



JANUARY 1998
16-34035-101



UNIVERSAL KIT

OPERATION MANUAL

Operation & Adjustments • Testing & Problem Diagnosis
Parts Information • Wiring Diagrams

WARNINGS & NOTICES

WARNING

USE OF NON-ATARI PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY ATARI AUTHORIZED PARTS.

* Substitute parts or modifications may void EMC directive or FCC type acceptance.

* For safety and reliability, substitute parts and modifications are not recommended. Use only ATARI authorized components and parts. Failure to do so will void warranty and may result in incorrect and/or unsafe operation.

* This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under federal law. This also applies to ATARI logos, designs, publications and assemblies. Moreover, facsimiles of ATARI equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with ATARI components.

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SURF PLANETTM KIT

SECTION ONE

INSTALLATION

Warning

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SAFETY NOTICES

The following safety instructions apply to all operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page before preparing your game for play.



CAUTION

HANDLING ELECTRONIC DEVICES: Observe the following precautions for handling electronic devices.

- 1) Ensure that the A.C. power to the game is turned off prior to servicing the electronics.
- 2) Discharge any static electricity build up in your body by touching a safety ground point such as the power supply chassis. This must be done **BEFORE** touching or handling the electronic assemblies.
- 3) Store the electronic assemblies in an anti-static area. Anti-static bags must be used to store the CPU board assembly. Use the same bag to save the old CPU assembly after the new unit is installed.
- 4) **DO NOT** remove or connect any electronic assemblies when the cabinet power is on. Doing so will damage the electronic assemblies and void the warranty.

DISCONNECT POWER DURING INSTALLATION OR REPAIRS. Always turn your game OFF and unplug it before attempting to service or install your kit. Installing or repairing PC boards with power ON can damage components and void the warranty. Be sure that all ground wires are installed securely.

PROPERLY GROUND THE GAME. To avoid electrical shocks, do not plug in the game until it has been inspected and properly grounded. This game should only be plugged into a grounded 3-wire outlet. Do not use a "cheater" plug or cut off the ground pin on the line cord.

USE PROPER FUSE. To avoid electrical shock, all replacement fuses must match the original fuse in fuse type, voltage rating, and current rating. Do not substitute slow blow fuses for other fuse types.

SALVAGED PARTS. Parts salvaged from old games are required to complete your kit. These salvaged parts must operate perfectly; otherwise, the converted game cannot perform properly or safely. Always repair circuit board malfunctions and cabinet damage before conversion is attempted.

POWER SUPPLY. Be sure the power supply from your old game is capable of +5Vdc at 8A, -5Vdc at 1A, and +12Vdc at 3A. All power supply voltages are $\pm 5\%$ under load. These operating voltages are necessary for the kit. Your power supply must be FCC approved to avoid possibility of radio interference.

WIRING. This kit uses as much of the existing wiring as possible. To avoid errors in operation, verify that the wiring is an exact match with the diagrams after the conversion is completed.

EMISSION CONTROL COMPONENTS. Failure to install filter devices, ferrite beads, ground wires, or metal shields or covers exactly as instructed may result in radio frequency interference.

SPEAKERS. This kit uses a stereo speaker system handling at least 10 WATTS. A separate woofer (not included) may be used with this game. When used, the woofer speaker must handle at least 20 WATTS.

MONITOR. This kit is not intended for use with X-Y monitors. Suitable monitors have horizontally mounted CRTs and raster electronics with inputs for RGB video and COMPOSITE NEGATIVE SYNC.

COIN MECHANISMS. Be sure to clean and test your game coin mechanisms with known currency. Servicing of these mechanisms is crucial to your game's earning potential and operation.

COIN METERS. Coin meters are not provided with this kit. Wiring information is provided as a convenience to the operator. Existing meters may be used provided their operation is verified.

HANDLE FLUORESCENT TUBE AND CRT WITH CARE. If you drop a fluorescent tube or a CRT and it breaks, it will implode! Shattered glass can fly eight feet or more from the implosion.

PRODUCT SPECIFICATIONS

Player Variables

1 or 2 players per game
Choice of Surfer and course
High Score Recognition

Operator Variables

Coinage, Game Options,
Linking, Volume Level,
Audits, Statistics

Diagnostics

Automatic Power-Up Self-Test
Manual Multi-Level Menu System

Features

Three audio channels
Optional subwoofer connection

Interconnections

Links to a second game
with optional cable

Design Type

Field Installable Kit for Stand-Up
Dedicated Video Cabinet

CABINET SAFETY REQUIREMENTS

For safe use of this game, install this kit into a standard Atari Games Corporation "family" cabinet, or into any universal game cabinet that is listed by Underwriters Laboratories.

NOTICE - FCC COMPLIANCE

**INSTALLATION OF THIS KIT INTO ANY EXISTING PRODUCT DOES NOT
GUARANTEE COMPLIANCE WITH EMC/FCC REQUIREMENTS. YOU ARE
SOLELY RESPONSIBLE FOR FCC COMPLIANCE FOR INSTALLATIONS IN
OTHER PRODUCTS. ANY EXISTING FCC COMPLIANCE STICKER MUST
BE REMOVED AND A NEW STICKER SHOULD NOT BE INSTALLED ON THE
CONVERTED PRODUCT UNTIL YOU HAVE VERIFIED FCC COMPLIANCE.**

EPILEPSY WARNING

A very small portion of the population has a condition which may cause them to experience epileptic seizures or have momentary loss of consciousness when viewing certain kinds of flashing lights or patterns that are present in our daily environment. These persons may experience seizures while watching some kinds of television pictures or playing certain video games. People who have not had any previous seizures may nonetheless have an undetected epileptic condition.

If you or anyone in your family has experienced symptoms linked to an epileptic condition (e.g. seizures or loss of awareness), immediately consult your physician before using any video games.

We recommend that parents observe their children while they play video games. If you or your child experience the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements, loss of awareness, disorientation, or convulsions, **DISCONTINUE USE IMMEDIATELY** and consult your physician.

ATTENTION

PROPERLY ATTACH ALL CONNECTORS. Be sure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slip on easily, do not force them. A reversed connector may damage your game and void the warranty. All connectors are keyed to fit specific pins on each board.

INSPECTION

Unpack the materials from the carton and inspect for obvious signs of damage. Use this checklist to be sure the kit is complete. You must supply the remainder of the materials required for this conversion.

Part Number	Item	Qty.	Function
[] A-22317	JAMMA Filter Board Assembly	1	(provides wiring harness connections)
[] A-22318	Analog Joystick Assembly	1	(player control with wiring harness)
[] H-22319	Wiring Harness-Joystick	1	(connects joystick to filter board)
[] 03-9664	Control Panel Cover	1	(protects control panel decals from wear)
[] 03-9748	Joystick Control Ring	1	(covers joystick handle hole in control panel)
[] 04-11084	Filter Board Mounting Bracket	1	(mounts filter board [part of assembly])
[] 16-8587-825	FBI Warning Label	1	(federal game protection warning)
[] 16-9478.2	Product Registration Card	1	(Registers Kit for Warranty Service)
[] 16-9922.1	Epilepsy Warning Label	1	(alerts players to epilepsy possibility)
[] 16-10077	Electronic Device Caution Sheet	1	(suggestions to avoid damaging parts)
[] 16-10139	FCC / Canada Warning Label	1	(suggestions to avoid interference)
[] 16-10419-1	AAMA Label	1	(AAMA Player Suitability Rating)
[] 16-10476	Control Panel Template	1	(guide for player control hole layout)
[] 16-34035-101	Surf Planet Kit Manual	1	(installation, operation, troubleshooting, etc.)
[] 20-10144	Tamper-Resistant T-25 Wrench	1	(tightens tamper-resistant screws)
[] 20-10209-3	Start Button (Blue)	1	(starts game and test menu items)
[] 20-10431	Joystick Grip	1	(joystick grip handle [part of assembly])
[] 20-10432	Surf Planet CPU/PCB Assembly	1	(electronic game components in enclosure)
[] 20-10433-08	Philips Pan Head M5 12mm Screw	4	(attaches joystick assembly to control panel)
[] 20-10434	Joystick Plastic Spring Holder	1	(joystick handle centering [part of assembly])
[] 31-3018	Attraction Marquee Artwork	1	(identifies game cabinet to players)
[] 31-3019	Cabinet Panel Side Decal	2	(covers existing cabinet markings)
[] 31-3020	Cabinet Panel Wallpaper Decal	1	(covers existing control panel markings)
[] 31-3021	Cabinet Panel Markings Decal	1	(identifies functions of player controls)
[] 31-3022	Game Play Instruction Decal	1	(explains game rules and player moves)
[] 4006-01005-06	6-32 x 3/8" Machine Screws	2	(for filter board bracket [part of assembly])
[] 4608-01081-11	#8 x 11/16" Hex Wood Screw	4	(mounts electronics assembly to cabinet)
[] 4700-00129-00B	Flat Washer (Black)	4	(secures joystick assembly to panel)
[] 4702-00013-00B	#10 Lock Washer (Black)	4	(secures joystick assembly to panel)
[] 5014-15362-00	Joystick Potentiometer, 5K ohm	1	(variable resistor [part of assembly])
[] 5556-13956-00	2-piece 1.25" Square Ferrite Bead	2	(controls radio frequency interference)
[] 5556-13957-00	2-piece 0.75" Square Ferrite Bead	1	(controls radio frequency interference)
[] 5556-15272-00	2-piece 0.375" Square Ferrite Bead	1	(controls radio frequency interference)

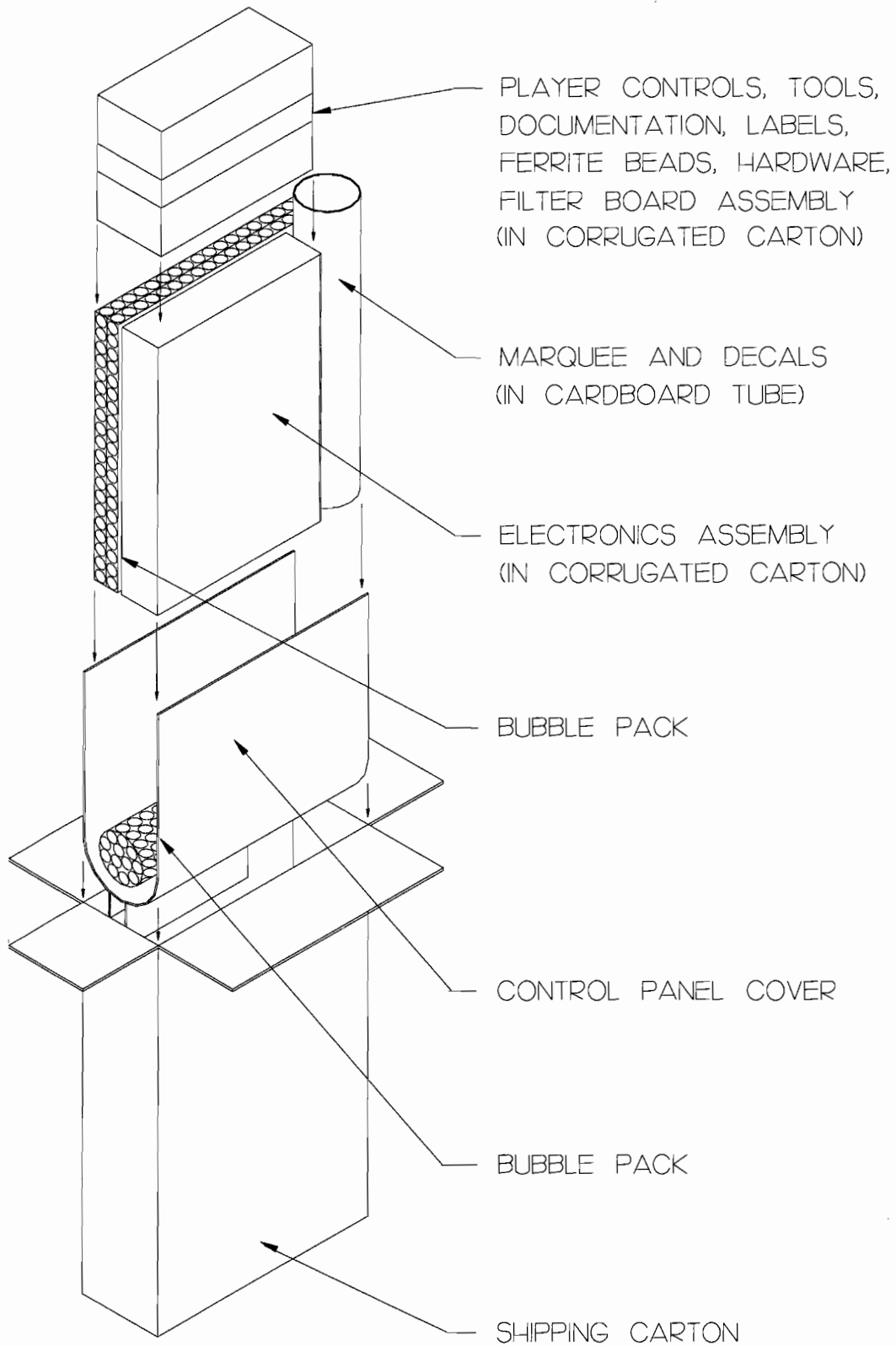
Recommended tools and supplies

[] black semi-gloss paint	[] black electrical tape
[] electric drill and wood drill bit set	[] small screw assortment
[] screwdrivers	[] razor knife
[] liquid soap (dishwashing detergent)	[] squeegee or soft sponge
[] grease pencil or marker	[] soldering iron and solder
[] nut drivers or socket wrench set	[] wire cutters
[] 180 grit sandpaper or electric sander	[] pliers
[] wood filler material (putty, glue, board, etc.)	[] hole saw or equivalent

Reference Items (This item is not included in the kit. Purchase from your local distributor as needed)

[] 20-10435	Linking Cable 15-pin D-sub 10 ft.	1	(connects two game cabinets)
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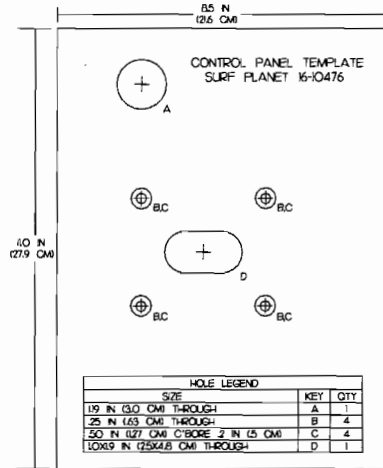
KIT PACKAGING



CABINET MODIFICATIONS

1. Verify the operation of the existing game before making any changes to the cabinet. Pay special attention to those components that will be used again after conversion is completed (Power Supply, Video Monitor, Currency Acceptors, Wiring Harnesses, Cabinet Locks, Speakers, Fluorescent Lamp, Cooling Fans, Mounting Brackets, etc.). Repair or replace damaged parts before installing the kit.
2. Switch off power to the game. Disconnect the line cord from the A.C. power. Clear the work area. Cover or protect the non-wood items (marquee, monitor, coin door, brackets, line cord, etc.).
3. Mark top edge position of decals or artwork. Remove them and clean off all glue residue. Fill gouges, unused holes, etc with quick-hardening wood putty. Sand the cabinet smooth and remove all dust.
4. Evenly cover the entire cabinet with black paint. Allow the paint to dry completely before continuing.
5. Lightly moisten the cabinet with soapy water. Remove the decal backing. Apply the graphic where the previous decal was located. Start at the top and work down. After the decal is in place, smooth it outwards, taking care to squeeze out air bubbles. If you can not remove an air bubble, pop it with a knife or pin and smooth it down. Allow at least 12 hours for the adhesive in the decal to set.
6. Remove the existing attraction shield and marquee from the game cabinet. Check the lamp and install a new one if cracks or darkened ends are found, even if it still lights at the time of inspection. Install the new kit marquee. Using the previous shield as a guide, trim the new attraction shield to size and deburr the edges. Clean the new marquee attraction shield before installing it in the game.
7. Remove the viewing glass and set it in a safe place. Clean the CRT glass and the monitor bezel. Apply the player moves and the game play instruction decals to the top and bottom of the bezel. Place the Epilepsy Warning label on the front of the monitor bezel. Place the AAMA guidelines sticker on the right-hand side of the bezel. Be sure that decals and labels do not obstruct the viewing area. Clean bezel and viewing glass before installing in the game.
8. If this kit is installed in a 25" ATARI universal family video cabinet, the FCC compliance label (16-10139) supplied may be placed on the rear of the cabinet after other existing labels have been removed. The FCC label must not be placed on the converted product until all ferrite beads and grounds have been installed exactly as instructed and compliance has been verified by FCC tests. ***Installation of this kit into any other product does not guarantee FCC requirements compliance.***
9. Remove and save the screws at the top and sides of the rear door. Unlock the rear door, then lift it off of the cabinet and set it aside. Use a vacuum cleaner to remove any dirt or debris inside the cabinet.
10. Locate the control panel latches or fasteners and free the control panel from its operating position. If there is no wiring harness connector, label each of the wires before disconnecting them from the Player Controls. Once the wires are disconnected, remove the control panel from the game cabinet. Save the mounting brackets and hardware for reinstallation after the control panel has been modified.
11. Some cabinets have speakers located on the control panel or other removable pieces of the cabinet. If speaker harnesses must be disconnected, be certain to mark polarity of wires as well as function. Incorrectly phased speakers can cause weak low frequencies or a thin, hollow sound quality.
12. This game is intended for use with a single subwoofer (woofer and wiring are not supplied with the kit). If the conversion cabinet does not have one, you may install one at this time. Minimum recommended woofer size is 6 in. (15cm) for standard cabinets; 8-10 in. (20-25cm) units may be used in larger cabinets. Choose a woofer location where the magnet will not interfere with the CRT or other game components, then cut the hole and mount the speaker using your own hardware and protective grille.

CONTROL PANEL MODIFICATIONS

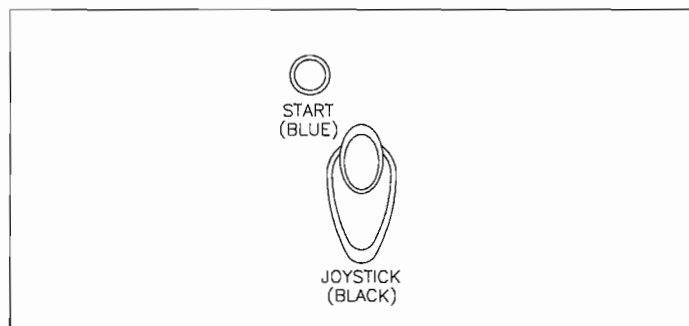


CONTROL PANEL TEMPLATE

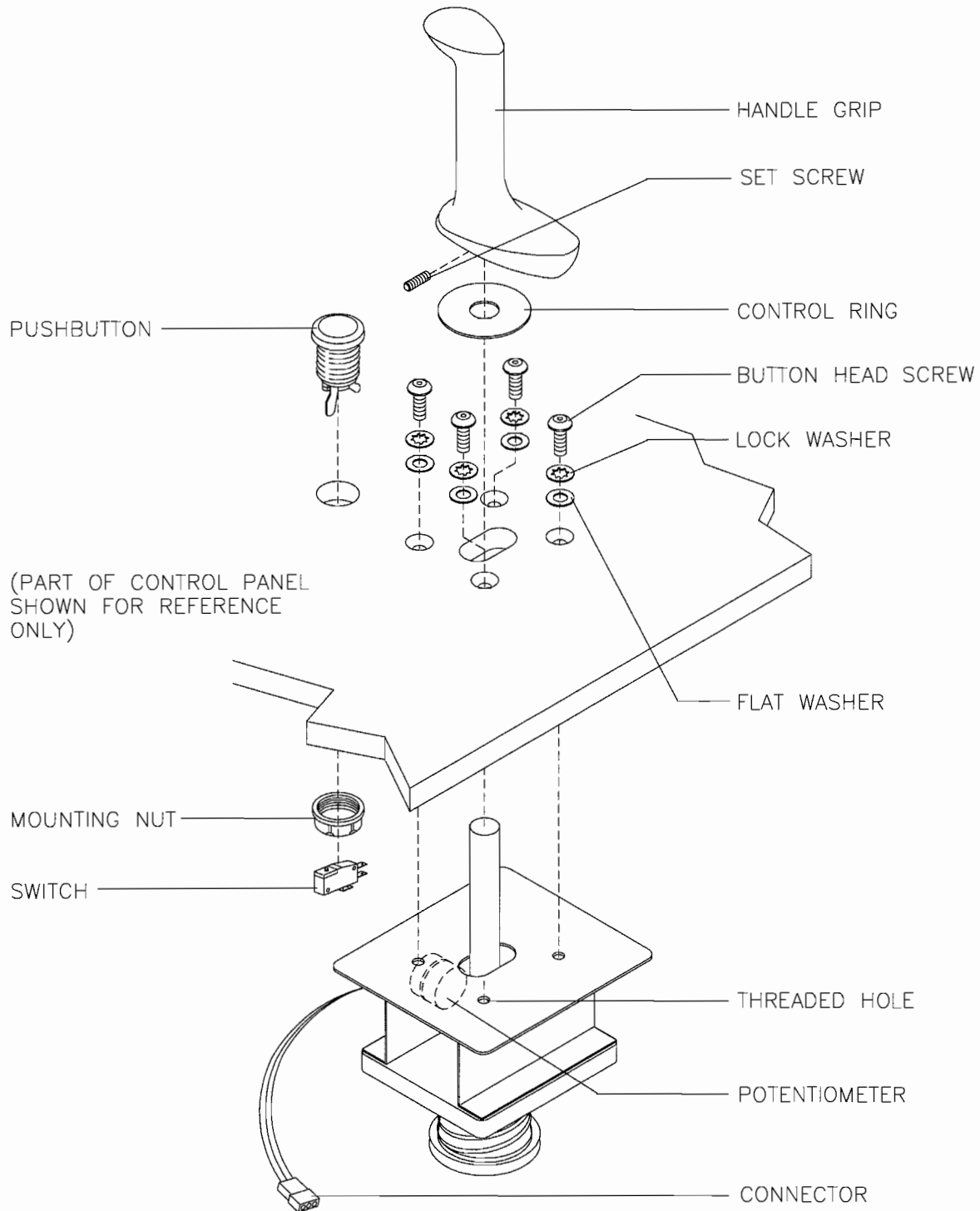
1. Remove the control panel buttons and joysticks from the existing control panel. Remove the panel covering and any artwork from the previous game. Remove any hinges or mounting brackets.
2. Fill the existing control panel holes with wood, putty, glue or other suitable material. Allow adequate time for materials to dry, then sand or file the control panel to a flat surface on both sides.
3. Orient the template with the START pushbutton toward the top. Center the template on the control panel. Mark joystick and pushbutton hole locations. Cut and deburr the holes. Remove the template.

NOTE: The joystick mounting holes must be counterbored to recess the heads of the screws.

4. Place the control panel face down on top of the clear plastic cover and center it. Mark the outside shape of the panel, the pushbutton location, and the joystick hole location onto the cover. Remove the control panel and set it aside. Cut and deburr the holes for the control panel button and joystick. *Do not cut any joystick mounting holes in the cover.* Trim the cover to panel shape and set it aside.
5. Remove the backing and apply the decal to the control panel. Start at the top and work down. After the decal is in place, smooth it outwards, carefully squeezing out air bubbles. If you can not remove an air bubble, pop it with a sharp knife or pin and smooth it down. Allow the decal adhesive to set.
6. Use a sharp knife to trim the edges and to cut the holes for the pushbutton and the joystick handle grip. Position the control decals next to the appropriate hole locations. Allow the adhesives to set.



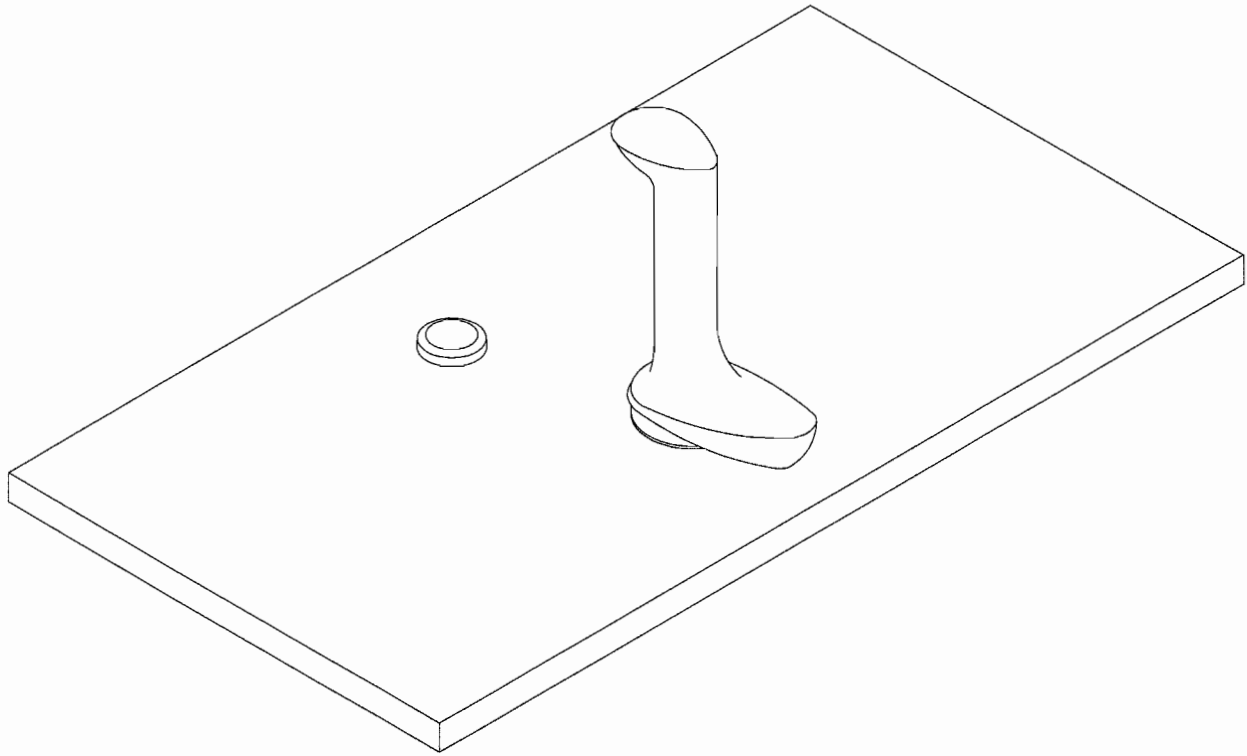
CONTROL LOCATIONS



CONTROL MOUNTING

7. The pushbutton switch must be disassembled for panel mounting. Separate the switch from its push-button. Bend the large prong away from the switch just enough to slide the switch off of the housing. Unscrew the nut from the housing. Insert the push-button housing through the switch hole from the front side of the control panel. Screw the nut finger tight onto the switch housing from the back of the panel. Snap the switch back onto the housing.
8. Rotate the pushbutton so that the switch terminals are properly oriented and tighten the nut firmly.

9. Remove the joystick handle grip using the T-25 tamper resistant wrench. Orient the joystick with the potentiometer facing toward the switch. Center the joystick mounting plate under the hole. Attach the mounting plate under the control panel with flat washers, lockwashers, and metric machine screws.
10. Move the joystick shaft to its extreme left position. Move the joystick shaft to its extreme right position. Ensure that the shaft does not hit the control panel. Enlarge the hole as required to prevent binding. **Insufficient shaft motion will cause improper control calibration and may prevent game play.**
11. Place the plastic control ring over the top of the joystick shaft. Install the joystick handle grip on the joystick shaft and press it down to seat it fully. Orient as illustrated and tighten the handle set screw.
12. The completed control panel should now resemble the illustration below. Install the modified control panel onto the modified cabinet using the existing mounting hardware. Tighten all fasteners firmly.



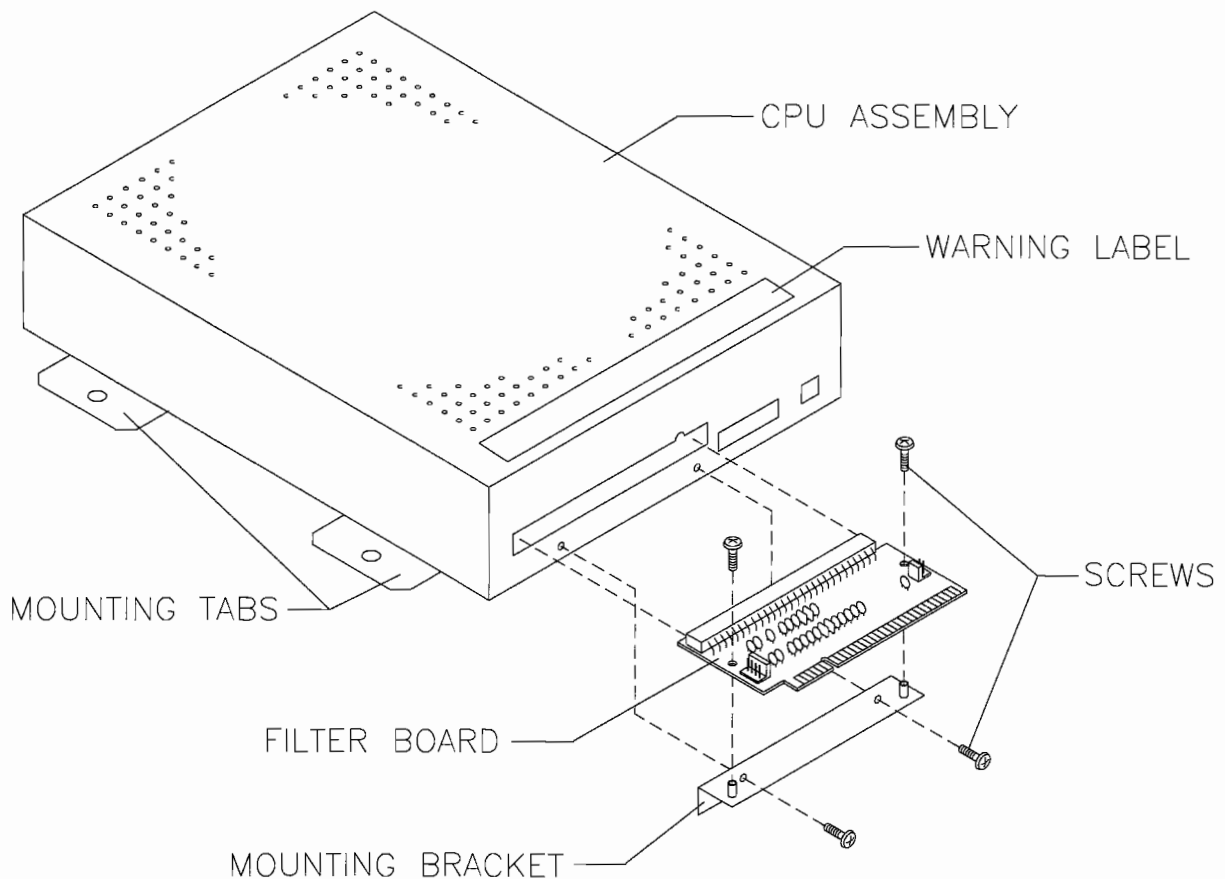
TYPICAL COMPLETED CONTROL PANEL

GAME ELECTRONICS COMPONENTS

The CPU Board Assembly electronic components are static sensitive. Prepare an anti-static work area and ground yourself before removing the CPU Board from its protective shipping materials.

Do not connect any cable to the CPU Board Assembly or Power Supply with the power turned on. Doing so while the power is turned on may damage the game and void your warranty.

1. Be certain that the power is switched off and the cord is disconnected from the A.C. line voltage. Carefully disconnect each printed circuit board in the game. Remove the existing circuit board set and the disk drive (if present) and set aside. Save the mounting screws. Anti-static bags and protective containers from the new components may be used to store these items after conversion is complete.
2. Remove the CPU/PCB Assembly from its packaging and place it on a flat, static-free work surface. Orient it with the connector panel facing toward you as illustrated below. Remove the two screws under the PCB CONNECTOR opening and retain them to attach the Filter Board Assembly bracket.
3. Locate the Filter Board Assembly and remove it from its packaging. Orient it with the edge connector next to the PCB CONNECTOR and the bracket underneath as illustrated below.
4. Mate the keyed connectors and press firmly to seat the contacts. *Do not use excessive force.*
5. Align holes and install the screws. Tighten screws snugly. The game wiring attaches to this board. Handle the completed electronics assembly carefully to avoid damage to the protruding Filter Board.



ASSEMBLY OF GAME ELECTRONICS COMPONENTS

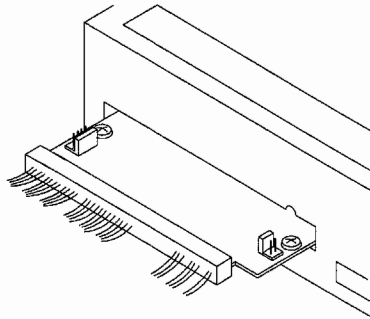
CABINET WIRING

NOTE: The operator must install a JAMMA wiring harness, or use the JAMMA cable from the existing game. Inspect existing cabinet wiring and compare with the Recommended Cabinet Wiring Diagram (Section Three). Most games already have JAMMA wiring which is compatible with the conversion kit. If the connectors in your cabinet do not fit onto the Filter Board or the wire colors do not match the JAMMA Chart, contact your authorized distributor for assistance with this problem.

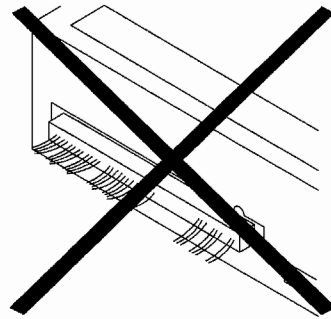


CAUTION

Properly insulate any unused wires within the JAMMA cable, especially red, yellow, orange and black power wires. Secure any unused connectors away from the CPU Board.



CORRECT JAMMA CONNECTION



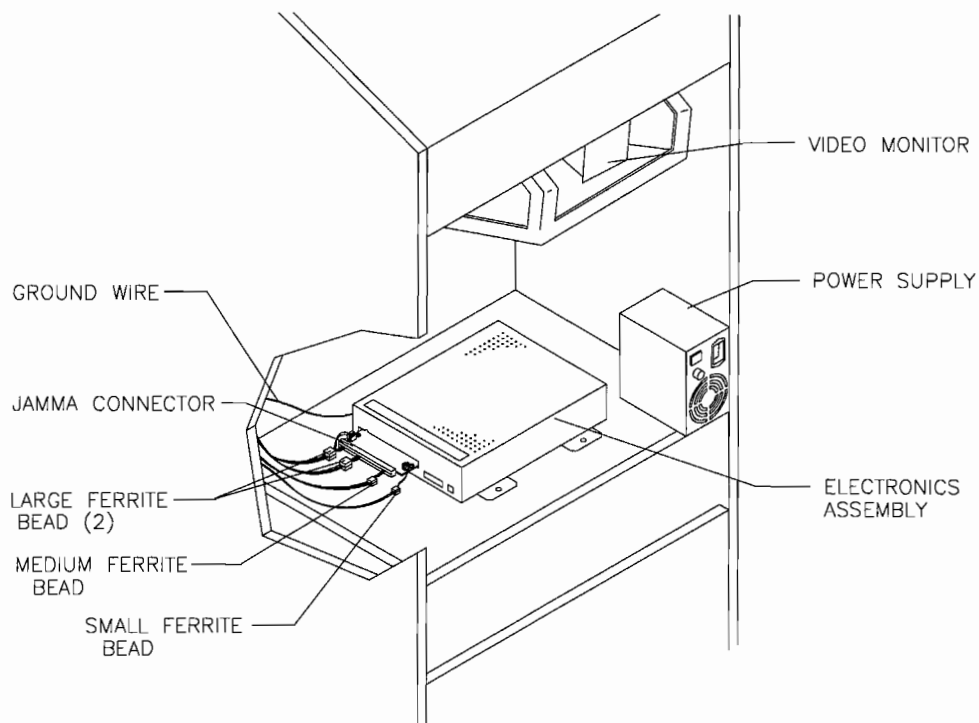
WRONG! FILTER BOARD MISSING!

Do not connect the JAMMA wiring harness directly to the PCB Connector on the end panel of the electronics assembly. All JAMMA wiring must connect to the Filter Board Assembly only. Failure to install the Filter Board Assembly onto the CPU Board will damage internal circuits.

1. Locate the START 1 wires from the JAMMA cable at the control panel (refer to the JAMMA Chart and the Cabinet Wiring Diagram in Section Three). Connect these wires to the control panel pushbutton. The switch must be Normally Open. Insulate and secure any unused wires away from the joystick and switch terminals. Verify wiring continuity between the START switch and the JAMMA connector.
2. Locate the joystick wiring harness cable H-22319. Route this cable *along* the existing JAMMA wiring in the cabinet to the control panel. Attach the proper end of the harness to the joystick cable.
3. Cabinets without complex speaker systems may be wired directly to the JAMMA Connector harness. Connect these wires to the speaker terminals. Verify continuity between speakers and connector.
4. If a subwoofer is used, locate the existing cabinet cable or make your own wiring harness (not included with the kit). Route this cable *away from* the existing wiring in the cabinet to the woofer location. Attach the wires to the speaker (observe correct speaker terminal polarity). Secure the wiring using appropriate clamps and screws. Again, verify wiring continuity to the woofer.
5. If your cabinet does not have service switches (not included with the kit), you may wish to add them at this time (this speeds up routine service calls). Most new game electronics can accommodate signals for service credits, test modes, and volume changes. Wire colors, connector pin assignments, and sample wiring diagrams for these momentary switches are found in Section Three of this manual.
6. Connect any ground wires loosened or removed in previous steps (control panel, coin door, etc.). Install a ground wire onto the most convenient ground tab of the game electronics assembly.

FINAL ASSEMBLY

1. Place the completed Electronics Assembly in the cabinet where the previous electronics were located. Locate the JAMMA edge connector on the Filter Board. Orient the assembly so that the JAMMA contact area on the Filter Board is next to the JAMMA connector on the harness. Ensure that there will be adequate space nearby for the cooling fan if there is one already in the cabinet. Use the assembly itself as a template to mark mounting hole locations.
2. Locate the #8 hex head wood screws supplied with the kit. If necessary, drill pilot holes for screws. Install a screw in every mounting hole and secure the Electronics Assembly to the cabinet. Tighten screws firmly. *Do not install the JAMMA connector at this time.*
3. Electrical codes require conductive assemblies to be grounded for safe product operation. Locate the central power ground point for the cabinet (ground wires are usually green; some may have a yellow stripe). Connect a short, heavy gauge ground wire from the assembly to the central power ground.
4. Locate the square split ferrite beads. Separate the wires in the main harness into two bundles where they attach to the JAMMA connector. Install one large ferrite bead around the D.C. power conductors (solid color heavy gauge wires with pin numbers 1-6 or A-F). Install the other large bead around the control panel conductors (striped color lighter gauge wires) and the joystick harness cable wires. Install the medium size bead around the wires to the video monitor. Install the small ferrite bead around the subwoofer harness cable wires. Place the beads as close to the JAMMA connector as possible, then close and lock each one. Ensure that no wires are pinched or caught in the latches.
5. Attach the wiring harness JAMMA Connector to the Filter Board Assembly. Attach the four-pin joystick connector and the two-pin woofer connectors to the Filter Board. Mate the connectors and press firmly to seat the contacts fully. *The connectors are keyed. Do not use excessive force.*
6. Place the FBI Warning Label next to the Electronics unit. Be certain the label is completely visible.



TYPICAL GAME ELECTRONICS BOARD ORIENTATION

INITIAL POWER UP

1. Plug the line cord into a source of A.C. power and turn it on. CPU Board indicators (visible through the holes in the top of the electronics assembly) should illuminate.
2. The game will load the program and begin self diagnostics. If no errors are found, the game will automatically enter its "ATTRACT" mode. Sounds and scenes from the game will alternate on the screen. Check wiring and refer to Troubleshooting (Section Four) if problems occur.
3. Unlock and open the coin door. Press and hold the TEST button until the TEST MODE menu system appears on the screen. Select CONTROLS and verify that each switch and control operates properly. Refer to Operation (Section Two) for test steps.
4. Return to the TEST MODE menu screen. Choose SCREEN ADJUST to check monitor color levels, brightness, contrast, and other variables (refer to Operation for details).
5. From the TEST MODE menu, select SETTINGS to adjust the game difficulty, sound options, linking mode, and coin options (refer to the Operation for details).
6. Return to the TEST MODE menu and select SOUND TEST. Check the proper function of each sound channel (refer to Operation for details). Channel 1 is Left, Channel 2 is Right, Channel 3 is Woofer.
7. From the TEST MODE menu, select EXIT to begin normal game operation. *Leaving the TEST MODE menu system without choosing "EXIT" cancels any changes made in any of the TEST MODE menus.*
8. Open the coin door and press the SERVICE CREDITS button to allow game play. Press the START button to begin. Listen to the audio while playing the game. Note unexpected irregularities in sound (out of phase, no low frequencies, mono signals from the speakers, etc.). Check the wiring harness for internal shorts, strapped connections, missing wires, etc.
9. Close and lock the coin door. Replace the rear cabinet door. Allow the system to operate for several hours before attempting any game changes. Refer to Operation (Section Two) for adjustment steps.
10. When proper operation is confirmed, the game may be tested for FCC or other agency approval.

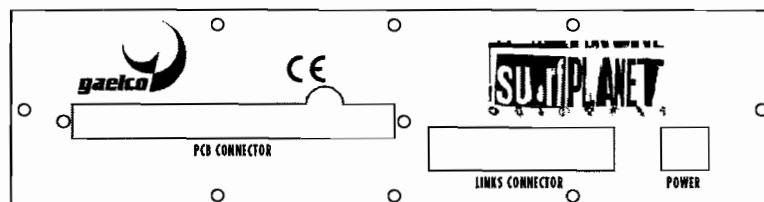
YOU ARE SOLELY RESPONSIBLE, AND ATARI WILL HAVE NO RESPONSIBILITY FOR FCC COMPLIANCE FOR INSTALLATIONS IN PRODUCTS OTHER THAN A 25" ATARI UNIVERSAL FAMILY VIDEO CABINET). THE FCC COMPLIANCE STICKER SUPPLIED MUST NOT BE INSTALLED ON THE CONVERTED PRODUCT UNTIL FCC COMPLIANCE IS VERIFIED.

LINKING

Two games may be connected together to permit player competition. You must purchase a special linking cable, ATARI Part No. 20-10435, not included with this kit (contact your distributor for availability).

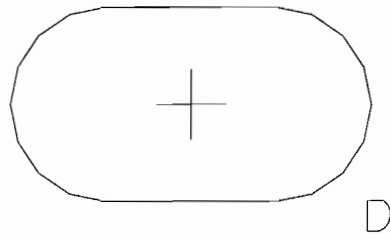
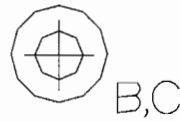
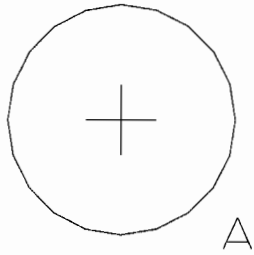
INTERCONNECTING GAMES

1. Verify the operation of the existing games before making any changes. Unlock the coin doors of both cabinets and press the TEST MODE switches. Select SCREEN ADJUST. The VERSION information must be the same. *Linked games must all have compatible software versions. Newer versions may contain features that previous versions do not have, causing games to halt or reset at random.*
2. Turn OFF the power for both cabinets. Unlock and remove the cabinet rear doors. If there is no slot or notch under the door opening for the linking cable to pass through, cut or file one in each cabinet.
3. The linking cable connectors are keyed to fit one way. Orient the linking cable end plug over the right side LINKS CONNECTOR socket (nearest the POWER connector) on the Electronics Assembly. Mate the connectors and press firmly to seat fully. *Do not use excessive force.*
4. Route the cable through the cabinet interior and out of the slot or notch. Route the free end of the cable through the slot or notch in the second cabinet and attach it to the electronics as above.
5. Turn ON the power for both cabinets. The games will start up and begin the Power On tests. If no serious errors are detected, the games will enter the "attract" mode automatically (there may be a few minor errors reported on the screens). Refer to Troubleshooting in Section Four for assistance.
6. Press the TEST MODE switches to enter the menu systems. Select SETTINGS, then choose MACHINE NUM. on both menus. Set the left cabinet to be 1UP and the right cabinet to be 2UP. Change LINK MODE for both cabinets to be ON. Modify COIN or CREDIT values as desired, then select BACK TO MENU on both machines. *Do not turn off the power or your changes will be lost.*
7. Choose EXIT on either one of the cabinet menus. Both machines will reset. The games will start up and begin the Power On tests. If no serious errors are detected, the games will enter the "attract" mode automatically and synchronize quickly. Turn Off power to the games, wait a few minutes, then turn the power On to clear errors (refer to Troubleshooting in Section Four if errors remain on screen).
8. Retract any excess cable back into the cabinets so that the cables do not touch the floor. This keeps the cables away from the casters during relocation and protects it somewhat from player's feet.
9. Reinstall the rear doors onto the cabinets. Lock the rear doors and remove the key. Install screws at the top and sides of the rear doors and tighten snugly. Close and lock the cash box and coin doors.
10. If the cabinets need to be separated for service or relocation, enter the menu systems and return the settings to LINK MODE OFF and 1UP for both game cabinets. Go BACK TO MENU and EXIT on both cabinets before you disconnect the cable. *Do not turn off the power or your changes will be lost.*



LOCATION OF CONNECTOR FOR LINKING CABLE

CONTROL PANEL TEMPLATE
SURF PLANET 16-10476



HOLE LEGEND		
SIZE	KEY	QTY
1.19 IN (3.0 CM) THROUGH	A	1
.25 IN (.63 CM) THROUGH	B	4
.50 IN (1.27 CM) C'BORE .2 IN (.5 CM)	C	4
1.0X1.9 IN (2.5X4.8 CM) THROUGH	D	1

SURF PLANET™ KIT

SECTION TWO

OPERATION

NOTICE

Information in this manual is subject to change without notice. ATARI reserves the right to make improvements in equipment function, design, or components as progress in engineering or manufacturing methods may warrant.

Fill out and mail in the Game Registration card. Be sure to include the game serial number from the label on the rear of the cabinet. For your records, write the game serial number in the manual. SERIAL NUMBER _____

GAME OPERATION

STARTING UP

Each time the game is first turned on or power is restored, it begins executing code out of the boot ROM. These self-diagnostic tests automatically verify and report the condition of the hardware. The screen displays information about the software version and condition of the hardware. If any of the individual tests fails, then an error message will be displayed for each test.

- * If no buttons are pressed, the system will quickly complete all tests then load and run the game.
- * Press and hold the coin door TEST button to activate the TEST MODE menu system.

Once all Power-up tests have been passed, the game goes into its "attract mode." Scenes and sounds from a typical game are alternated with previous high scores in an endless pattern until game play starts.

Insert currency to start the game. Play begins after a circuit is chosen. The game will progress until time is exhausted. If no more play is required, the game automatically returns to the "attract mode."

GAME RULES

Snowboarding, the sport in which participants use a special ski-like surf board to glide over snow, is the source of inspiration for this video game. A number of players, or "surfers", compete with each other in descending various mountain circuits. The game offers players four separate circuits of differing difficulty: EASY, MEDIUM, EXPERT and LAST STAGE. Players must successfully complete the first three stages in any sequence before they can test the supreme challenge of the LAST STAGE circuit.

The objective of the game is to complete all the circuits. Players must strive to get the best possible classification in each level of difficulty while in competition with virtual or real (linked) players. The time needed to complete a stage, the distances jumped, and the player's overall rank are constantly displayed.

INDIVIDUAL PLAY

Insert currency or tokens to start the game. Press the START button. At the CHOOSE A RIDE message, move the joystick to the desired circuit and select it with the START button. Each circuit has a particular difficulty level: EASY, MEDIUM, EXPERT, or LAST STAGE. The LAST STAGE run can only be chosen after a player has successfully completed each of the easier runs in any order. At the message CHOOSE A SURFER, select a character with the joystick and press the START button to begin game play.

The competition begins automatically as surfers jump from a helicopter onto the circuit. During the race, players must pass several CHECKPOINTS and collect quantities of WAX to successfully complete the ski run. The more WAX collected during the downhill run, the faster the player descends the slope.

MULTIPLE PLAYERS

Head-to-head competition is possible between two players only on linked cabinets. The game begins as in individual play with the selection of a circuit and a surfer. When both players have completed their selections, the helicopter drops the surfers and competition begins. An indicator bar at the top of the screen shows which player is scoring more points during competition.

STATISTICS

A display in the corner of the screen shows each player's speed (in mph or km/h) and relative position (POS --/--) during play. The records for the fastest time (R: ----) and current elapsed time (T:----) for the selected circuit also appear. After a jump, the game briefly displays the length of the jump (in meters) and the record jump. Record-breaking times or jump lengths may be posted for world-wide recognition on the Internet. Check the Surf Planet Website at <http://www.surfplanet.com>.

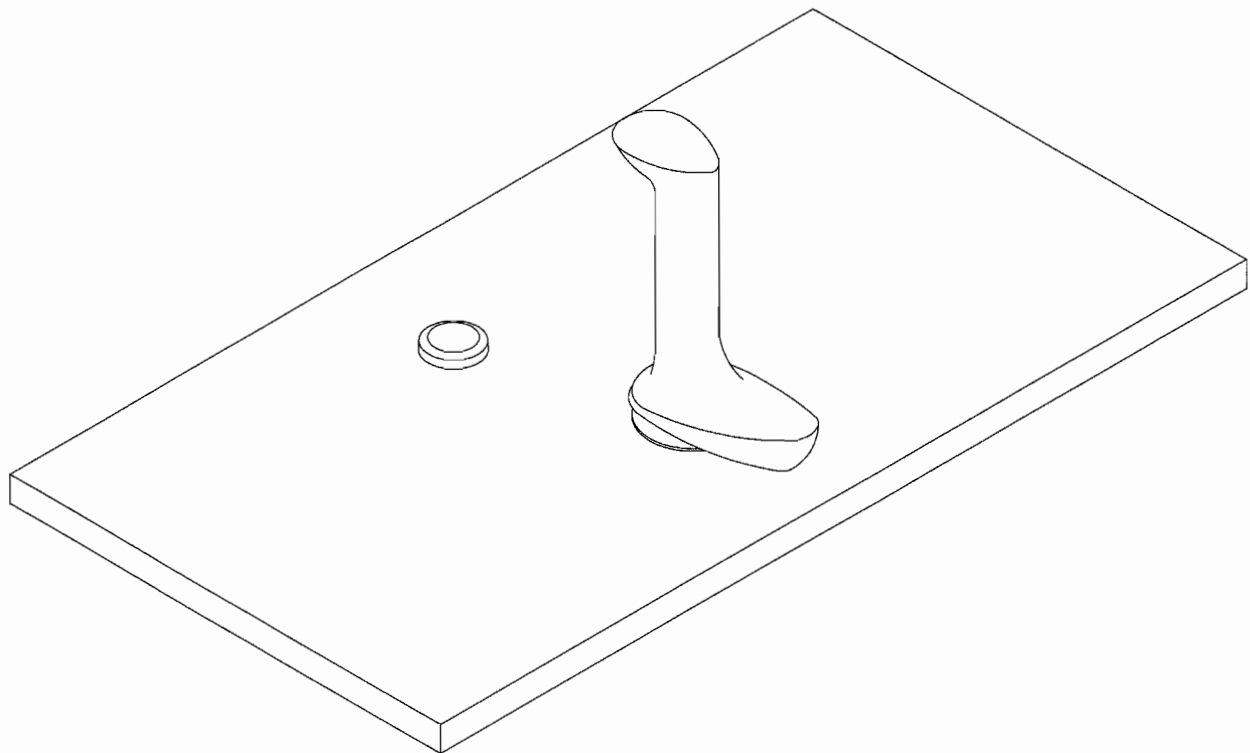
PLAYER CONTROLS

- ◆ **START Button**

This button allows players to begin or continue play. It also selects each player's circuit and surfer. This same button selects items from the TEST MODE menus during service or adjustment.

- ◆ **JOYSTICK**

The joystick is used to guide the surfer's board down the slope and to avoid fixed or moving objects. The joystick moves the cursor to different selections in the TEST MODE menus during service.



TYPICAL PLAYER CONTROL LOCATIONS

OPERATOR CONTROLS

CABINET SWITCHES

- ◆ **Power Switch** (usually on the top or back panel of the cabinet)
The **Power Switch** turns off the game during service. It does not reset the game variables.
- ◆ **Monitor Remote Adjustments** (typically behind the coin door or in the cabinet near the monitor)
The **Monitor Remote Adjustment Board** sets the video display for optimum viewing.
- ◆ **Slam Tilt Switch** (on coin door) prevents cabinet abuses such as pounding to obtain free games.

CONTROL SWITCHES

- ◆ **Volume Down and Volume Up Buttons** (frequently mounted on or behind coin door in many games)
The **Volume Down** and **Volume Up** push-button switches increase or decrease game sound levels. Press either button briefly to make minor changes. Press and hold a button to make major changes.

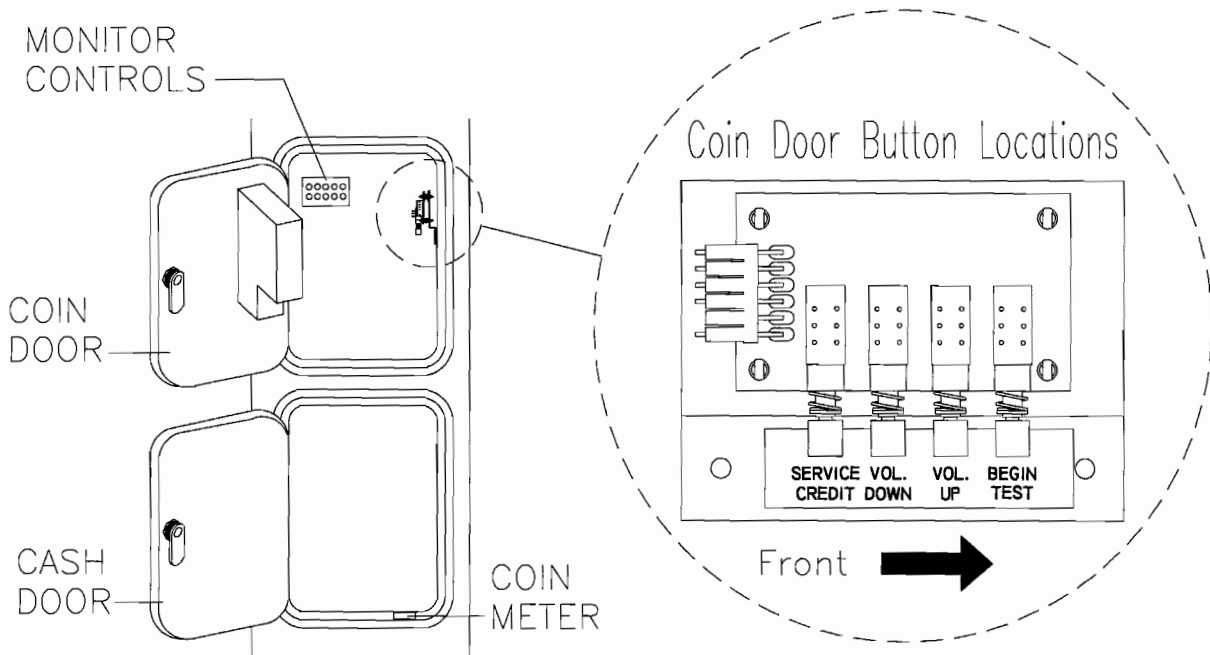
NOTE

The Attract Mode volume is controlled independently of the Game Mode volume.

- ◆ **Test Mode Button** (mounted on or behind the coin door on games equipped with this switch)
The **Test Mode** push-button switch enters the menu system. Press the Test Mode button briefly to run automatic tests. To save changes, use the EXIT selection on the TEST MODE main menu.
- ◆ **Service Credit Buttons** (mounted on or behind the coin door on games equipped with this switch)
The **Service Credit** push-button switch allots credits without changing the game's bookkeeping total.

These buttons may also be used instead of the player controls when operating the menu system.

NOTE: The coin door must be open to reach the control switches in most games.



TYPICAL CONTROL SWITCH LOCATIONS

TEST MODE MENU SYSTEM

SYSTEM OVERVIEW

Game variables and diagnostics are presented in a series of on-screen TEST MODE menus. The TEST MODE Main Menu screen allows the operator to select one of several testing or statistical features and to save changes made in the sub-menus. Each sub-menu screen displays one specific group of choices in a detail menu. The detail menu presents data, settings, or runs a test. You must be at the detail menu level to detect errors, make changes, or activate tests. Both the operator controls and the player controls are used to move through the menus and start or stop particular routines.

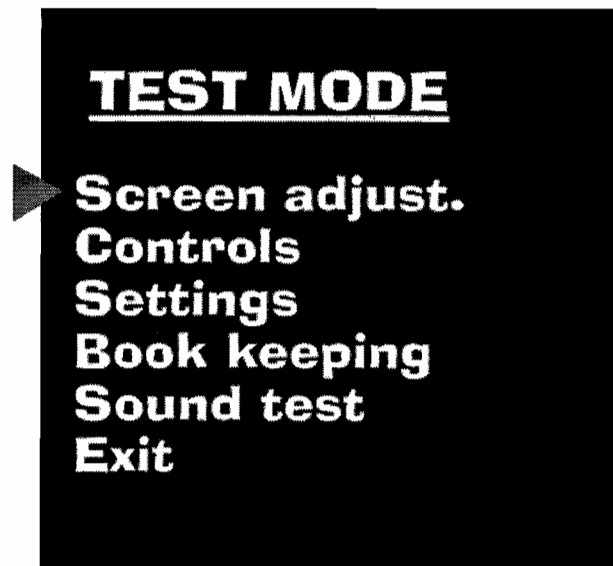
ORGANIZATION

TEST MODE main menu screen items fall into three categories: options, statistics, and tests. Items must be activated manually by pressing the START button after moving the cursor to them with the joystick.

Sub-menu screen items offer the operator choices within a category. Some items have no sub-menu while others may have more than one. Sub-menus always have an option to return to the previous menu.

Detail-menu screen items contain specific information. The operator must select an item to run tests or to make changes. There is always a way to go back to the previous menus from the detail menu screen.

Use the joystick to highlight an item on any menu. *Only one highlighted item can be selected at a time.* To return the game to normal, select EXIT from the TEST MODE main menu, then press the indicated button. This also saves any changes made in the sub-menus.



TEST MODE MAIN MENU SCREEN

SCREEN ADJUSTMENTS

The SCREEN ADJUSTMENTS display provides patterns for verifying the monitor performance or making adjustments. There are also basic tests of the critical CPU Board components.

Use the joystick to select SCREEN ADJUST from the TEST MODE main menu items, then press START. This test displays the same screen as during the start-up self-test, and includes patterns for adjusting monitor controls. Convergence patterns appear at each corner. Color bars for hue and brightness adjustments display across the center of the screen. Patterns and bars should be sharp and distinct.

The monitor controls to adjust these features may be at the rear of the coin door cavity, attached to the wall of the cabinet, mounted or near the neck of the CRT.

The MACHINE NUMBER, used in linking of two cabinets for head-to head competition, is shown below the color bars graphic. The software version and hardware testing status also are displayed on the screen. After making any changes or adjustments to the video monitor, select BACK TO MENU and press the START button to return to the TEST MODE menu screen.

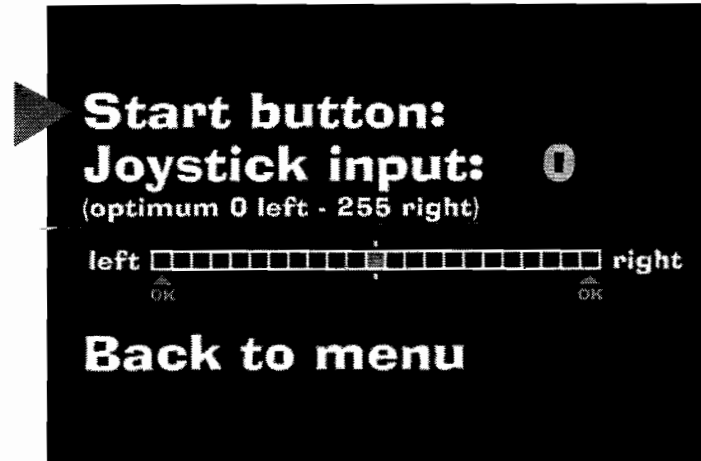
NOTE: The Machine number can not be changed from this menu. It is a display only game screen. (Refer to SETTINGS later in this section of the manual for instructions to modify the Machine number).



SCREEN ADJUSTMENTS DISPLAY AND MENU

CONTROLS

The CONTROLS test checks the operation of the START button and joystick.



CONTROLS TEST MENU SCREEN

To check the function of the START button, use the following steps:

1. Move the joystick to put the cursor on the option "Start button" and press the START button to begin. If it is functioning properly, "OK" should appear on the screen only as long as the button is depressed.
2. Release the START button. The "OK" indication must not be present with no pressure on the button.

To check the operation of the JOYSTICK, use these steps:

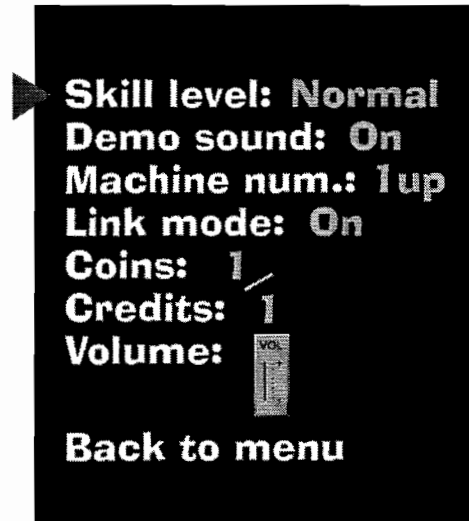
1. Move the joystick to put the cursor on the option "Joystick input" and press the START button to begin.
1. Move the joystick to its left-hand limit and hold it there. The red cursor should be above the left "OK". If the joystick is operating correctly, the indicator changes to **green** and an audible signal is activated. The Joystick input value should be a numerical value between **0** and **35**.
2. Move the joystick to its the right-hand limit and hold it there. The red cursor should be above the right "OK". If the joystick is operating correctly, the indicator changes to **green** and an audible signal is activated. The Joystick input value should be between **220** and **255**.
3. Release the joystick so that it is exactly centered in a position perpendicular to the control panel. The red cursor should be in the center of the indicator strip and the Joystick input value should be between **120** and **135**. When the Joystick input reaches this value, an audible signal sounds repeatedly.

If any of these operations cannot be completed successfully, try repeating the entire sequence again. Refer to TROUBLESHOOTING in Section 4 for information on how to calibrate or service the joystick.

After these steps have been completed, push the joystick to the left or right limit briefly and release it to select the BACK TO MENU option and return to the TEST MODE menu screen.

SETTINGS

The SETTINGS detail menu screen allows changes to game parameters. Use the joystick to select each option, and START button to see available choices. Return to TEST MODE and EXIT to save changes.



SETTINGS MENU SCREEN

SKILL LEVEL selects the degree of game difficulty. Press the START button to set SKILL LEVEL to "Easy," "Normal," "Hard," or "Very Hard." "Normal" is the factory default setting.

DEMO SOUND sets what type of music the machine will play music in "attract" mode. "On" plays music from one of the stages continuously. "Off" turns the sound off between games. "Every 4" plays music every fourth time the "attract" mode cycles. Select a DEMO SOUND by pressing the START button.

MACHINE NUMBER assigns a value for linked operation. For individual play, this setting must be "1 up". Each machine must have a unique number for head-to-head competition. Set the machine number to "1 up" or "2 up" as appropriate with the START button. Do not use "2 up" unless two machines are linked.

LINK MODE sets the game for individual or head-to-head competition. "Off" sets the game for individual play (factory default). "On" allows competition (the game must be linked by cable to another cabinet).

NOTE: If a machine is inadvertently set to "2 up," or if LINK MODE is set to "On" when it is not connected to another machine, turn off the machine. Disconnect the linking cable. Wait a few minutes, then turn the machine on again. Go to SETTINGS in the TEST MODE menu screen. Change the LINK MODE to "Off". Set the MACHINE NUMBER to "1 up." Return to the TEST MODE main menu and select EXIT to save the changes. Use this same procedure to break a connection between machines for relocation or repair.

COINS sets the number of coins required to obtain one game credit. **CREDITS** sets the number of game credits needed to begin a game. COINS and CREDITS can be set independently from one to nine. Change the setting by pressing the START button repeatedly until the screen displays the proper value. Setting COINS to zero allows free play. 1 COIN and 1CREDIT are the default values.

VOLUME sets the sound volume during play. Select VOLUME with the joystick, then set the level by pressing the START button while the background music plays. The level will always increase with each press to a maximum level, then begin again from minimum. Press START several times until the volume is at the desired level. VOLUME UP and VOLUME DOWN buttons may also be used when present.

BOOK KEEPING

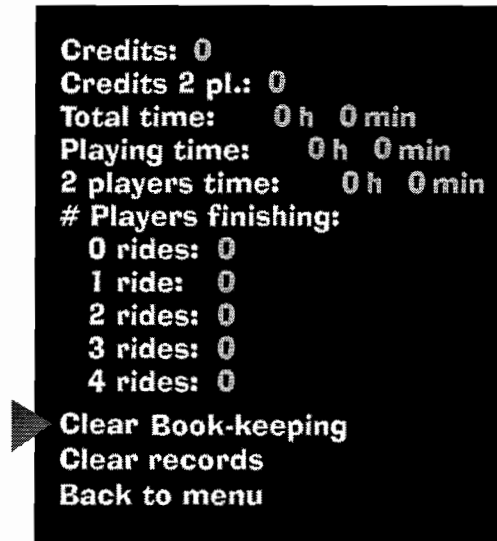
The BOOK KEEPING report allows the operator to assess how well the game is being played. In addition to earnings, various game aspects are tracked to determine player skill levels.

Use the joystick to select a menu item. Press START after selecting CLEAR BOOK-KEEPING or CLEAR RECORDS to delete saved data in either of these registers. Failure to press START will restore old data.

CLEAR BOOK-KEEPING deletes the coin data CREDITS from the machine register.

CLEAR RECORDS deletes the player time and skill statistics from the machine register.

NOTE: Once the BOOK-KEEPING or RECORDS registers have been deleted, the data is gone forever. Record these statistics with pencil and paper to save them before relocating or servicing the machine.



STATISTICS REPORT MENU SCREEN

The illustration shows how the report screen will look when the machine is first turned on or after the data has been deleted. Most of the statistics will increase in value as the game is played. It is normal for some values to remain at zero: for example, the "2 players time" count will not change unless an additional cabinet has been connected to the machine and players have been competing in linked games.

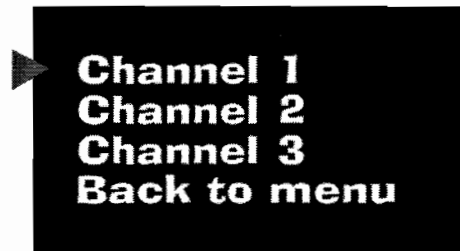
Low or high counts in both coin and player statistics may indicate that the game difficulty is not optimum for the skill levels of players at this location. The difficulty level may be adjusted from the SKILL LEVEL option of the SETTINGS menu. Return to the TEST MODE menu screen and EXIT to save changes.

SOUND TEST

These tests check that the speakers are wired correctly. Select each channel with the joystick one at a time and press START. The sound should be heard from only one speaker when each channel is tested.

CHANNEL 1 corresponds to the left speaker.
CHANNEL 2 corresponds to the right speaker.
CHANNEL 3 tests the subwoofer speaker.

NOTE: *The volume level may be too low for noisy locations. Check the volume setting before testing.*



SOUND TEST MENU SCREEN

The SOUND TEST is used to verify broken or crossed connections.

If the speakers are connected correctly, the game clearly plays the word "perfect" from the selected speaker with each single press of the START button. No sound should be heard from the other speakers. Each voice should come from the location identified. The word "perfect" should be clear and distinct.

Because this test generates only one signal at a time, it cannot be used to detect distortion or incorrect phase. After all three channels are verified, return to the TEST MODE menu and EXIT to the game. Play the game and listen to all speakers working together to determine if these characteristics are correct.

SURF PLANET KIT

SECTION THREE

WIRING

Warning

Failure to reconnect all ground wires or replace metal shields and covers with each mounting screw installed and securely tightened may result in radio frequency interference.

Do not connect the wiring harness directly to the PCB Connector. Failure to install the Filter Board Assembly onto the CPU Board Assembly will damage the game electronics and void the warranty.

JAMMA Chart

FUNCTION	WIRE COLOR	PIN	PIN	WIRE COLOR	FUNCTION
Ground	Black	A	1	Black	Ground
Ground	Black	B	2	Black	Ground
+5VDC	Red	C	3	Red	+5VDC
+5VDC	Red	D	4	Red	+5VDC
-5VDC	Yellow	E	5	Yellow	-5VDC
+12VDC	Orange	F	6	Orange	+12VDC
Key	N/C	H	7	N/C	Key
Not Used	N/C	J	8	Red-Green	Coin Counter 1
Not Used	N/C	K	9	N/C	Not Used
Speaker -, Left	Yellow-Green	L	10	Yellow-Red	Speaker +, Left
Speaker +, Right	White- Green	M	11	White-Red	Speaker -, Right
Video Green	Green	N	12	Red	Video Red
Video Sync	White	P	13	Blue	Video Blue
Service Credits	Orange-Black	R	14	Black	Video Ground
Not Used	N/C	S	15	Blue	Test
Coin 2	Green-Blue	T	16	Red-Blue	Coin 1
Not Used	N/C	U	17	Red-White	1 Start
Not Used	N/C	V	18	Green-White	Sound +
Not Used	N/C	W	19	Blue-White	Sound -
Not Used	N/C	X	20	N/C	Not Used
Not Used	N/C	Y	21	N/C	Not Used
Not Used	N/C	Z	22	N/C	Not Used
Not Used	N/C	a	23	N/C	Not Used
Not Used	N/C	b	24	N/C	Not Used
Not Used	N/C	c	25	N/C	Not Used
Not Used	N/C	d	26	N/C	Not Used
Ground	Black	e	27	Black	Ground
Ground	Black	f	28	Black	Ground
SOLDER SIDE			COMPONENT SIDE		

Control wires that are not part of the Main JAMMA Harness: Joystick

+5VDC	Red	1	1	Red	+5VDC
Key	NC	2	--	NC	Not Used
Joystick Position	White	3	2	White	Joystick Position
Ground	Black	4	3	Black	Ground

Control wires that are not part of the Main JAMMA Harness: Optional Subwoofer*

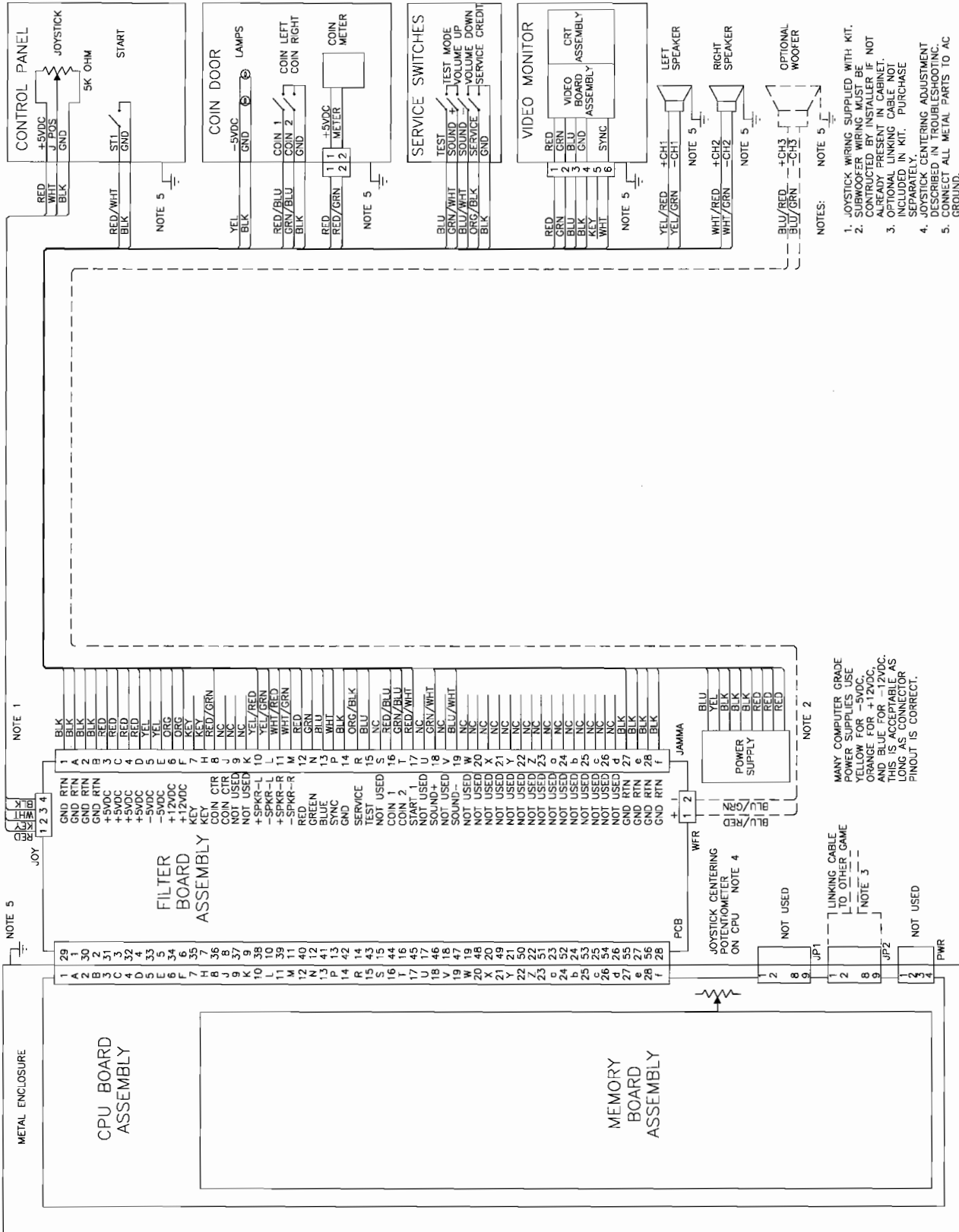
+ WFR	Blue-Red	1	+	Blue-Red	+ Woofer
- WFR	Blue-Green	2	-	Blue-Green	- Woofer

D.C. Power Source Voltage Limits

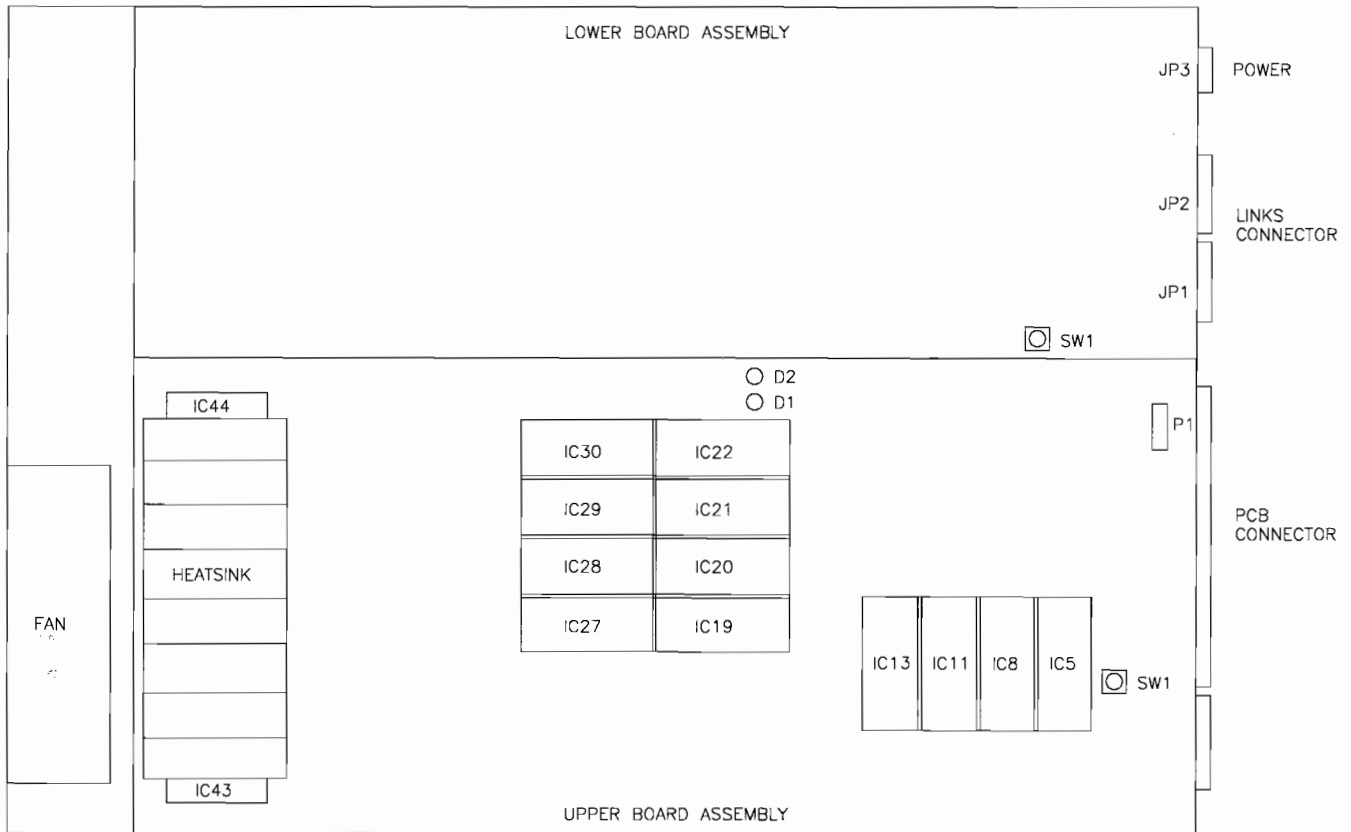
FUNCTION	RANGE LIMITS	COLOR	FUNCTION	RANGE LIMITS	COLOR
Digital Circuits	+4.90V to +5.10V	Red	Coin Lights	-4.75V to -5.25V	Yellow
Audio, Lights	+11.5V to +13.5V	Orange	Auxiliary Power	-11.5V to -13.5V	Blue

*NOTE: Joystick wiring supplied with the kit. Subwoofer wiring must be constructed by installer.

RECOMMENDED CABINET WIRING DIAGRAM



20-10432 CPU BOARD ASSEMBLY



INDICATOR, SWITCH AND REPLACEABLE COMPONENT LOCATIONS

Field Replaceable Parts

DESIGNATION	PART NUMBER	FUNCTION	DESCRIPTION
IC5	A-5343-34035-1	Game Program PLS5	EPROM Assembly
IC8	A-5343-34035-2	Game Program PLS8	EPROM Assembly
IC11	A-5343-34035-3	Game Program PLS11	EPROM Assembly
IC13	A-5343-34035-4	Game Program PLS13	EPROM Assembly
IC19	A-5343-34035-5	Game Program PLS19	EPROM Assembly
IC20	A-5343-34035-6	Game Program PLS20	EPROM Assembly
IC21	A-5343-34035-7	Game Program PLS21	EPROM Assembly
IC22	A-5343-34035-8	Game Program PLS22	EPROM Assembly
IC27	A-5343-34035-5	Game Program PLS19	EPROM Assembly
IC28	A-5343-34035-6	Game Program PLS20	EPROM Assembly
IC29	A-5343-34035-7	Game Program PLS21	EPROM Assembly
IC30	A-5343-34035-8	Game Program PLS22	EPROM Assembly
IC43	A-5370-15717	Dual Power Amplifier	TDA 1552Q Audio IC
IC44	A-5370-15717	Dual Power Amplifier	TDA 1552Q Audio IC

LOWER PRINTED CIRCUIT BOARD SWITCHES

DESIGNATION	LOCATION	FUNCTION	POSITIONS	STATE	MEANING
SW1	MIDDLE RIGHT NEAR JP1	WARM RESET	1	OFF	NORMAL OPERATION
				ON	FORCED CPU BOARD RESET

UPPER PRINTED CIRCUIT BOARD SWITCHES

DESIGNATION	LOCATION	FUNCTION	POSITIONS	STATE	MEANING
SW1	MIDDLE RIGHT NEAR IC5	WARM RESET	1	OFF	NORMAL OPERATION
				ON	FORCED CPU BOARD RESET

CPU BOARD LED INDICATOR STATUS CHART

DESIGNATION	LOCATION	FUNCTION	COLOR	STATE	MEANING
D1	MIDDLE CENTER NEAR D2 & IC22	POWER INDICATOR	RED	OFF	NO POWER
				ON	NORMAL OPERATION
				BLINKING	FAULTY OPERATION
D2	MIDDLE CENTER NEAR D1 & IC22	CPU ERROR INDICATOR	RED	OFF	NO POWER
				ON	NORMAL OPERATION
				BLINKING	FAULTY OPERATION

SURF PLANET™ KIT

SECTION FOUR

TROUBLESHOOTING

This game uses complex electronic components that are very SENSITIVE to static electricity. The following precautions must be observed and followed prior to handling game electronics.

- 1. Ensure that the A.C. power to the game is turned OFF prior to servicing the electronics.**
- 2. Discharge any static electricity build up in your body by touching the safety ground stud of the power supply chassis while the line cord is connected to a properly grounded outlet. This is to be done BEFORE touching or handling the electronic assemblies.**
- 3. Store the electronic assemblies in an anti-static area. Anti-static bags are to be used to store or transport the game CPU Board Assembly.**
- 4. DO NOT remove or connect any electronic assemblies when the cabinet power is ON. Doing so will damage the electronic assemblies and void the warranty.**
- 5. Always replace ground wires, shields, safety covers, etc. when maintenance or service is completed. Ensure that all ground and mounting screws are installed and tightened firmly.**

GAME DOES NOT START

1. Game appears completely non-functional; no audio, no illumination, no video display.

- A: Check that the Power Switch has been turned ON (on power supply at rear of the main cabinet).
- B: Turn OFF the game power. Unplug the A.C. line cord. Examine the Power Supply fuse or circuit breaker. The Power Supply Line Voltage Switch must be set to agree with the local line voltage.
- C: Remove the Line Cord. Test the line cord, power plug and I.E.C. connectors for breaks or damage. Verify the continuity of each wire in the cord. Install the cord at the Power Supply and press firmly to fully seat the connector into the supply receptacle.
- D: Unlock and open the cabinet door or panel as required to expose the game electronics. Ensure that cabinet wiring harness connectors are fully seated in the corresponding power supply and board connectors (refer to Wiring Diagram, Section Three). Inspect wiring for breaks or damage.
- E: Examine the A.C. fuses on the A.C. chassis or the power supply, and the D.C. fuses on the chassis or the electronic equipment shelf. If any fuse is faulty, replace it with an identical fuse.
- F: Fully seat the A.C. plug in the power outlet. Verify that A.C. line voltage is present. Turn the game power ON. Check the D.C. wiring harness and connectors if fuse opens the circuit again.

2: Video game appears non-functional, but currency acceptor price indicator is illuminated.

- A: Unlock and open the cabinet door or panel as required to expose the game electronics. Inspect the electronics through top cover holes under low light level conditions. A glow will be seen from the Light Emitting Diodes (LEDs) if there is voltage in the processor circuits. This does not mean that voltages or signals are as they should be, but it does indicate that the CPU Board is receiving some D.C. power from the power supply. The power supply fan should also be operating.
- B: Turn OFF the game power. Inspect the Filter Board Assembly. Ensure that the JAMMA Wire Harness connector is attached and fully seated onto the Filter Board connector. Check the Filter Board to the edge connector of the PCB and other wiring harness connectors in the same way.

CAUTION: DO NOT REMOVE OR INSTALL ANY CONNECTOR WHEN POWER IS TURNED ON. DOING SO WILL DAMAGE THE CPU BOARD ASSEMBLY AND VOID THE WARRANTY.

- C: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the Power connector pins. Adjust the +5V source if it is necessary. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- D: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- E: Verify that the game runs and completes the power-up self-test sequence without any errors. Note errors and/or failures found during these tests. Compare the CPU Board Assembly Light Emitting Diodes with the LED Indicator Status Chart (Section Three) and note any discrepancies.
- F: Enter the game menu system by pressing and holding the TEST MODE switch. From the TEST MODE main menu, choose SCREEN ADJUSTMENT (refer to Section One for additional details). The COPROCESSOR and RAM tests should read "OK." If the test yields any other result, there is a problem with the PCB or its components. Contact your distributor for assistance with faults.

GAME CANNOT BE PLAYED

1. Game will not accept currency or tokens and cannot be started. Audio and video are present.

- A: Unlock and open the cash door. Empty the cash box. Inspect the revenue for any counterfeit currency. Check the vault and remove any items that block the path from the mechanism.
- B: Unlock and open the coin door. Check each mechanism by hand to ensure proper mounting. Remove the mechanism and clear the currency path. Reinstall the mechanism and latch it.
- C: Verify that the mechanism is level when the doors are closed. Repair or replace the coin door if it is bent or damaged. Adjust the cabinet leg levelers if necessary to keep mechanisms vertical.
- D: Enter the game menu system by pressing and holding the TEST MODE switch. From the TEST MODE main menu, choose SETTINGS (refer to Section One for additional details). Use this screen to confirm the pricing and setup of the mechanism used in the game.
- E: Verify that each coin mechanism is operating properly by placing it in a known good unit.

2. Game accepts currency or tokens, but does not start. Audio and video are present.

- A: Unlock and open the coin door. Check each mechanism by hand to ensure proper mounting. Verify that each of the release latches is in the closed and locked position. Test known good and bad coins to see if the mechanism accepts and rejects the currency correctly.
- B: Ensure that no loose parts or wires are caught in the hinges, latches, or switch contacts.
- C: Inspect to see if the external coin door indicators (pricing, flashing arrows, etc.) are illuminated. Check connectors and cables for wiring continuity from Filter Board to the coin mechanisms.
- D: Enter the game menu system by pressing and holding the TEST MODE switch. From the TEST MODE main menu, choose SETTINGS (refer to Section One for additional details). Use this option to confirm the pricing and setup of the mechanism used in the game.
- E: Check for continuity in each of the suspect switch connections (Common to Normally Open or Common to Normally Closed). Replace faulty switches (bent levers, broken actuators, etc.).
- F: Verify that each coin mechanism is operating properly by placing it in a known good unit.

3. Bill validator does not function after field installation. Coin mechanisms operate properly.

- A: Inspect to see if the external coin door indicators (pricing, flashing arrows, etc.) are illuminated. Ensure that no loose parts or wires are caught in the hinges, latches, or switch contacts. Verify that the harness connectors are attached and fully seated. Check for validator cable continuity.
- B: Turn OFF the game power. Wait a few minutes, then turn the game ON. Insert coins or tokens and watch for on-screen credits indication. Insert bills and watch for on-screen credits indication. Compare the bill validator's switch settings against the manufacturer's set up instructions.
- C: Verify that the bill validator is operating properly by placing it in a known good unit.

CONTROL PROBLEMS

1. Player controls are intermittent or completely non-functional. Game starts normally.

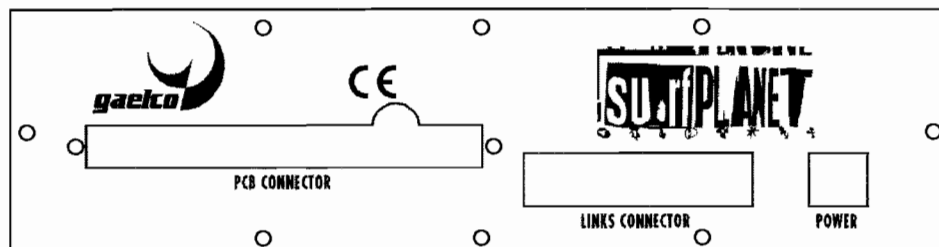
- A: Unlock and open the coin door. Enter the game menu system by pressing and holding the TEST MODE switch inside the coin door. From the TEST MODE main menu, choose the CONTROLS test (refer to Section One for additional details). OK should appear on the screen only when a switch is activated. Use these tests to confirm the operation of each switch used in the game.
- B: Move the joystick to its extreme left position. The JOYSTICK INPUT value should be from 0-35. The position indicator will change color and a beep will be heard if this test result is acceptable.
- C: Move the joystick to its extreme right position. The JOYSTICK INPUT value should be 220-255. The position indicator will change color and a beep will be heard if this test result is acceptable.
- D: Move the joystick to its exact center position. The JOYSTICK INPUT value should be 125-130. A beep will be heard if this test result is acceptable (*the position indicator will not change color*).

If joystick fails one or two of the tests from steps B, C, or D above, go to CALIBRATION below. If joystick fails all the above tests and can not be calibrated correctly, continue with step E.

- E: Turn OFF the game power. Unlock and open the coin door or rear door as needed to reach the control panel fasteners. Unlatch the control panel. Grip the joystick and carefully tilt the panel back on its hinge. Ensure that no loose parts or wires are caught in hinges, latches, or switches.
- F: Check that the cabinet wiring is correct for this game. Ensure that the controls are properly connected to the control input wires from the joystick wiring harness and the JAMMA connector. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information.
- G: Verify continuity in each of the switch connections (Common to Normally Open or Common to Normally Closed). Ensure that the control is operating properly by placing in a known good unit.

2. Joystick Calibration is not correct (refer to steps A-D above). Game starts normally.

- A: Unlock and remove the rear door of the cabinet. Locate the game electronics assembly. There is a CE symbol on the end panel of the enclosure where the Filter Board Assembly is attached. A semicircular notch is provided to allow adjustment of the centering potentiometer (see illustration).
- B: Move the joystick to exact center position. The JOYSTICK INPUT value should be exactly 128. Use a small screwdriver to turn the centering potentiometer until this value is indicated on screen.
- C: Turn OFF the game power, wait ten seconds, and turn it ON again. Press and hold TEST MODE, then choose CONTROLS as before. The JOYSTICK INPUT value should still be exactly 128.
- D: Repeat steps C and D until INPUT value remains at 128 each time power is cycled OFF and ON.



LOCATION OF NOTCH FOR JOYSTICK CENTERING ADJUSTMENT

LINKING PROBLEMS

1. Cannot connect games together. Linking cables are not present with the kits.

A: A linking cable is required to set up interconnection. Each cable connects two games (one pair). Contact your local distributor to obtain the special linking cable for this game.

B: This linking system uses high grade computer type cable for the game data exchanges. Do not substitute other cables or communication wiring without factory authorization.

2. Game functions correctly by itself, but does not recognize other players in linking operation.

A: Note and record any error messages that occur during self-test. Open the coin door. Press and hold the TEST MODE switch to enter the menu system. From the TEST MODE menu screen, select SCREEN ADJUST. Check that the MACHINE NO. is different for each cabinet. A unique number is required for linked cabinets. Choose BACK TO MENU to return to the previous screen.

B: From the TEST MODE menu screen, choose SETTINGS. Select MACHINE NO. on the screen of one cabinet and change the number so that one cabinet is 1UP and the other cabinet is 2UP.

C: From the SETTINGS menu screen, select LINK MODE on the screens of both cabinets. Change the value to ON for both cabinets. Change coins, credits, or volume as necessary at this time.

D: Unlock and open the rear door. Verify that the linking cable is connected to the CPU/PCB Board. Use only the right side near the POWER connector on the game electronics assembly end panel.

E: Verify that each linking cable is operating properly by placing it in a known good unit.

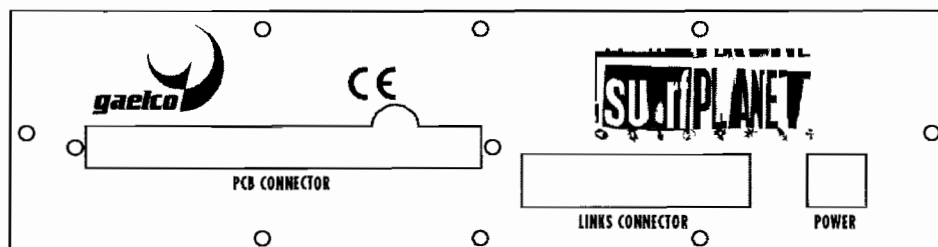
3. Some game pairs in a group link properly while others do not. There may not be any sound.

A: Turn Off power on cabinets, wait two minutes, and turn both units On (this clears some errors).

B: All linked cabinets require the same software version. Unlock the coin door and press the TEST MODE button on both cabinets. From the TEST MODE menu screen, select SCREEN ADJUST. Check that the VERSION is the same for each cabinet. Different versions may not be compatible. It does not matter which revision level is installed, only that linked game pairs must be the same.

C: *Do not use a cable-to-cable connector and another cable to extend a linking connection.* Transmit and receive line pairs must interconnect for data exchange to occur between games. Some cable couplers cross connect, which will cancel out and cause the same problem as no link crossover.

D: Separate communications wiring from other wiring, especially line cords. If unavoidable, cross at right angles to limit noise pickup. *Do not bundle linking cables with power or any other wires.*



LOCATION OF CONNECTOR FOR LINKING CABLE

AUDIO PROBLEMS

1: Audio is not heard, but video is present and game appears normal (also see Linking Problems).

- A: Enter the game menu system by pressing and holding the TEST MODE switch. From the TEST MODE main menu, choose SETTINGS (refer to Section One for additional details). Verify that DEMO SOUND is set to ON or EVERY 4 and game volume level is above minimum (not zero). Change the levels if necessary to make the game audible. DEMO SOUND affects "attract" music.
- B: Follow the on-screen instructions to return to the first menu. From the TEST MODE main menu, choose SOUND TEST. Use these tests to confirm the operation of each speaker in the cabinet.
- C: Turn OFF the game power. Remove grilles and inspect speakers. Ensure that no loose parts or wires are caught in speaker cones, terminals, mounting screws, or stuck to the magnets.
- D: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the Power connector pins. Verify the +5V, -5V and +12V sources. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- E: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- F: Verify proper operation of game CPU Board Assembly by placing it in a known good game.

2: The audio is distorted, muffled or missing frequencies. A constant low hum may be present.

- A: Enter the game menu system by pressing and holding the TEST MODE switch. From the TEST MODE main menu, choose SOUND TEST. These tests will verify the speaker connections.
- B: Turn OFF the game power. Remove the grilles and check the speakers. Ensure that each small speaker is FULL RANGE (100 to 10,000 Hz response) and rated for at least 10 WATTS. The larger speaker must rate at least 25 WATTS.
- C: Check that the speaker wiring is not reversed at one of the speakers. Weak low frequencies and a thin or hollow sound quality are symptoms of incorrectly phased speakers. This condition will not be detected by the SOUND TESTS, but it will be audible during normal game operation.
- D: Check that the cabinet wiring is correct for this game. Verify that the cabinet wiring provides separate wires (not a common return) for each speaker. Ensure that all cabinet ground wires are connected. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information.
- E: Using the 2 Volt A.C. setting on a digital voltmeter, measure voltages at the speaker terminals. Any reading here indicates that the supply voltages are unstable and may contain ripple or noise.
- F: Verify that each speaker is operating properly by placing it in a known good unit.

3: The audio is monaural (it should be stereo). The separate woofer may not be functioning.

- A: Verify that cabinet wiring for this game is correct. Ensure that speakers are connected to the JAMMA audio output wires at the Filter Board Assembly. Check for shorted or broken wires. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information.
- B: Check continuity between the optional woofer and its harness and the WFR connector.

VIDEO PROBLEMS

1. Monitor appears non-functional, but audio is present and controls operate as expected.

- A: Open the cabinet to expose the Video Monitor. Verify that A.C. Power is connected to the Video Monitor. Inspect the neck of the CRT under low light level conditions. A glow will be seen near the CRT base if there is voltage in the filament circuits. This does not mean that other voltages or signals are as they should be, but it does indicate that monitor circuits are receiving some power.
- B: Turn OFF the game power. Verify that the Video Signal and the Remote Adjustment Board connectors are fully seated on the Video Monitor Board Assembly. Check the other monitor connectors in the same way. **Do not operate a monitor without a Remote Adjustment Board.**
- C: Examine the A.C. line fuse on the Video Monitor Board Assembly. If the fuse is faulty, replace it with an identical fuse of the proper voltage and current rating.
- D: Ensure that no loose parts or wires are caught on the chassis or the mounting brackets.
- E: Check that the brightness (intensity) and contrast have not been set to their minimum levels.
- F: Verify that the Video Monitor is operating correctly by placing it in a known good unit.

2: The power-up self-test will run, but the game does not appear. No audio is present.

- A: Note and record any error messages that occur during self-test. Enter the game menu system by pressing and holding the TEST MODE switch. From the TEST MODE main menu screen, choose SCREEN ADJUSTMENT. This test checks some of the CPU functions in this game. Note any errors in the COPROCESSOR or RAM reports (both must report OK for proper game operation).
- B: Turn OFF the game power. Unlock and open the front door. Inspect the game electronics. Ensure that the Filter Board Assembly connector is fully seated into the mating connector of the CPU/PCB Board Assembly. Verify that all Filter Board Assembly mounting screws are installed.

CAUTION: DO NOT REMOVE OR INSTALL ANY CONNECTOR WHEN POWER IS TURNED ON. THIS WILL DAMAGE THE CPU BOARD OR HARD DISK DRIVE AND VOID THE WARRANTY.

- C: Verify that the ROM instruction set is correct for this game. There is more than one ROM in a game set. Each ROM circuit is labeled with the assembly number and the software version.
- D: Verify that the CPU Board Assembly is correct for this game. Each CPU Board is marked with the manufacturer name, assembly number and the hardware version.
- F: Turn ON the game power. Using the 20 Volt D.C. setting on a digital voltmeter, measure D.C. voltages present at the Power connector pins. Verify the +5V source if it is adjustable. Refer to the Cabinet Wiring Diagram (Section Three) for specific wiring information and voltage limits.
- G: Using the 2 Volt A.C. setting on a digital voltmeter, measure the same D.C. voltages as above. Any reading indicates that the supply voltages are unstable and may contain ripple or noise.
- H: Compare CPU Board Light Emitting Diode states with the CPU Indicator Chart (Section Three).

3. Monitor will not lock onto the signal and provide a stable picture, colors are missing, etc.

- A: Check connectors and cables for wiring continuity from the CPU Board to the Video Monitor. Verify all jumpers are set correctly for this monitor. Refer to Board Configuration (Section Three).
- B: Ensure that the Video Monitor Assembly is correct for this game. Use of video monitors with different resolution will result in what appears to be horizontal tearing or complete loss of sync.
- C: Verify that the Video Monitor is operating correctly by placing it in a known good unit. Interlaced video signals may cause jitter or vibration with some displays; try another brand of Video Monitor.

4: Game operates normally, but video picture wavers or rolls, has dark bars, uneven colors, etc.

- A: Check connectors and cables for wiring continuity from the CPU Board to the Video Monitor.
- B: Ensure that all the cabinet ground wires are connected, especially at the Video Monitor Chassis.
- C: Move the cabinet farther away from machines, appliances, other games, etc. Very strong electrical or magnetic fields are present near some equipment when it is operating normally.
- D: Verify that the Video Monitor is operating correctly by placing it in a known good unit. Interlaced video signals may cause jitter or vibration with some displays; try another brand of Video Monitor.

MISCELLANEOUS

2: Marquee lamp is intermittent or non-functional. Game starts and plays normally.

- A: Open the cabinet marquee or attraction panel. Remove the lamp end locks and the fluorescent tube from the holders. Install a new lamp if cracks or darkened ends are found. Clean the tube.
- B: Verify that the lamp and starter pins are making good connection with their socket contacts.
- C: Measure the A.C. voltages to the Fluorescent Lamp Assembly (Power Wiring Diagram, Section Three). Check wiring and connector continuity from the A.C. Power Chassis to the Lamp.
- D: Ensure that the Fluorescent Lamp Ballast is rated for the local A.C. line voltage and frequency.
- E: Verify that the lamp, starter, and ballast operate by placing one at a time in a known good unit.

3. Game operates normally, but fan is noticeably noisy.

- A: Check bottom and rear of cabinet for blocked air flow. Move game away from sources of heat.
- B: Turn OFF the game power. Apply high power vacuum cleaner to vent holes to remove dust.
- C: Open the cabinet to expose the electronics. Ensure that the fan is connected to wiring harness.

4. Error Messages appear on the screen. The game does not start and there is no audio.

- A: Check any assembly (Joystick, RAM, ROM, etc.) identified in the Error Message.
- B: Call your authorized distributor for help with unresolved screen messages.

WARNINGS & NOTICES

WARNING

USE OF NON-ATARI PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY ATARI AUTHORIZED PARTS.

* Substitute parts or modifications may void EMC directive or FCC type acceptance.

* For safety and reliability, substitute parts and modifications are not recommended. Use only ATARI authorized components and parts. Failure to do so will void warranty and may result in incorrect and/or unsafe operation.

* This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under federal law. This also applies to ATARI logos, designs, publications and assemblies. Moreover, facsimiles of ATARI equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles are manufactured with ATARI components.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generated, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

When ATARI ships a game, it is in compliance with FCC regulations. Your label is proof. If the label is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game does not contain an FCC label, call ATARI immediately.

WARNING

Plug this game into a properly grounded outlet to prevent shock hazards and assure proper game operation. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

WARNING

A very small portion of the population has a condition which may cause them to experience epileptic seizures or have momentary loss of consciousness when viewing certain kinds of flashing lights or patterns that are present in our daily environment. These persons may experience seizures while watching some kinds of television pictures or playing certain video games. People who have not had any previous seizures may nonetheless have an undetected epileptic condition.

If you or anyone in your family has experienced symptoms linked to an epileptic condition (e.g. seizures or loss of awareness), immediately consult your physician before using any video games.

We recommend that parents observe their children while they play video games. If you or your child experience the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements, loss of awareness, disorientation, or convulsions, DISCONTINUE USE IMMEDIATELY and consult your physician.

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