visual appearance of the playfield area. Insert more coins if required.

Check the hoppers and top up if necessary – the playfield may accumulate many more coins during the first few days, and fluctuate thereafter about a mean average.

1.9 Dumping the Hoppers

To empty the hoppers take the following steps:

1. Remove the front glass.
2. Remove front door and place bucket in front of the machine.
3. Block left and right lose holes with a bunched up cloth.
4. Turn on the power
5. Once game has loaded, turn the menu key.
6. Select hopper dump (item 5), after a short delay the hopper dump sequence will initialise
7. Dumping all of the hoppers may take some time, upon completion the monitor will display a "Dump Complete" message.

***Note: The hopper dump system utilises the left / right play buttons to increase / decrease the speed in which the coins are released, these buttons can also 'pause/resume' the dump process. Please refer to the on screen menu for the dump system status during this time.**

1.10 Service Menu

Adjustments to Deep Sea Treasures can be made from the service menu. This is activated by turning the service key, as shown below.



Service Key Select Down Up

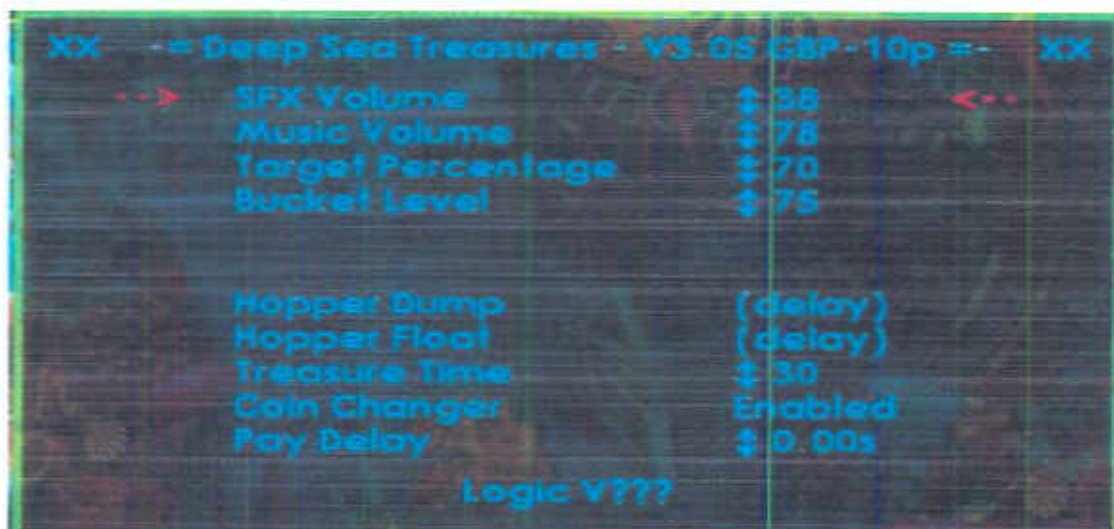
Cont...

Scroll through menu items press the “Up or Down button. The current menu item is shown by the “—>” symbol, when this is adjacent to the required menu item pressing select will turn the selected option writing red & allow for adjustment. Adjustments are made using the Up and Down arrows.

The following Menu Options exist

1. Sound Effects Volume (SFX Volume)
This value can be adjusted from 0 (no sound) to 128 (Loudest setting).
2. Music Volume
This value can be adjusted from 0 (no sound) to 128 (Loudest setting).
3. Target Percentage
This value is adjustable from 30% to 100%. This value represents the percent of bonus coins paid out to number of coins inserted.
4. Bucket Level (Default 75)
It is recommended that this value remain un-altered as over filling or hopper starvation may occur.
5. Hopper Dump – Initiates dumping of all coins. (Section 1.9)
6. Hopper Float – Initiates primary floating of machine with coins / tokens (Section 1.5).
7. Treasure Time – Increasing / decreasing this value will determine how long the treasure chest remains on screen once activated (Factory set to 50 seconds)
8. Enables / Disables the coin mech
9. Pay Delay – Adds a delay between each coin dispensed during a ‘coin splash’ win (default 0.00).

The service menu also displays ‘Target Percentage’, ‘Actual Percentage achieved’, coin in and feature meters and low level hopper status.







Menu Cont.....

The main menu also displays the software version that the game is running (example: "V3.05") and the Logic board firmware version (example "Logic V1.4d").

In addition to the main menu system accessed via the keyswitch there is also some additional information on the main game screen which alerts the operator to any hopper that may have run low on coins.

In the bottom left & bottom right of the game screen there are some sea

shells on the sea bed:  for the bottom hoppers &  for the top hoppers. Should any one of these hoppers run low on coins the

corresponding sea shell will flash red:   and the message "PLEASE USE COIN SLIDES ONLY" will be displayed in a message box at the bottom of the screen. The coin mech will also be disabled until the hopper is replenished (either by manually filling or through the loose holes)

Access & Maintenance

WARNING – DANGEROUS VOLTAGES EXIST WITHIN THIS MACHINE

2.1 Access to the machine

Playfield

Release the locks at the top of the glass (301 key) and hinge forward far enough to get a firm handhold either side. Carefully lift clear of the machine and store safely.

Lower Cabinet

Release the locks in the sides of the cabinet and remove the front door.

Back Door

Release two door locks (301 key), tilt back then lift door clear.

Cash Box

There is a secure door located below the lower cabinet, which can be fully removed by releasing the lock at the top (201 key), hinge out and lift clear. The cash box is located within.

Cont....

Top-Sign (Front)

To remove the front of the top sign release the lock (301 key) tilt the top of the sign forward, lift and remove. Fitting is the reverse of removal.

Top-Sign (Rear)

To remove the rear top sign door remove the security Allen Key, tilt the top of the panel forward, lift and remove. Fitting is the reverse of removal.

2.2 General Care & Maintenance

Deep Sea Treasures is a robust and reliable machine, which looked after will give years of profitable service. Regular cleaning is the key to optimum condition and performance.

To maintain all visible surfaces in an 'as new condition':

1. Plastic and Glass Fiber – use a general purpose (non aggressive) water based detergent and finish with a quality furniture polish.
2. Laminated Cabinet trims – clean with an all-purpose non-aggressive cleaner and finish to a high gloss using a furniture polish.
3. Glass and Chrome – clean with a quality window cleaning solution.

Do not use caustic or abrasive cleaners. Always use cleaning products in accordance with the manufacturer's instructions.

Deep Sea Treasures utilizes 'sealed for life' type bearings and high quality mechanical components that do not require regular greasing or regular servicing.

Game Operation

3.1 Game Description

When coins of the correct type are inserted into either the left or right coin entry chute, or credits are played off using the Left / Right play buttons a coin is dispensed from the corresponding hopper into the bucket lift. As this happens the corresponding top hopper issues a coin to the playfield via the pin Perspex.

Coins entered through the coin mechanism are recorded as credits on the dual 7 segment display. They are played off using the "Play Left" & "Play Right" buttons. Coins are then dispensed onto the playfield from the corresponding hopper.

Coins hitting the active pins on the Perspex trigger an explosion / miss animation on the screen. If an character is hit the value currently displayed on the character is awarded via the top hoppers to the pin-Perspex. If when the character is hit the treasure chest symbol is displayed the treasure chest will appear and 'float' around the screen for a limited time (default 50 seconds)

If the treasure chest is hit the treasure chest increases in size, the lid creaks open and an explosion of doubloons animation is seen. The value shown on screen during this explosion of doubloons is paid down the pin Perspex to the playfield. Once this value has been dispensed the characters re-appear and normal play resumes.

3.2 Percentage calculation

At the front side edges of the playfield are the lose chutes, down which coins are routed into the lower hoppers. These chutes are covered by a plastic cover and are not visible to the player. The number of coins falling down the chutes may be controlled by the position of an adjustable plate; adjustment being effected by removing the plastic cover, slackening off the screws and moving the plate across the opening as required.

In addition to the loose holes there is an option to adjust the percentage won (characters hit) in relation to the coins / credits played to allow for increasing the percentage of 'wins' returned to the player, the program will adjust the values and frequency of the treasure chest and values on the characters to maintain the target percentage.

Note: Coin Buildup

When a higher playfield percentage is set (by closing up lose holes) this will result in much less playfield buildup, due to forward movement of coins on the playfield pushing piled up coins over the edge.

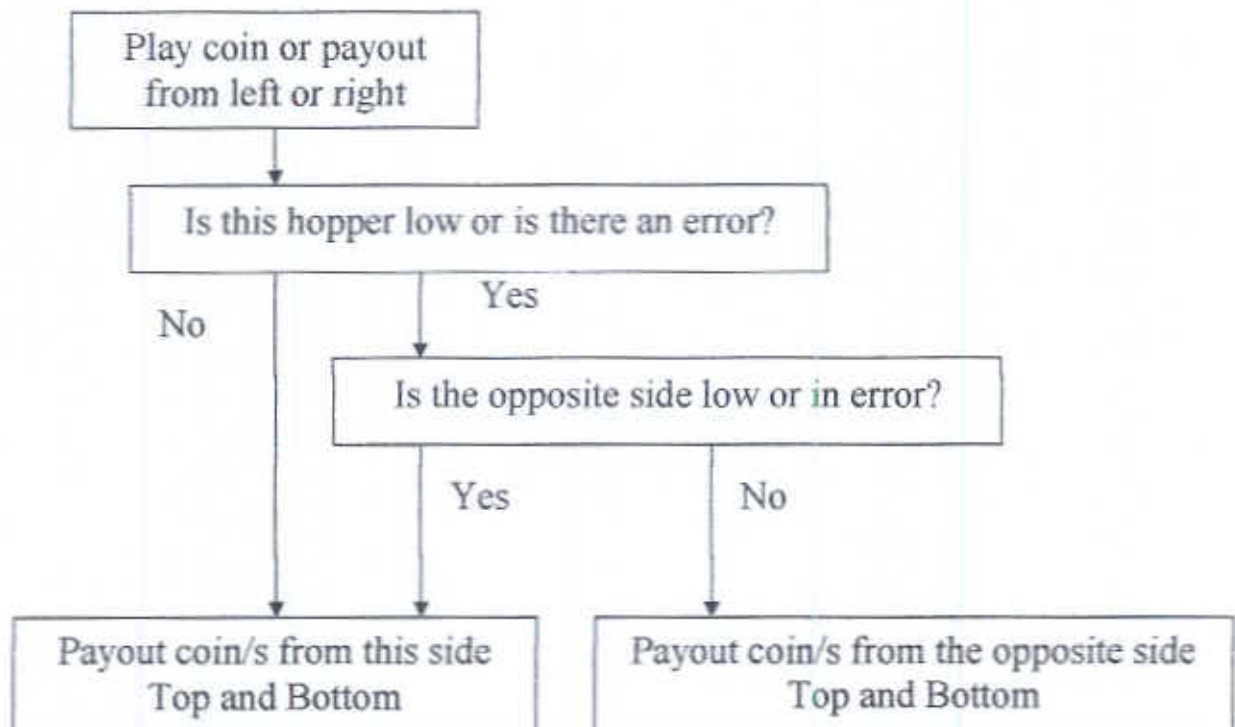
Similarly, when a lower playfield percentage is set (by opening lose holes) this results in a much higher coin buildup, this is due to coins taking a sideways path, therefore coins which do not fall flat will tend to build up higher.

3.3 Hopper System

The hopper system is configured so that the top hoppers can never empty. This is achieved by using the following method.

For every coin entered a coin is paid out of the corresponding top and bottom hopper.

This is true until a lower hopper runs low then all of the payouts are switched to the opposite side, this will continue until a high level is seen again. If there is a hopper error, the payout will also switch to the other side. If both lower hoppers are low then the game will not swap over.



3.4 - Credit Display

The machine is fitted with a dual digit seven segment LED display. This is used for showing the player credit information.

The display will usually show the number of credits

For example, if the player inserts a one pound coin (10p play), the following will be shown.



The credit display shows up to a maximum of 99 therefore the coin mechanism will lockout after 79 credit because if a two pound coin (20 credits is inserted) this would exceed the 99 limit.

Part credit

The display will notify the player when there is half a credit (5p has been inserted) by **flashing** the following on the display.



Hopper low lockout

If a hopper is low the coin mechanism is locked out to prevent further load on the hopper. This is indicated in the credit display by **flashing** the following.



During this time the monitor will display a message indicating to use the coin slides only/

Fault Finding

4.1 Alarms

The following alarms are present in the Deep Sea Treasures Machine.

Alarm	Message	Activated by	DE-Activated by
Tilt	Stop Banging / tilting me	Tilting or banging the machine	This alarm will timeout after 10 to 20 seconds
Hopper	Upper Left, Upper Right, Lower Left, Lower Right, Hopper Empty.	This alarm is activated if a hopper completely runs out of coins or is jammed for 10 seconds or more. This alarm may also be activated if the optical sensor does not see coins passing through. If this happens many coins will be lost from the hopper and not registered on the meters	Ensure that ALL hoppers are full and not jammed then press the Reset switch at the front of machine to clear this alarm.
Motor	Motor Jammed.	The pusher motor cut-out circuit switching the motor off, due to motor running slow or stalling.	Press the motor reset switch at the top right side on the back of the cabinet. If alarm persists and motor is running press the reset button at the front of the cabinet.
Coin Slide	Coin Slide / Strim Alarm	This alarm is activated by the dual coin-opto board detecting a slow coin through a slide entry.	This alarm will timeout after 10 to 20 seconds

4.2 Methodology

It is of mutual interest that your machine is kept in excellent working condition, therefore when required please order original replacement parts from your distributor.

If a fault occurs with any electrical system **SWITCH THE MACHINE OFF**. Check that:-

- a) There is a suitable mains supply.
- b) All circuit breakers are set.
- c) All plugs and sockets are correctly mated.
- d) No wires are trapped, damaged or broken.
- e) All wires are properly secured to their terminals and pins.

Wiring check.

A visual inspection will reveal the general condition of the wiring. A more thorough test using a continuity tester will be needed to check apparently intact wires, however once a machine has been playing successfully for some time wiring is not usually at fault.

Device testing.

Disconnect the machine from the mains supply then check the physical condition and operation of the suspect device. Remove from the machine if necessary and bench test using a suitable power supply and wiring.

In general PCB's, PC and monitor are not user serviceable. Should a problem develop indicating a board fault it is recommended that the board be returned to your supplier for repair / replacement.

4.3 Systems Checking

When a fault occurs that affects the whole of the machine, the power supply system should be investigated first.

Check the supply input connection, and main supply circuit breaker is set.

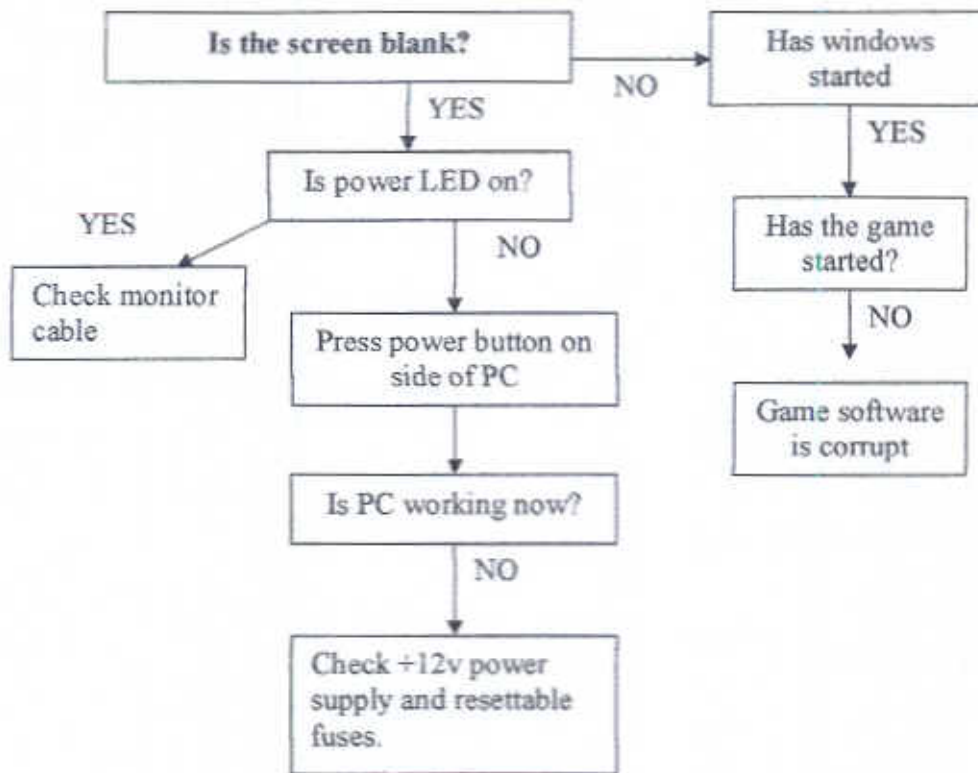
If the fault is not visual, or easily measurable it is often helpful to disconnect the outputs from the PSU, check that the PSU is functioning then connect the loads one at a time.

It is easy to identify the faulty system, and use a similar technique within that system (such as disconnecting all hoppers) to identify the faulty component.

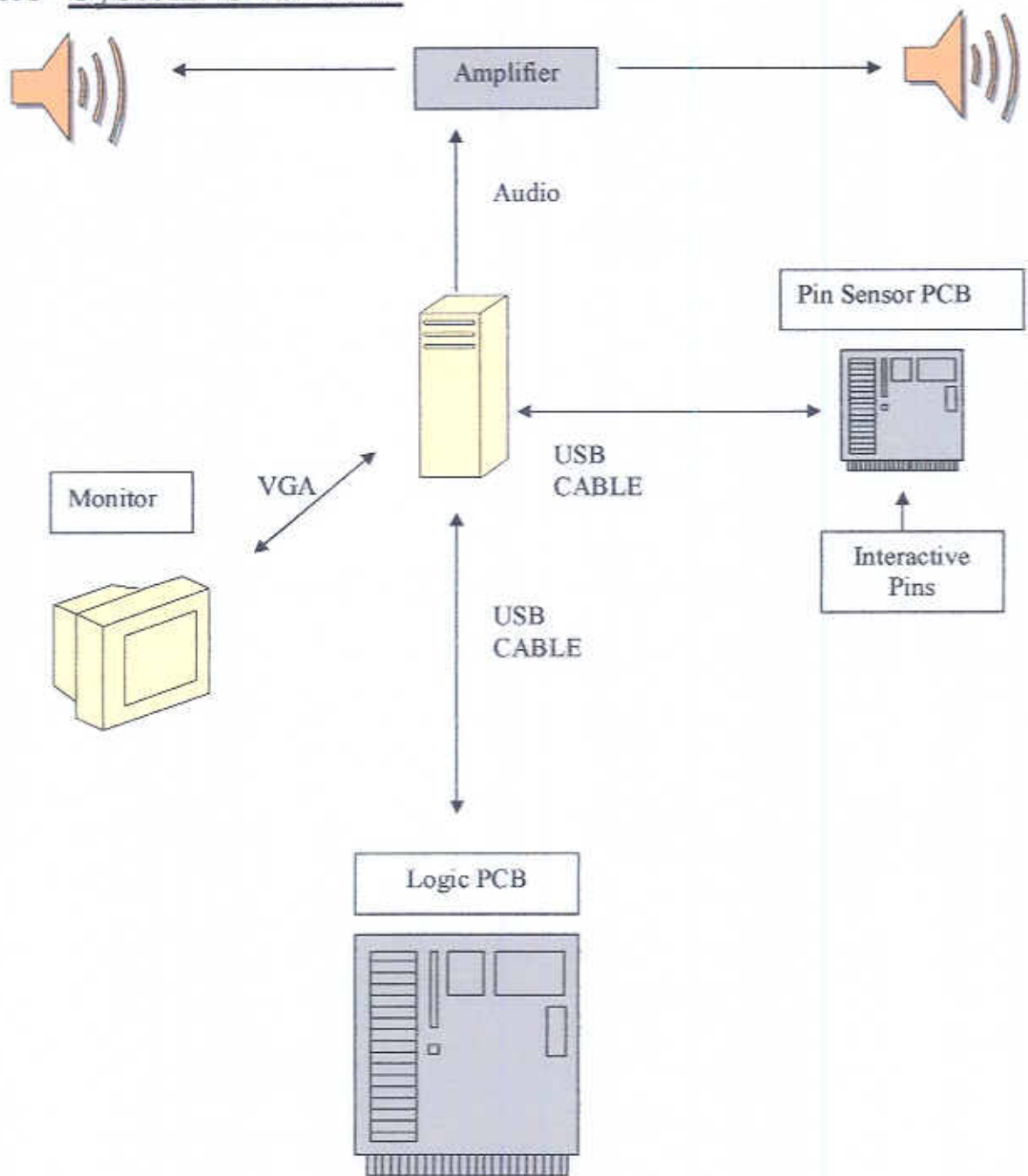
4.4 Basic Checks

Symptom	Possible Fault	Remedy
Will not start	Internal switch OFF Circuit Breaker tripped	Check internal switch is ON Check plug fuse then circuit breakers.
No sound	Volume, Speaker, Amplifier	Check power supply and connectors, replace board if faulty
Light failed	Tube failed or Starter failed Choke (ballast) failed	Check end caps & wiring. Replace tube. Replace with same type. Replace with same rating.
Pusher boxes not moving	Power to motor or Mechanical jam	Check for coins or Swag causing jam. Clear & reset system.
Tilt alarm not working or continuous.	Pendulum stuck Door bump sensor Sound	Check pendulum & adjust. Check & adjust. Test connections & power
Counter not working	Wiring Counter Coin entry	Check connectors & loom. Bench test / replace. Check every coin entry.
Hopper not working	Hopper motor, Power, Hopper Jammed.	Bench test with power. Check supply & connections. Check for obstruction
PC Not working	Connection PC switched off	Check power plug into PC Press Power on button on right side of case.
No picture on monitor	Monitor cable Monitor Power PC not working	Check monitor cable to PC. Check monitor power. Check PC LED is on.

4.5 Computer System



4.6 System Overview



Electrical Systems

5.1 Mains Supply Circuit Breaker

The Mains Supply is protected by a 3A thermally operated circuit breaker, which can be manually reset. This circuit breaker is located in a metal enclosure together with the main supply switch, located in the lower cabinet on the front right hand wall.

Should this device trip, first find the cause of the fault and rectify. To reset the device, simply press the yellow centre back in to the body of the circuit breaker.

5.2 Motor Fuse

The pusher box motor fuse is located on the motor control PCB, inside the power supply box in the cabinet base. This fuse is designed to protect the motor control circuitry and must only be replaced with an identical item. Failure of this fuse would normally indicate a motor fault.

Motor fuse

2 Amp (T) 20mm

(T) = Time Delay/Anti-Surge

5.3 Hopper Jam Protection

Each of the four hoppers have a stall mechanism, the hopper control board detects a stall situation and initiates motor reversals to free jams. If this condition exceeds 10 seconds or the hopper is empty the machine will go into an alarm condition to prevent motor damage.

Should this occur an alert message will be displayed on the screen.

5.4 Power Supplies

WARNING – Dangerous voltages (230 V) – Disconnect from the mains supply!

The power supply is in the machine base. This provides the DC supplies for the electronics, PC and monitor.

The enclosure in the top sign area houses the transformer that provides the AC supply for the dichroic lighting. Both power supply enclosures also house circuit breakers for the respective circuits.

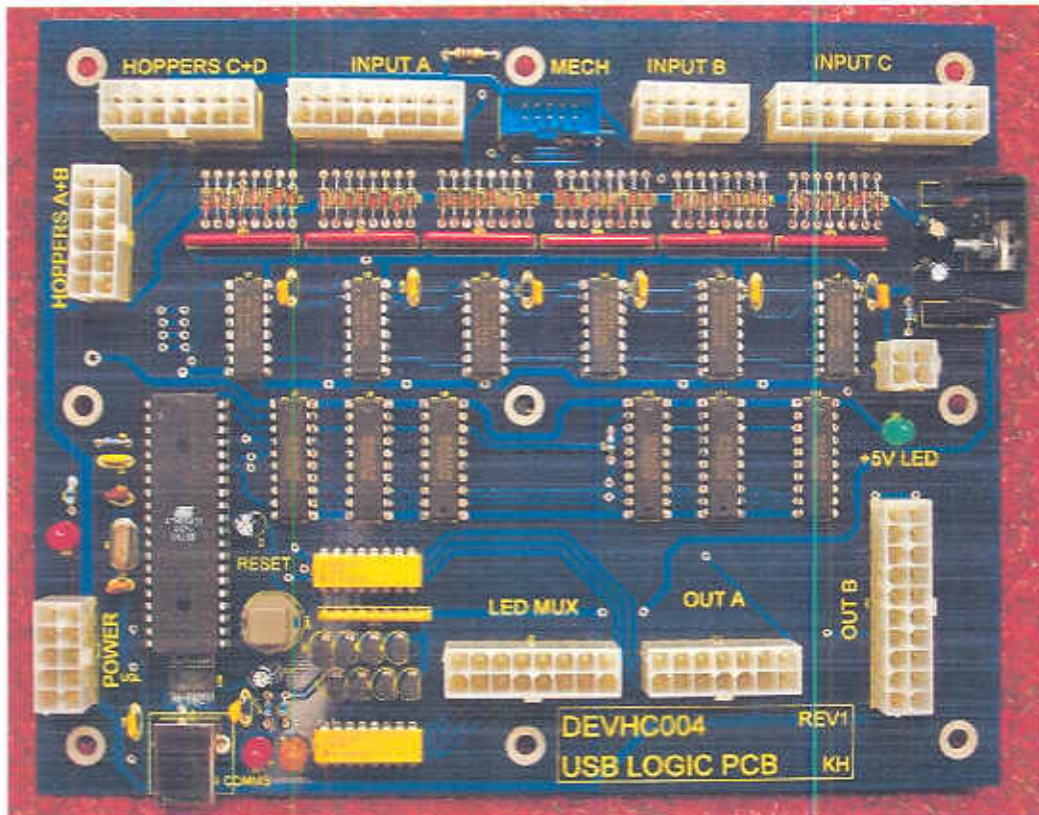
The power supply in the bottom of the machine contains a ‘Motor Control’ circuit board. These boards are enclosed to comply with safety regulations, as they have dangerous (Mains) voltages present on them.



Resettable fuses are located on the side of the Power Supply (as shown on the left).

5.5 Logic Board

The main logic board is located inside the lower front part of the machine within a metal box. There are no user functions on this board. Instead, the game variables are altered from the menu and Set-Up board, located on the coin mech shelf below the coin entry / paycup shelf.



5.6 Amplifier PCB

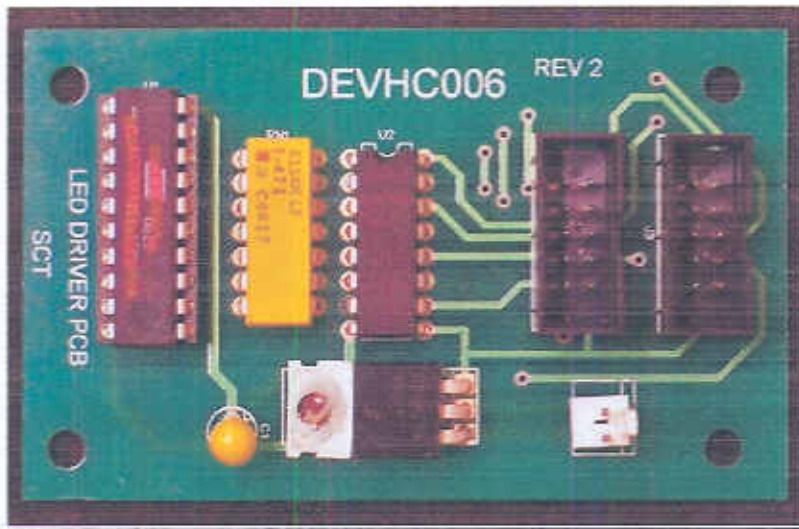


viewed from rear) approximately half way up the monitor.

The amplifier PCB amplifies sound from the Line Out of the PC. This is connected to the two speakers in the top sign. There is no volume adjustment on the PCB. Adjustments are made from the game software in the Menu screen.

The amplifier PCB is located in the rear of the machine on the right hand wall (when

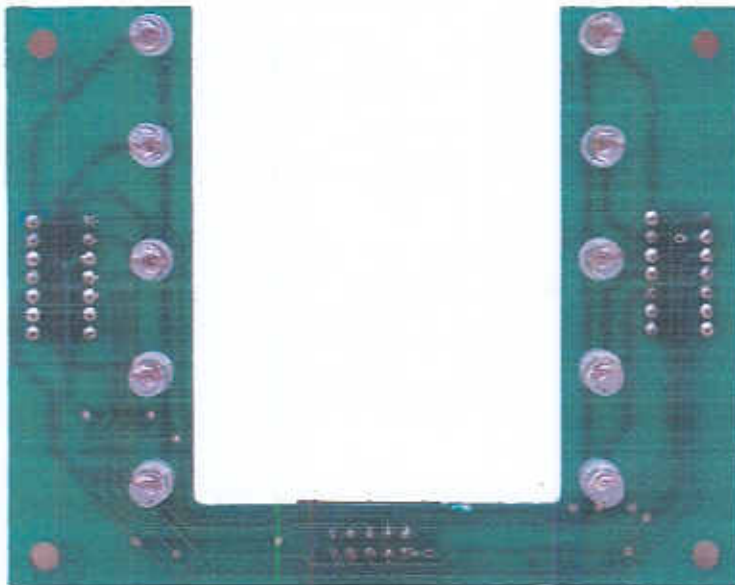
5.7 Led Driver PCB



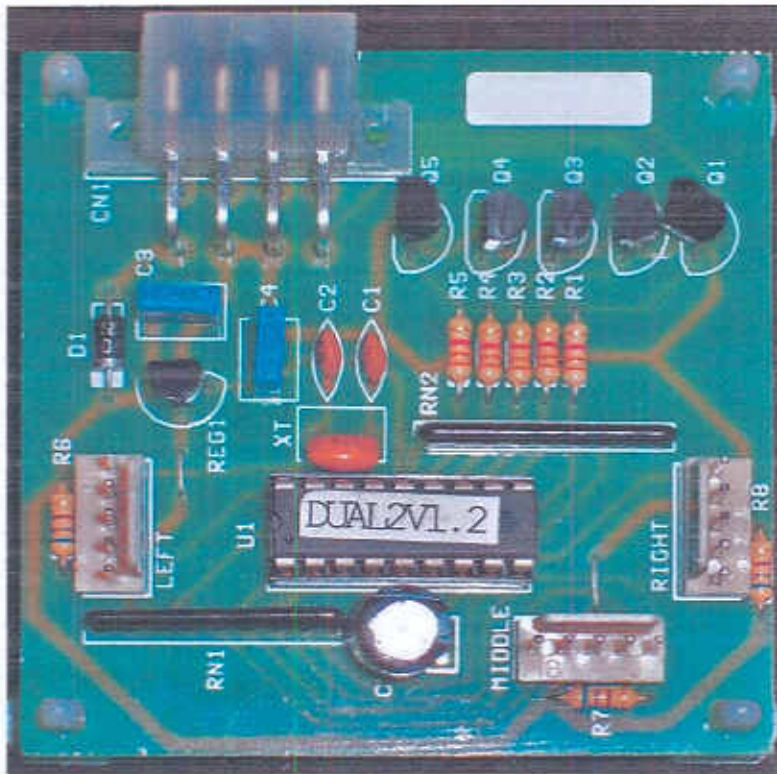
This PCB controls the running lamp PCB's below, there are no user adjustments on this PCB. This board is located behind the GRP front door to the left of the 'Pay' chute.

5.8 Running LED PCB (s)

These are situated around the coin entry slots and linked to the above board by a 10 way IDC ribbon cable.

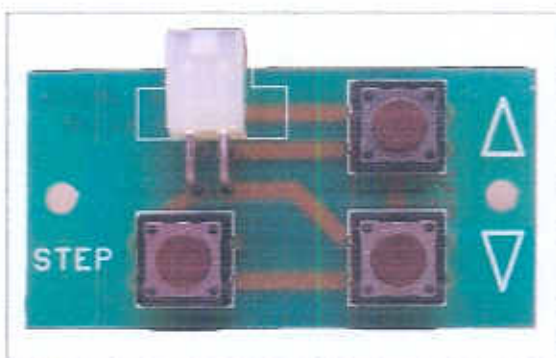


5.9 Coin Entry sensor PCB



This PCB is connected to the two coin slide entry's. There are no user adjustments on this PCB. This PCB issues coin in and strim alarm signals to the main logic PCB. The PCB is located behind the main GRP door to the right of the 'Pay' chute.

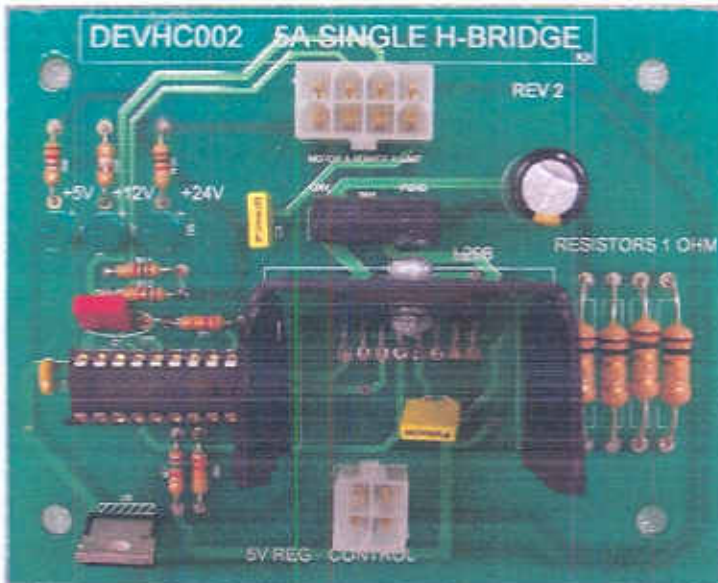
5.10 Stepper PCB



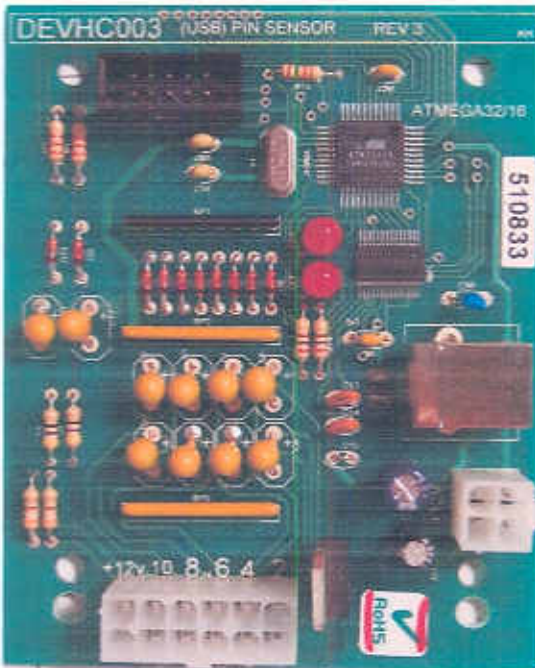
The stepper PCB is used to control the menu function of the game; there are further details of this function under the Service Menu chapter 1.10.

5.11 H-Bridge PCB

The H-bridge PCB takes signals from the logic PCB and moves the lift bucket up or down. The Limit switches are connected into this board so that if the lift was to overrun the stop switches that are connected to the logic board, the lift motor will stop. The PCB is located in the rear of the machine on the right hand wall (when viewed from rear) near the bottom of the monitor.



5.12 Pin Sensor PCB



The Pin Sensor PCB communicates with the PC supplying the information on which pin has been hit by a coin / token.

This PCB is located in the playfield area behind the vertical left hand artwork to the side of the monitor. To access this PCB you must first remove the playfield glass door, remove the left playfield lamp (CAUTION, THIS LAMP WILL BE HOT!) and remove the lower left artwork panels, this will allow you to 'pull' the vertical artwork towards the front of machine and remove it.

5.13 Electromechanical counters

Electro-mechanical counters are provided for coins-in and feature winnings, these are located in the front of the machine behind the GRP door.

5.14 Coin Entry

Coins of the play denomination may be inserted at the play table in either the left or right hand side. Each coin entered will result in a coin being issued from the upper hopper to the top of the playfield pin Perspex. Coins of other denominations may be entered via the coin mechanism and these will result in credits being added to the credit display. Pressing the left or right button will now use these credits and issue coins to the playfield.

5.15 Computer system

The PC is located in between the logic board and the power supply unit. There are no user serviceable parts inside the PC. Maintenance is unnecessary; if the PC should become faulty or fail please return it to the manufacturer for servicing / repair.

There is a power button on the side of the PC; this is used to turn on and off the computer independently from the main power switch.

The computer will remember whether it was switched on or off when the machine is powered down every night, therefore if the computer is switched off using this power button and the main machine power is turned off then the PC will not switch on it is re-started the following day.

When an error occurs or a new USB PCB is installed in the machine, at first boot the machine will register and install the new PCB and then shut down. After this has happened it will be necessary to switch the computer on with computers power button.

Cabinet Lighting

6.1 Fluorescent Lighting

WARNING – Dangerous Voltages (230v) – switch OFF prior to replacing!

Fluorescent tube lighting is situated in the top sign. The lighting has double insulated fittings in accordance with current regulations. The control gear is mounted in a light box located in the top sign. If replacement of any part is required, ensure identically rated items are used.

6.2 Dichroic Lamps

Low voltage dichroic spot lamp lighting is situated at the top of the playfield. These lamps are easily replaced by simply pulling the old bulb free from the fitting, and pushing the replacement bulb back in place. They are rated 12V 20W.

*****WARNING*****

These lamps become very hot in operation – allow to cool before handling!

6.3 Neon Glow Wire

Deep Sea Treasures is fitted with Neon Glow Wire this is controlled by a DC/AC Inverter with the following specification.

Input Voltage: 12 (VDC)
Input Current Range: 212 mA
Output Frequency: 2.5 (KHz)
Output Voltage Range: **126 (Vrms)**

**** This high voltage is very dangerous ****

Mechanical Systems

7.1 Pusher boxes

The pusher box is mounted on two Accuride slide bearings. An annual check to remove any build up of dust and a light coat of grease will ensure many years of reliable service.

Ensure that the coin scraper system is fully intact and working smoothly and freely, replace any suspect parts.

7.2 Bucket Coin Lift System

The bucket system works in the following method. For each coin paid out of a top hopper one is paid out from the bottom hopper on the same side. When the lift bucket reaches a preset level (default 75 coins) the lift buckets are taken to the top and emptied into the top hoppers. The bucket is then returned to the bottom of the machine and any coins owing to the bucket are paid out. This keeps the top hoppers full to the original level.

Under normal circumstances no refilling of this systems is necessary as hoppers are fed from the lose holes on the playfield.

*****WARNING*****

If for any reason the machine is being serviced with the power on and the back door removed beware of buckets moving under normal operation.

Service buttons for manual UP / DOWN movement are fitted behind the back door on the right hand wall (when viewed from the rear)

7.3 Diverter Flap

The Diverter flap is moved by the Diverter Solenoid. This is driven from a small PCB located near to the Solenoid. This PCB takes power from the power supply (+24v) and a small signal from the Logic Board.

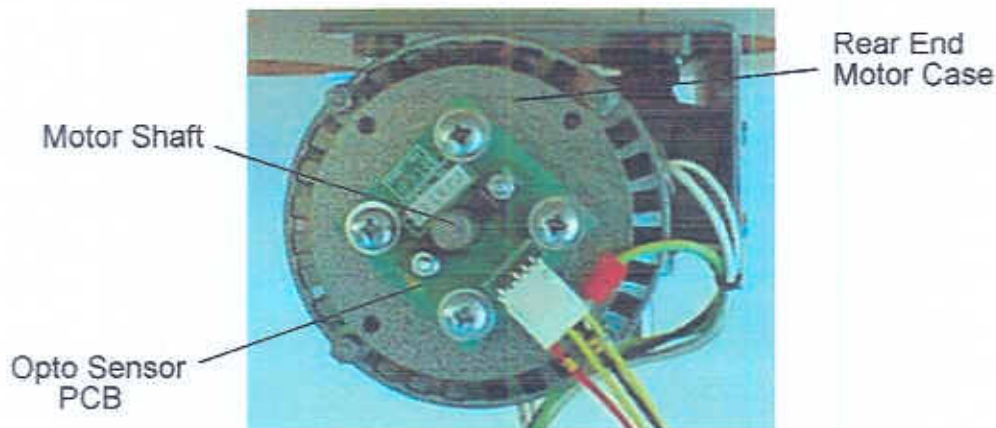
The Diverter Flap is active for around 30 seconds after a coin is entered or a payout is made from a hopper.

Appendix

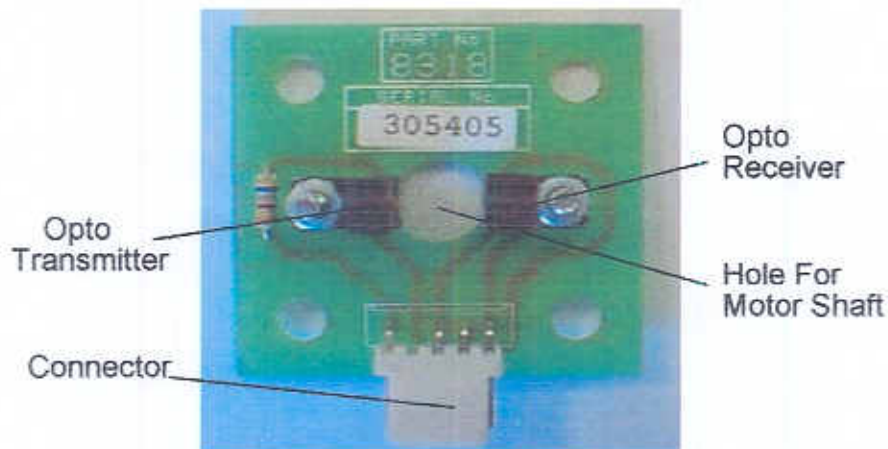
8.1 Motor Cut-Out Circuit

Operation

The motor drive shaft extends some 35mm out of the rear end of the motor case. It is here that the opto sensor PCB is located, secured to the motor case. The motor shaft has a hole drilled in it, through which the infra red beam may pass when correctly aligned. With the rotation of the motor shaft, this results in the beam being continually interrupted, and a resultant string of pulses produced by the opto receiver.



Opto Sensor PCB Mounted To Motor



Close Up Of Opto Sensor PCB

Cont....

The pulses produced by the opto receiver are monitored by the circuitry of the motor control PCB. This control circuit basically monitors for a given number of pulses within a set time frame. Should this number of pulses decrease beyond the tolerated amount, the supply to the motor is immediately switched off via a solid state relay.

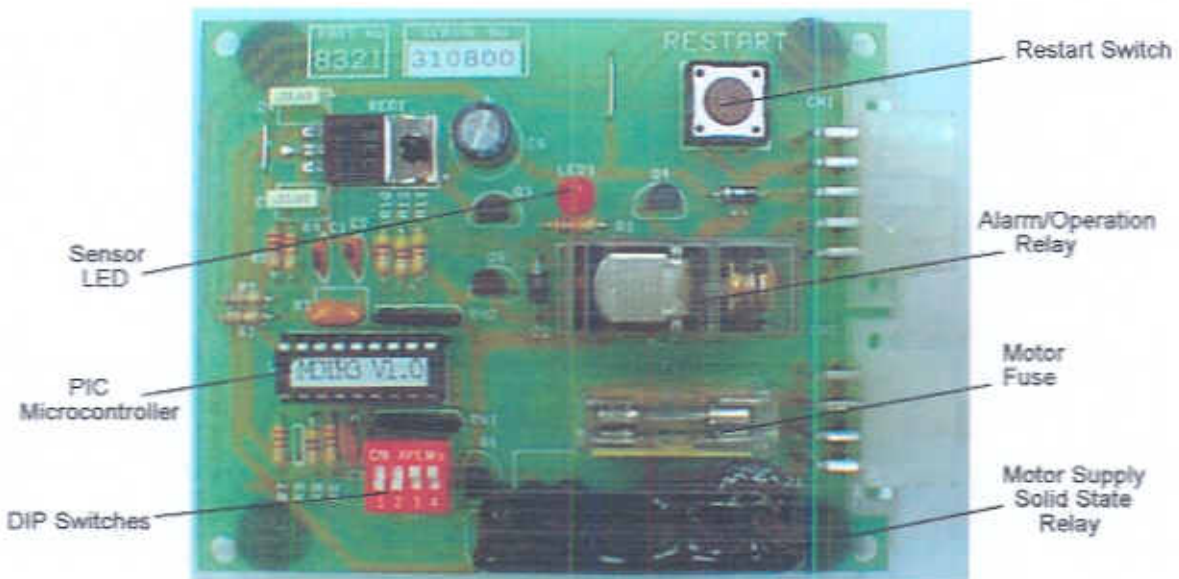
The control of the motor cut off point may be set by way of a 4 way DIP switch thus:

<u>Pole</u>	<u>1</u>	<u>2</u>	<u>Response</u>
	off	off	Fastest
	on	off	2nd Fastest
	off	on	2nd Slowest
	on	on	Slowest

<u>Pole</u>	<u>3</u>	<u>4</u>	<u>Stop Resistance</u>
	off	off	Weakest
	on	off	2nd Weakest
	off	on	2nd Hardest
	on	on	Hardest

Motor Control PCB

When the system operates and stops the motor, the supply to the motor remains off until manual reset is initiated. This creates the opportunity to ensure the machine is in a safe state to re-start; a visual check by the attendant ensuring that there is no longer any item causing the obstruction. Reset of the system is done by depressing the 'Restart' switch on the Motor Control PCB or by way of the remotely located reset switch (Refer to specific machine manuals).



There is an LED on the Motor Control PCB which indicates the output of the opto-sensor. In normal operation this will appear to be continuously ON, due to the high repetition rate of the pulses. This facility may be used to check the operation of the sensors, by manually rotating the motor shaft and observing the LED. The LED should turn on then off as the hole in the shaft passes between the sensors.

The 20mm fuse on this PCB is to provide over current protection to the solid state relay/motor combination (Refer to specific machine manuals for type and rating).

The other relay (RL1) is used to provide a switching function upon system operation which is used for signaling to other circuits for alarm operation etc.

8.2 Hoppers

Specification

There are four hoppers (SH-400 type) used in Deep Sea Treasures, they are manufactured by Asahi-Seiko and stored under the following part numbers:

8806 (10p Hopper)

8732 (2p Hopper)

Maintenance

Removing/Replacing the Hopper Bowl

To remove the bowl, depress the bowl lock pin located below the lower edge of the bowl and turn the bowl clockwise. Lift the bowl clear of the retaining pins. Replacement is a reversal of the removal operation.

Removing/Replacing the Coin Disc

With the hopper bowl detached, remove the large domed head screw in the centre of the disc. The disc (part 39) can now be lifted off and replaced if required.

Safety and Maintenance

Machine must be disconnected from the power source when the host machine is opened for servicing. *Removal of the hopper connector, without first disconnecting the power source, may result in damage to the optical sensors.*

Over-current protection is not provided on the mechanism. Fusing is provided by resettable fuses in the power supply.

The mechanism control board detects a stall situation and initiates motor reversals to free jams. If this condition exceeds 10 seconds or the hopper is empty the machine will go into an alarm condition to prevent motor damage.

Servicing and maintenance staff must be adequately trained and aware of the hazards arising from the rotating disc. Fingers, long hair and loose clothing, including ties, must be kept clear at all times.

Avoid handling the unit by the bowl only, as this could become detached if not correctly located, thus causing possible injury or damage.

Cont...

Avoid the inclusion of foreign objects such as elastic bands, paper clips and screws in the hopper bowl during operation.

Regular cleaning of optical sensors is advisable to prevent miscounting.

When cleaning the bowl, use a diluted neutral detergent and dry with a clean cloth.

Wiring errors are a common cause of problems, particularly with the sensors which can be damaged with a relatively small voltage overload.

9 Spare Parts List

This spares list is by no means fully comprehensive. The following are some of the more commonly required items that you may need. If the item you require is not listed, please contact your distributor.

<u>Description</u>	<u>Stock Number</u>
201 lock & keys	6278
301 lock & keys	6087
Motor control board	8321
Motor Opto board	8318
Hopper (10p)	8806
Hopper (2p)	8732
- Pin Sensor PCB	23175
Logic PCB	23176
- H-Bridge PCB	23174
- Audio Amplifier	23173
26" TFT Screen	23171
Audio Speaker	22134
PC	23172
(Please specify game and price of play when ordering)	