SPINAL BREAKERS

Manual

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SPINAL BREAKERS OVERVIEW

A Hildriod is a living organism developed by humans.

As submissive as robots, they are used to carry out dangerous tasks instead of humans.

Several years later, a nuclear war breaks out for unknown causes. As a result of this war, several shifts in the earth's axis occur and the Hildroids, affected by the radiation, undergo major alterations. They become able to think and move with their own will and soon they start to kill their human hosts.

It's now several decades later and everything is normal at the space station for artificial hibernation testing. On board is Captain Waffle who has just woken from his from his frozen sleep.

Meanwhile back on earth, with the alterations in the earth's axis, animals and people appear from the past and become hosts to the Hildroid robots. The Hildroids begin to interfere with the histories of their hosts.

Captain Waffle, judging that the next shift in the earth's axis will cause major alterations in earth's history, descends to earth in a one-man escape ship.

EXPLANATION OF GAME PLAY

To operate Captain Waffle: Aim cursor at target using the joystick and begin the attack using the appropriate buttons. Use the Shot Button to shoot out normal rounds and the Dodge Button to avoid enemy attack. You can also launch grenades with the Bazooka Button. Shoot at enemies or objects in order to uncover various items. After you pick up an item, you are awarded power-ups such as "Grenade Supply", "Target Expansion", "Rapid Fire" and "10 Second Invincibility". When life meter reaches 0, the game is over. To continue, deposit coins in corresponding coin slot (left slot for left player, right slot for right player.)

CONTROLS

Each player controls one 8-way joystick and three buttons. One button for firing, one for dodging enemy fire and one for bazooka fire.

KIT CONTENTS

Spinal Breakers PCB
Control panel overlay
Button labels
JAMMA wiring harness
Eight-way joysticks (2)
Microswitch buttons (8)

Spinal Breakers marquee
Monitor bezel
Instruction label
FCC compliance sticker
Instruction manual

POWER REQUIREMENTS

+5 volts DC @ 7 amps
+12 volts DC @ 1 amp

MONITOR REQUIREMENTS

This game requires a horizontally mounted raster scan monitor with negative composite sync.

F.C.C. REGULATION COMPLIANCE

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a class "A" computing device pursuant to subpart J of Part 15 of the F.C.C. rules which are designed to provide reasonable protection against such interference when operated in commercial environment. The F.C.C. require that the sticker included with this kit must be placed on the back of the machine or elsewhere visible when inspected.

WARRANTY INFORMATION

American Sammy warrants to the original purchaser that the PCB is in good working condition for a period of 90 days from receipt of the product. Should this product, in American Sammy's opinion, malfunction within the warranty period because of a defect in design, materials, or workmanship, American Sammy will repair of replace the product without charge under the terms listed below. Replacement of either the hardware product of its component parts will be only on an exchange basis. This warranty does not apply to those products which have been damaged due to accident, abuse, improper installation, natural disaster, or unauthorized repairs or modifications.

CONVERSION PROCEDURE

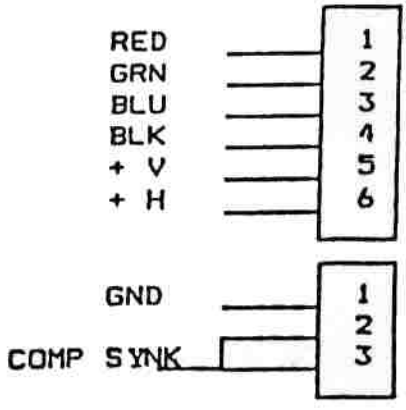
1. PREPARING THE CABINET

   A. Remove the old circuit board.
   B. Remove the control panel, marquee, and any side graphics.
   C. Remove the old wiring harness being careful to leave the A/C wiring to monitor, power supply, on/off switches, and transformer circuitry.
   ****NOTE:** If the game being converted is "JAMMA" standard, no rewiring is necessary, simply plug Spinal Breakers into the existing harness.
   D. Clean the cabinet thoroughly an repair any visible cabinet defects. Painting the cabinet will give your game a "new game" look and will enhance the earning power of your game.
   E. If the monitor glass or plexi is scratched it should be replaced.

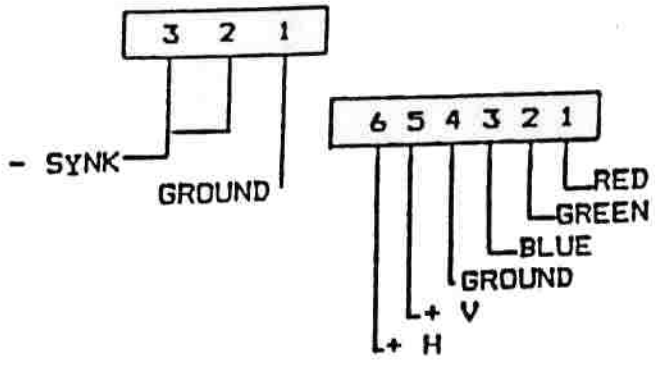
2. KIT INSTALLATION

   A. Securely mount the PCB to the inside of the cabinet.
   B. Attach the wiring harness to the PCB. The JAMMA label on the connector should face the component side of the PCB.
   C. Route the wires labeled "VIDEO" up to the monitor. Connect the wires to the monitor's main circuit board, as shown below.

Red Wire ------- Video Red
Green Wire ------ Video Green
Blue Wire ------- Video Blue
Black Wire ------ Video Ground
White Wire ------ Negative Composite Sync



WELLS GARNER



ELECTROHOME

D. Route the wires labeled "POWER' to the power supply. Connect them as follow:

Red Wire ----- +5VDC
Yellow Wire -- +12VDC
Black Wire --- Ground

The blue wire is for -5VDC which is not required for this game. You can use the -5V to power the coin door lights if desired.

E. Find the two wires labeled "SPEAKER" and connect to the speaker. If the sound is scratchy or distorted, try reversing the wires.

F. Find the wires labeled "COIN" and route to the coin door. Coin switch 1 and 2 are wired to N.O. (normally open) terminal of the microswitch. A ground wire will go to the common terminal.

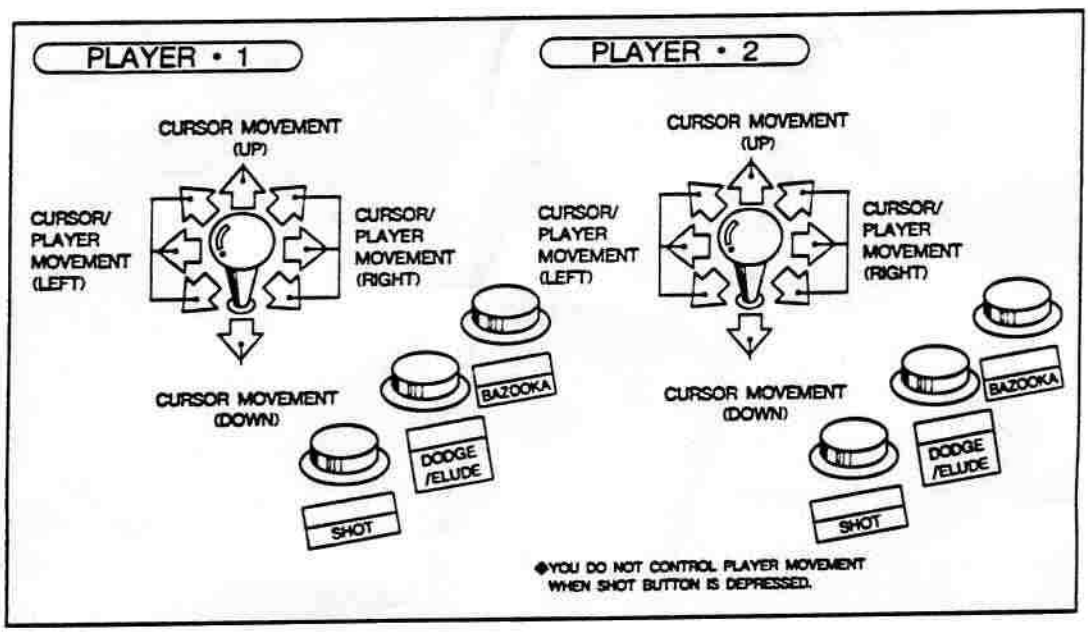
3. CONTROL PANEL

A. Remove the old control panel buttons and joystick(s). Do not remove the old overlay until the new holes have been drilled.

B. Mark and drill the new holes. File any burrs so that the control panel surface is smooth. Remove the old overlay

C. Peel the top half of the protective backing off of the new overlay. Start from the center and smooth the overlay as you go. Leave about one inch of the overlay coming off the top of the control panel. Cut off the excess with a razor.

CONTROL PANEL LAYOUT



E. Adhere the control panel function labels.
F. Install the new buttons and joysticks.
G. Hook up the control panel wires. Use the existing control panel harness if possible.

4. MARQUEE INSTALLATION

A. Use the original marquee as a template. Score the new marquee deeply and break off the excess with pliers. Before installing the new marquee, make sure the light fixture behind it is working.

TROUBLE SHOOTING

1. NO SOUND, NO PICTURE
   * Check for +5 volts at pin #4 (red) and pin #1 (black) with a voltmeter.
   * Refer to monitor manual and check monitor for proper voltage.

2. GAME HAS SOUND BUT NO PICTURE
   * Check AC supply to monitor
   * Check 5 wires to monitor: red, green, blue, sync, and monitor ground.

3. GAME HAS PICTURE BUT NO SOUND
   * Check the two speaker wires. (Pin #10 and L)
   * Check for +12 volts at pin #6.
   * Make sure both speaker wires are isolated from ground.

4. GARBAGE ON THE SCREEN
   * Adjust power supply so that you have exactly +5 volts at pin #4.
   * Make sure all socketed EPROMS are securely seated.

5. PICTURE SCROLLS
   * Recheck connections of SYNC and GROUND between the monitor and the edge connector.
   * Change sync polarity of your monitor by using a 74LS-04 invertor.

6. PICTURE UPSIDE DOWN
   * See dip switch settings in this manual for screen inversion.

Connector Diagram

Solder side		Parts side
GNE	1	GND
GND	2	GND.
+5V	3	+5V
+5V	4	+5V
	5	
+12V	6	+12V
	7	
	8	
	9	
SPEAKER(−)	10	SPEAKER(+)
	11	
GREEN	12	RED
SYNC	13	BLUE
SERVICE	14	GND
	15	TEST
COIN 2	16	COIN 1
2P START	17	1P START
2P UP	18	1P UP
2P DOWN	19	1P DOWN
2P LEFT	20	1P LEFT
2P RIGHT	21	1P RIGHT
2P PUSH A	22	1P PUSH A
2P PUSH B	23	1P PUSH B
2P PUSH C	24	1P PUSH C
	25	
	26	
GND	27	GND
GND	28	GND

** COIN Specifications 1 and 2

SPECIFICATION 1 :

1P AND 2P CAN BE STARTED SEPARATELY BY INSERTING COINS INTO EACH SLOT.

SPECIFICATION 2 :

ADDITIONAL COINS INTO EACH SLOT CAN BE CONVERTED FOR CREDIT TO INCREASE THE LIFE OF THE PLAYER.

DIP SW 1

COIN/CREDIT		COIN 1				COIN 2			
		1	2	3	4	5	6	7	8
1COIN	1CREDIT	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1COIN	2CREDITS	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
1COIN	3CREDITS	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
1COIN	4CREDIT	ON	ON	OFF	OFF	ON	ON	OFF	OFF
1COIN	5CREDITS	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
1COIN	6CREDITS	ON	OFF	ON	OFF	ON	OFF	ON	OFF
2COINS	1CREDIT	OFF	ON	ON	OFF	OFF	ON	ON	OFF
3COINS	1CREDIT	ON	ON	ON	OFF	ON	ON	ON	OFF
4COINS	1CREDIT	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
5COINS	1CREDIT	ON	OFF	OFF	ON	ON	OFF	OFF	ON
2COINS	3CREDITS	OFF	ON	OFF	ON	OFF	ON	OFF	ON
2COINS	1CREDIT 4COINS 2CREDITS 5COINS 3CREDITS 6COINS 4CREDITS	ON	ON	OFF	ON	ON	ON	OFF	ON
2COINS	1CREDIT 4COINS 3CREDITS	OFF	OFF	ON	ON	OFF	OFF	ON	ON
1COIN	1CREDIT 2COINS 2CREDITS 3COINS 3CREDITS 4COINS 4CREDITS 5COINS 6CREDITS	ON	OFF	ON	ON	ON	OFF	ON	ON
1COIN	1CREDIT 2COINS 2CREDITS 3COINS 3CREDITS 4COINS 5CREDITS	OFF	ON	ON	ON	OFF	ON	ON	ON
1COIN	1CREDIT 2COINS 3CREDITS	ON	ON	ON	ON	ON	ON	ON	ON

DIP SW 2 **

		1	2	3	4	5	6	7	8
Difficulty	Normal	OFF	OFF						
	Normal	ON	OFF						
	Easy	OFF	ON						
	* Hard	ON	ON						
COIN Specifications	* 1			OFF					
	2			ON					
Flip Flop	* Off				OFF				
	On				ON				
Lever	* Digital					OFF			
	Analog					ON			
Test Mode	* Off						OFF		
	On						ON		
Energy	* 32point							OFF	
	40point							ON	
Restoration	10point								OFF
	* 5point								ON

* indicates factory suggested settings