A GRAND New Winner

Video Submarine Mission
To Sink The Enemy Fleet!

Players take command to destroy enemy ships along the horizon on a rolling screen. It's an exciting battle against time and obstacles. U-Boat skippers sight targets through scope using firing handles to raise, dive and maneuver the sub in 180° swing.

Aim and fire torpedoes! Direct hits send blazing ships to the bottom of the sea. Top row targets score higher points. Voice alarm warns of sub chaser attack. Dive...but watch out for mines and depth charges. Destroy sub chaser for extra bonus points. Extended play and bonus time adjustable. If player's sub is hit, it sinks, explodes and releases an oil slick.

The Grand UP SCOPE features realistic graphics and sound effects. Takes up little space with great returns in any location. Special built-in pull-out step for shorter players.

Join the UP SCOPE crew for deep sea, money making, play action opportunities.

See your distributor or call us!

GRAND PRODUCTS, INC.
775 Nicholas Blvd.
Elk Grove Village, II. 60007
Phone: (312) 593-2770

Dimensions:
21" W x 30.5" D x 77.5" H

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WARNING
THIS GAME MUST BE GROUNDED. FAILURE TO DO SO MAY RESULT IN DESTRUCTION TO ELECTRONIC COMPONENTS.
INSTALLATION

1. Adjust 4 (four) provided leg levelers on bottom of cabinet. (Installed at factory)

2. The 117VAC power is controlled by a switch located on top of cabinet.

3. Plug line cord into 117 volt 60 cycle grounded outlet.

VOLUME CONTROL POTS

1. Located in cash box area left side and controls volume of all sounds. Sounds may be varied by rotating pot control.

GAME ADJUSTMENTS

1. Refer to self test menu for battery back up operators settings.

REMOVING FRONT VACCUM/PERISCOPE ASSEMBLY

1. Remove all screws (10) holding front vaccum assembly to access periscope, mirrors, speakers, lamps and sight assembly.
GAME OPERATION

CREDIT
1. After power up sequence coins can be deposited and 1 player game can be played. Adding additional coins will accumulate credits as shown on screen.

STARTING GAME
1. Pressing Fire button starts game.
2. Various ship targets move across the monitor screen when viewed through periscope.
3. Game timer (adjustable) starts count down and pressing Fire button will shoot torpedoes.
4. Steering periscope and hitting or sinking ships the game will score points.
5. The underwater submarine will steer left and right when moving periscope. Pressing left handle buttons submarine will go up or down.
6. Press Fire button to shoot underwater missile at sub chaser.
7. When a certain score is made the Bonus time feature will add additional time. The Bonus time feature is adjustable.
8. The ten top high scores will be displayed on the high score screen with player initials.

9. Good Luck
INSTRUCTIONS AND SCORE VALUES

• DEPOSIT COIN.
• PRESS FIRE BUTTON TO START GAME.

SURFACE SCENE
• LOOK THRU VIEWER AND MOVE PERISCOPE RIGHT OR LEFT TO SELECT TARGETS.
• PRESS FIRE BUTTON TO SHOOT TORPEDOES.
• SHIPS WITH HIGHEST TARGET VALUE APPEAR IN TOP ROW.
• SUB CHASER APPEARS AT ENEMY RIGHT LEFT COMMAND; IF NOT SUNK, SUBMARINE IS FORCED TO DIVE UNDERWATER.

UNDERWATER SCENE
• MOVE SUBMARINE - RIGHT, LEFT, UP OR DOWN TO AVOID MINES AND DEPTH CHARGES.
• POSITION SUBMARINE UNDER SUB CHASER AND FIRE TORPEDO AT READY TO FIRE COMMAND.
• SUBMARINE RESURFACES AFTER DAMAGE IS REPORTED OR SUB CHASER IS SUNK.
• GAME ENDS WHEN SUBMARINE RECEIVES ADDITIONAL DAMAGE AND SUNK, OR GAME TIME RUNS OUT.

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TARGET VALUES

TOP ROW
SUB CHASER 4500 PTS.
CARRIERS 1500 TO 6000 PTS.
SUBMARINES 750 TO 3000 PTS.
OTHER SHIPS 600 TO 2400 PTS.

2ND ROW
SUB CHASER 4500 PTS.
SUBMARINE 750 TO 3000 PTS.
OTHER SHIPS 450 TO 1800 PTS.

3RD AND 4TH ROWS
SUB CHASER 4500 PTS.
ALL SHIPS 300 TO 1200 PTS.

UNDERWATER
SUB CHASER 4500 PTS.

BONUS TIME LEVELS
16,000 PTS.
35,000 PTS.
70,000 PTS.
100,000 PTS.
125,000 PTS.
150,000 PTS.

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TARGET VALUES AND HIT REPORT

All ships will score three values when hit except the sub chaser which always scores 4500 points.

The lowest value is on the 1st hit when it is off center. A 2nd hit will score higher and a dead center hit sinks the ship immediately.

The score screen displays ship hit values and hit report screen displays how many 1st, 2nd, and center hits are made.

NOTE-

The sub chaser always sinks on the 1st hit.

TARGET VALUES

SUB CHASER 4500 PTS.
CARRIERS 1500 TO 6000 PTS.
SUBMARINE 750 TO 3000 PTS.
OTHER SHIPS 300 TO 2700 PTS.
HIGH SCORE FEATURE

The top ten scores will be displayed on the high score screen. Top ten high scores will also display three initials for each high score.

If the current score is greater than the 10th high score on the high score screen the player is asked to enter his initials next to his score.

The screen format will be similar to the following:

<table>
<thead>
<tr>
<th>INITIALS</th>
<th>HIGH SCORES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B A D</td>
</tr>
<tr>
<td>2</td>
<td>C C C</td>
</tr>
<tr>
<td>3</td>
<td>F A R</td>
</tr>
<tr>
<td>4</td>
<td>Y E S</td>
</tr>
<tr>
<td>5</td>
<td>A D D</td>
</tr>
<tr>
<td>6</td>
<td>W E R</td>
</tr>
<tr>
<td>7</td>
<td>S A Q</td>
</tr>
<tr>
<td>8</td>
<td>E A R</td>
</tr>
<tr>
<td>9</td>
<td>P A T</td>
</tr>
<tr>
<td>10</td>
<td>J A K</td>
</tr>
</tbody>
</table>

CONGRATULATIONS YOUR SCORE WAS 108 000

ENTER YOUR INITIALS A _ _

TURN PERISCOPE TO CHANGE LETTER

PRESS FIRE BUTTON TO PICK A LETTER
INTRODUCTION

The most common problems occur in the harness area such as the coin door, player controls, interconnect wiring etc. The TV monitor trouble shooting will not be covered in this manual. This information can be obtained from Wells Gardner. (Telephone 312-252-8220)

The Logic PC board is a complex device and should be handled with care.

GENERAL SUGGESTIONS

The first in trouble shooting procedure is correctly identifying the malfunction symptoms. A careful trained eye will see additional clues.

After all the clues are carefully considered, the possible malfunctioning areas can be narrowed down to one or two good suspects. Those areas can be examined until the cause of the malfunction is discovered.

HARNESS COMPONENT TROUBLE SHOOTING

Possible problems in this area are coin, credit, power, lights and failure of certain features.

NO COIN OR CREDIT

A coin is inserted and a game is not awarded. First check to see if the coin is in the return cup. If the coin has returned the problem would be in the coin acceptor only. Next clean and inspect the coin acceptor and try with coins. Make adjustments or replace coin acceptor.
NO CREDIT AND COINS GO INTO CASH BOX

In this case you have a coin switch failure or an electrical failure of the coin/start circuit. First examine the coin switch wire form, stroke and wire connections. Then check coin switch for continuity with Ohm meter. If coin switch checks out proceed to the wiring between coin door and logic board.

If the above checks out the trouble must be in the coin/credit circuits of the logic board.

TRANSFORMER AND LINE VOLTAGE

Your game must have the correct line voltage to operate properly. No game will function below 105VAC. In any case the best way to check for correct line voltage is with your volt meter. Set the meter to the next higher scale above 117VAC and stick your probes in the wall outlet. If it is good here check the 117VAC transformer wiring, solder connections, fuse block, on/off switch, switch and wiring harness.

The transformer must be correctly grounded to prevent a hum bar, rolling up or down the TV screen.

HARNESS PROBLEMS

Additional harness problems can be fuses blowing and malfunctioning control.

The best way to approach this problem is by turning the power off and disconnecting devices that may be causing the condition such as the monitor, PC boards and controls. Disconnect the devices by pulling off the connectors and
connecting your volt meter across the fuse that is blowing (Power turned off) and set your meter to a resistance scale. This will save blowing fuses each time you check the circuit for a short. If the meter reads no short with all connectors removed, re-connect the devices one at a time until the meter reads a short. The last device connected caused the short. If the meter reads a short with all devices disconnected then the short is caused by the harness cable which may be pinched somewhere.

MALFUNCTION CONTROLS

The most common problem here would be a bad potentiometer, switch, connector or wiring. A bad pot is normally replaced and switches readjusted, cleaned or replaced. Check for pinched, broken and wire soldering. Also check wiring from controls to logic board using volt meter. If everything checks out, your trouble is in the logic board circuits.
SELF TEST

There are a series of diagnostic screens that allows the logic system to be tested and aid game alignments.

To enter self test locate the red push button in the cash box area.

Turn game off and on and hold red push button during the entire test. The game will enter the self test mode and the first screen will be the self test menu.

Steering the periscope will allow you to choose each self test from the menu as they change color. (1 to 7)

Press the Fire button and the choosen test will appear.

MENU

1 POT (CALABRATION)
2 BUTTONS (SWITCH TEST)
3 LAMPS
4 SOUNDS
5 RESET H (HIGH SCORES)
6 CROSS HATCH
7 OPERATOR SETTINGS

When the self test red push button is released and power is turned off and on then game will return to the play mode.

1. POT

The pot value will be displayed on the screen and by turning the periscope the pot value will be 0 with the periscope to the right and 225 to the left.
SELF TEST

There are a series of diagnostic screens that allows the logic system to be tested and aid game alignments.

To enter the self test locate the slide switch in the cash box area.

When in game over mode move the self test switch to the test position. The game will enter the self test mode and the first screen will be the self test menu.

Steering the periscope will allow you to choose each self test from the menu as they change color. (1 to 7)

Press the FIRE button and the choosen test will appear.

MENU

1 POT (CALABRATION)
2 BUTTONS (SWITCH TEST)
3 LAMPS
4 SOUNDS
5 RESET H (HIGH SCORES)
6 CROSS HATCH
7 OPERATOR SETTINGS

When the self test switch is moved to the play position during the menu display the game will return to the play mode.

1. POT

The pot value will be displayed on the screen and by turning the periscope the pot value will be 0 with the periscope to the right and 225 to the left.
A bad pot will cause the number sequence to be jumpy.

2. **BUTTONS** (SWITCH TEST)

   The screen will display the following:
   
   FIRE
   UP
   DOWN
   COIN 1
   COIN 2

   The button or switch tested will change color on the screen when operating properly.

   Press the FIRE and UP buttons together to return to the menu.

3. **LAMPS**

   Move the periscope to choose one of the following displayed on the screen.
   
   ENEMY RIGHT
   ENEMY LEFT
   TORP 1
   TORP 2
   TORP 3
   TORP 4
   SIGHT
   BUBBLE LIGHT

   The lamp lights when chosen and the option will change color on the monitor.

   Press the FIRE button to return to the main menu.
4. **SOUNDS**

Move the periscope to choose one of the following displayed on the screen.

- CHANNEL 1 RIGHT SPEAKER
- CHANNEL 2 RIGHT SPEAKER
- CHANNEL 3 LEFT SPEAKER
- CHANNEL 4 LEFT SPEAKER

The option chosen will change color.

The voice for mission over is heard continuously every two seconds out of the chosen channel.

Press the FIRE button to return to the main menu.

5. **RESET H**

The top ten high scores displayed on the high score screen will change when they are beat.

Reset H will reset high scores back to the original scores when FIRE button is pressed.

6. **GRID DISPLAY**

This test will display a cross hatch pattern used in adjusting the color monitor. The cross hatch may be used to adjust color, vertical linearity, convergence and vertical-horizontal size.

Press FIRE button to return to main menu.
7. **OPERATORS SETTINGS**

Move the periscope to choose one of the following displayed on the screen.

<table>
<thead>
<tr>
<th>COIN - START</th>
<th>1/1</th>
<th>2/1</th>
<th>3/1</th>
<th>1/2</th>
<th>FREE</th>
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</thead>
<tbody>
<tr>
<td>START - TIME</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
</tr>
<tr>
<td>BONUS - TIME</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>35</td>
<td>40</td>
</tr>
</tbody>
</table>

The option chosen will change color and pressing the FIRE button will lock in the chosen option.

Press the FIRE button once more and return to the main menu.

When the self test switch is moved to the play position during the menu display the game will return to the play mode.
PERISCOPE STEERING POT ALIGNMENT

1. Loosen periscope steering pot set screw.

2. Move and sight periscope to aim at the center of the monitor and start game.

3. Manually turn the periscope steering pot shaft until the compass reading on the monitor screen reads N (North) and tighten the set screw with the periscope dead center.

4. Steer the periscope full left and the compass should read W (West).

5. Steer the periscope full right and the compass should read E (East).

6. Start game and fire torpedoes at ships, check scrolling effect.
T.V. MONITOR

Warnings

1. Power Up Warning
   Caution: If the monitor is to be powered up outside of the games console, an isolation transformer must be used for the AC power source.

2. X-Radiation
   This chassis has been designed for minimal x-radiation hazard. However, to avoid possible exposure to soft x-radiation it is IMPERATIVE that the EHT circuitry IS NOT modified.

3. High Voltage
   The colour monitor contains HIGH VOLTAGES derived from power supplies capable of delivering LETHAL quantities of energy. To avoid DANGER TO LIFE, do not attempt to service the chassis until all precautions necessary for working on HIGH VOLTAGE equipment have been observed.

4. CRT Handling
   The picture tube encloses a high vacuum and due to the large surface area is subject to extreme force. Care must be taken not to bump or scratch the picture tube as this may cause the tube to implode resulting in personal injury and property damage. Shatter-proof goggles must be worn by individuals while handling the CRT or installing it in the monitor. Do not handle the CRT by the neck.

5. To prevent fire or shock hazard DO NOT EXPOSE THIS MONITOR TO RAIN OR MOISTURE.
COLOR MONITOR SETUP INSTRUCTIONS

1. HORIZONTAL FREQUENCY

With the monitor being driven with the display signal, connect one jumper between TP1 and TP2 and another jumper between TP3 and TP4. Adjust the horizontal hold control until the picture stops sliding horizontally. Remove the jumpers. Do not use the horizontal hold control for horizontal centering. (See #3)

NOTE: If the sync signal is composite, use the horizontal sync input of the same polarity as the composite sync signal.

2. PICTURE SIZE

Adjust the vertical size control, and the horizontal width coil for desired picture size.

3. PICTURE CENTERING

If the video is off center vertically, turn the vertical raster position control to move the raster up or down. If the video is off center horizontally adjust the horizontal video shift control to center the picture. If any additional horizontal positioning is required, move the horizontal raster position jumper to the left or right position.

4. BRIGHTNESS

Adjust the brightness control to obtain the proper illumination. Adjust this control such that the illumination is just barely extinguished from portions of the display which should be black.

5. CONTRAST CONTROL

Adjust the contrast control for the desired picture intensity.

6. FOCUS

Adjust the focus control for the best overall definition and fine picture detail.
GAME I AND O SCHEMATIC WILL BE AVAILABLE SOON
EPROM BOARD SCHEMATIC

WILL BE AVAILABLE

SOON

-18-
### I AND O BOARD PC 0103-90

<table>
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<td>8255</td>
<td>PARALLEL PORT (PP1)</td>
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<tr>
<td>8416</td>
<td>RAM 2K X 8</td>
</tr>
<tr>
<td>74LS00</td>
<td>2 INPUT NAND</td>
</tr>
<tr>
<td>74LS04</td>
<td>HEX INVERTER</td>
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<tr>
<td>74LS374</td>
<td>FLIP-FLOP (LATCH)</td>
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### ADDITIONAL DEVICES

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<tr>
<th>TIP 120</th>
<th>FUNCTION</th>
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<tr>
<td>TDA 2003</td>
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<td>IN 5400</td>
<td>POWER AMP</td>
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<td>74LS32</td>
<td>4 INPUT OR</td>
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<td>74LS123</td>
<td>MULTI-VIBRATORS</td>
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<td>74LS138</td>
<td>3-8 LINE DECODER</td>
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<td>2-4 LINE DECODER</td>
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<tr>
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<td>Red Push Buttons</td>
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<tr>
<td>Sighting Mirror</td>
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<td>Steering Pot (1 MEG)</td>
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NOTES

This space is provided for personal notes