

Installation Manual



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- AAMA decal must not be removed from the PCB. Warranty voided if removed.

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This equipment complies 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 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.



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1 GETTING STARTED

Game Package Contents

- (1) Printed Circuit Board (PCB) Assembly
- (1) Connecting Wire Harness (JAMMA)
- (1) Trackball Assembly w/Metal Plate
- (1) Trackball Cable Assembly
- (3) Button Assemblies
- (1) Marquee Styrene
- (1) Marquee Plexiglas
- (1) Control Panel Overlay
- (1) Set of Function Labels
- (1) Manual

Recommended Tools and Supplies

- Phillips and Slotted Screwdrivers
- Socket Set
- Wire Cutters and Strippers
- Pliers or Channel Locks
- Electric Drill with 3/32", 1/4", and 7/16" Bits
- Chassis or Sheet Metal Punch
- Small File
- Razor Knife and Sharp Blades
- Straight Edge
- Staple Gun and Staples
- Soldering Iron and 60/40 Resin Core Solder
- Vacuum Cleaner
- Assorted Fastening Hardware
- Heat Shrink Tubing (3/32", 1/8", and 3/16")
- Masking Tape or 4" Wire Ties

IF YOU DO YOUR OWN PAINTING, YOU'LL NEED THESE PAINT SUPPLIES:

- Air Brush or Paint Sprayer
- Paint Roller and Pan
- Paint Brush
- Paint (and Primer)
- Sandpaper
- Putty Knife and Wood Putty

2 INSTALLATION PREPARATION

BEFORE YOU START.....

Check to see if all the needed parts have been included in your kit (See Game Package contents.)

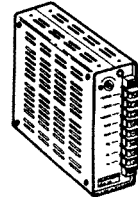
1. Do you have the necessary tools? (See Recommended Tools and Supplies.)
2. Do not work with any part of the system plugged in (lights, monitor, or power supply).

The Cabinet

Power Requirements

Make sure the game you have chosen to convert is able to supply all the required voltages for SHUFFLE SHOT.

+5 VDC 5 amps
+12 VDC 2 amps



WARNING!!!

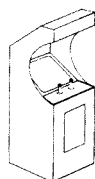
The output level of many "regulated" switching power supplies actually vary with load. For this reason, the power supply from an old game may not be correctly adjusted for SHUFFLE SHOT. This makes the existing power supply inappropriate and hazardous to your new game. Therefore, it is very important to adjust the +5 VDC supply WITHOUT connecting the PCB, then readjusting it later, after the PCB has been installed. Measure power on the PCB, across an I.C.. Damage will occur if the power supply is outside the acceptable limits (between 4.8 and 5.5 VDC.)

Monitor Requirements

SHUFFLE SHOT requires a monitor in a horizontal mount raster scan with positive or negative composite SYNC. It can be difficult to change the monitor from vertical to a horizontal unit, therefore, installation will be easier if you choose a horizontal mount cabinet.



Cabinet Selection



You can choose either a new cabinet or a used cabinet for your SHUFFLE SHOT game. Reusing a cabinet is by far the most cost-effective way to maximize the return of your initial investment. In either case, all you need to provide is the cabinet with a power supply and monitor. We provide the rest. The end result is a new game at a very low cost.

NOTE:

It is recommended that a large control panel with a 25" monitor, like those on a 4-player cabinet, be used for your SHUFFLE SHOT.

When selecting a cabinet, keep this in mind:

A cabinet with a 25" monitor and a large control panel will allow you to mount the trackball farther from the monitor. This prevents players hands from hitting the monitor glass when rolling the trackball forward, and will earn better than a smaller control panel with a smaller monitor.

Preparing a used cabinet for SHUFFLE SHOT

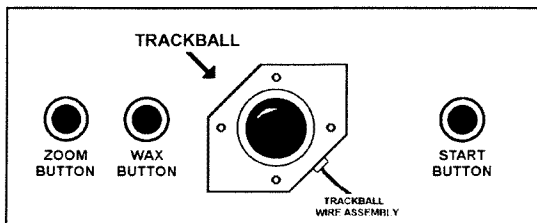
- Remove the following from the cabinet:
 - Main Logic Board(s)
 - Control Panel
 - Monitor Plexiglas
 - Marquee
 - Cabinet Graphics
- Thoroughly clean out your cabinet. Remove all the old buttons, joysticks and wires from the control panel. **DO NOT** remove monitor and speaker wires.
- Remove the old graphics and adhesive from the control panel, and the side of the cabinet. Remove adhesive with solvent.
- For a fresh look, painting is highly recommended. Spray painting gives a better finish, but if an air brush or paint sprayer is unavailable, a roller is second best. Remember to cover all exposed surfaces not to be painted.
- Remember, spending time on the cabinet's appearance (i.e., marquee, control panel, and cabinet graphics) will raise your profits with the introduction of a new game package, especially if the cabinet looks clean and new.
- The "new game look" should always apply to the inside of your game as well. A few wire ties and shrink tubing on your harness, some fastening hardware on your subassemblies, and a sweep with the vacuum cleaner will ensure that glitches do not occur.

The Control Panel

Mounting the trackball correctly and securely is very important for the profitability of your new game. Follow these instructions carefully for mounting the trackball to: 1) a metal control panel; 2) a wooden control with routing; 3) or a wooden control panel without routing. (Refer to template inserts found in the back of the manual.)

NOTE:

Installing the trackball and overlay as far away from the glass as possible will prevent players hands from hitting the monitor glass when rolling the trackball forward. Also the trackball should be centered on the control panel for best results.



CONTROL PANEL LAYOUT

(Trackball **MUST** be centered on the control panel)

Trackball Preparation

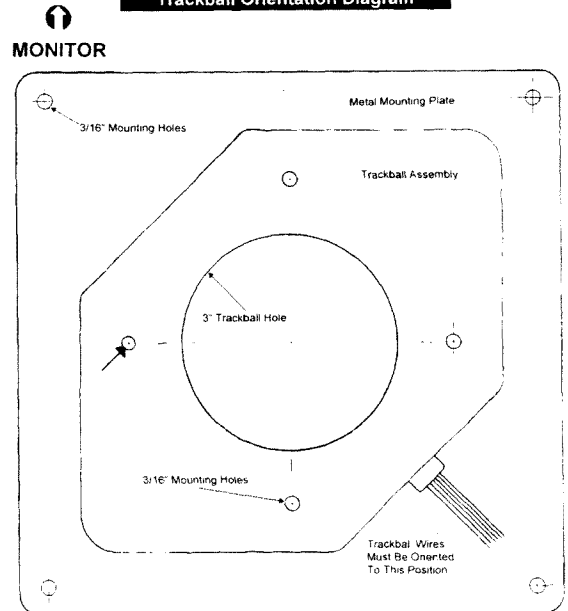
When making the hole for the trackball, follow the instructions starting on this page and the next, for the type of control panel you will be using.

NOTE:

When installing the trackball, make sure the trackball is in the correct orientation. (Refer to picture below.)



Trackball Orientation Diagram



PLAYER

IMPORTANT:

Position the trackball as far away from the monitor as possible. Be sure the trackball is mounted straight and in the correct orientation.

TRACKBALL ORIENTATION (NOT DRAWN TO SCALE)

IMPORTANT!:

The supplied trackball comes equipped with a grounding cable. This cable must be connected to field ground to protect the trackball P.C. boards from becoming damaged by electro-static discharge.

**To mount trackball to a metal control panel, use
Trackball Mounting Template #1**

1. Fill any existing holes in the metal control panel.
2. Place and secure TEMPLATE #1 to your control panel in the desired location.
NOTE: The trackball should be as far away from the monitor as possible and centered in the middle of the control panel.
3. Carefully drill the holes for the ball and the mounting bolts using the template as a guide.
4. Remove template and file down any rough edges.
5. See The Graphics Overlay section on page 6 on how to install the graphics.
6. Mount trackball under the metal control panel using the four carriage bolts.
NOTE: Be sure the trackball is mounted as shown in the diagram on page 4.
NOTE: Do not over-tighten the trackball. It will warp and cause the trackball to not operate correctly.
NOTE: The supplied metal plate is not needed with metal control panels.
NOTE: Be sure to mount the trackball so as much of the ball is exposed as possible.
7. Securely fasten the trackball grounding wires to Field Ground in your cabinet. This step is important in reducing static buildup and discharge caused by the trackball.
8. If using Plexiglas on your control panel, it is highly recommended that a 3-1/2" hole be cut in the Plexiglas for the trackball. This allows for players to use the full height of the trackball. Carefully file and smooth the edges of the hole in the Plexiglas so players do not cut their hands when playing.

**To mount trackball to a wooden control panel with routing
capability use Trackball Mounting Template #2**

1. Fill any existing holes in the wooden control panel.
2. Place and secure TEMPLATE #2 to your control panel in the desired location.
NOTE: The trackball should be as far away from the monitor as possible and centered in the middle of the control panel.
3. Carefully cut the hole for the trackball in the shape indicated on the template.
4. Drill the mounting holes indicated.
5. Next route out the shaded area indicated on TEMPLATE #2, 1/16" deep. Use a 1/2" Rabbeting Bit for best results. This is so the supplied metal plate will be flush with the control panel surface.
6. Remove template and file down any rough edges.
7. See The Graphics Overlay section on page 5 on how to install the graphics.
8. Mount trackball to the metal plate using the four carriage bolts supplied. Then mount the metal plate to the wooden control panel.
NOTE: Be sure the trackball is mounted as shown in the diagram on page 4.
NOTE: Do not over-tighten the trackball. It will warp and cause the trackball to not operate correctly.
NOTE: Be sure to mount the trackball so as much of the ball is exposed as possible.
9. Securely fasten the trackball grounding wires to Field Ground in your cabinet. This step is important in reducing static buildup and discharge caused by the trackball.
10. If using Plexiglas on your control panel, it is highly recommended that a 3-1/2" hole be cut in the Plexiglas for the trackball. This allows for players to use the full height of the trackball. Carefully file and smooth the edges of the hole in the Plexiglas so players do not cut their hands when playing.

To mount trackball to a wooden control panel without routing capability use Trackball Mounting Template #3

1. Fill any existing holes in the wooden control panel.
2. Place and secure Template #3 to your control panel in the desired location.
NOTE: The trackball should be as far away from the monitor as possible and centered in the middle of the control panel.
3. Carefully cut the hole for the trackball in the shape indicated on the template. The trackball should fit the hole shape exactly.
4. Drill the mounting holes as indicated.
5. Remove template and file down any rough edges.
6. Using the Trackball Orientation template, cut a 3" hole in the Plexiglas overlay to fit over the trackball. Be sure to include holes for the buttons, and all of the mounting bolts.
7. See The Graphics Overlay section on page 5 on how to install the graphics.
8. Insert the trackball into the newly cut hole. Place Plexiglas overlay on top of the control panel. Place the supplied metal plate under the trackball and use the carriage bolts to secure it to the control panel. The metal plate below and the Plexiglas above will secure the trackball assembly into position.

NOTE: Be sure the trackball is mounted as shown in the diagram on page 4.

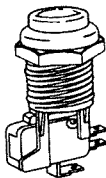
NOTE: Do not over-tighten the trackball. It will warp and cause the trackball to not operate correctly.

NOTE: Be sure to mount the trackball so as much of the ball is exposed as possible.

9. Securely fasten the trackball grounding wires to Field Ground in your cabinet. This step is important in reducing static buildup and discharge caused by the trackball.

Button Preparation

1. When making the holes for the buttons, use the labels as a guide to where you want to drill your new holes, and then cut a 1" hole in the center of where the labels are to be placed. **DO NOT** stick the labels to the panel at this time.
2. Drill or punch the holes marked for buttons or bolts. Use a chassis or sheet metal punch for best results on button holes.
3. Use a file to smooth any rough edges on the holes.
4. Fill any old and unused holes with wood, resin, or a metal plate.
5. It is recommended that you cover your control panel with Plexiglas. Now would be a good time to cut it to fit while the dimensions and tools are at hand.



The Graphics Overlay

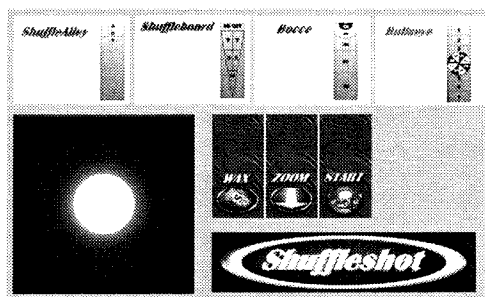
SHUFFLE SHOT comes equipped with graphics that will accommodate a variety of existing game cabinets.

Control Panel Overlay Installation

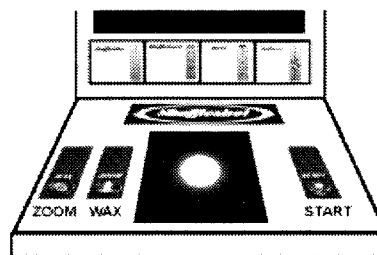
1. Make sure the control panel is clean and free from dust, grease, metal filings, and sawdust. Your control panel should be painted white, with all holes filled for optimal results. The background overlay provided with the game is oversized to accommodate most control panel sizes. Be sure to leave enough excess material above and below the control panel in order to trim it evenly.
2. Remove the protective backing from the overlay. Center the overlay over the control panel and place down gently, making sure to keep it square. Using your hands, press down firmly, starting from the center and smooth the overlay outward, making sure all bubbles have been pressed out for a clean, flat surface.
3. Using a sharp razor knife, trim any excess from the overlay. Carefully pierce through the overlay above each control panel hole that you have marked. Cut out material covering the pre-drilled holes with the razor knife. Be sure to cut the overlay above each hole and trim cleanly and evenly.

Function Labels Overlay Installation

Line up the supplied function labels with the corresponding control panel holes. Remove the backing and carefully press into place. Be sure they are straight. Place the SHUFFLE SHOT logo above the trackball on the control panel. Place the game instructions on your monitor bezel. Refer to the diagram below.



FUNCTION LABELS (SUPPLIED)



PREFERRED CONTROL PANEL LAYOUT

Marquee Installation

If your cabinet needs a new marquee glass, determine the correct size and cut the Plexiglas (supplied) to fit. Using the old marquee glass as a template, center the Plexiglas on your new marquee graphics, making sure that all the printed images will be visible. Using a razor knife, score the new marquee deeply, following the edges of the old glass. Carefully break off the styrene. Be sure the light behind the marquee works and that the glass is clean on both sides. Now install the marquee graphics and glass securely.

Wiring and Hardware Assembly

REMEMBER! DO NOT WORK WITH ANY PART OF THIS SYSTEM PLUGGED IN (Lights, Monitor, or Power Supply).

NOTE:

All switch wires used in this game need to be wired to the normally open connection on the switches. Each switch requires a ground wire on the common connector and the appropriate control or switch wire on the other normally open connector of the switch.

Control Panel Assembly

1. Install the trackball and buttons on the control panel by following the detailed instructions beginning on page 3. The two blue buttons are used for ZOOM and WAX. The white button is used as the START button. PLEASE NOTE: If you want your new game to earn money, you must install the trackball correctly.
2. If you are using Plexiglas for added protection, don't forget to place it on the panel before inserting the buttons.
3. Wire the trackball and buttons using the JAMMA Harness Connection table on page 23. Connect the trackball using the supplied trackball cable into JP7 on the Memory Board.

IMPORTANT!:

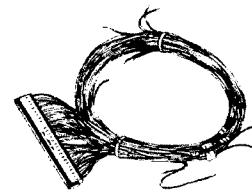
The supplied trackball comes equipped with a grounding cable. This cable must be connected to field ground to protect the trackball P.C. boards from becoming Damaged by electro-static discharge.

Printed Circuit Board (PCB)

Mount the PCB to the side of the cabinet with the connector toward the top of the drawer. This will keep the wire harness from slipping off due to vibration. Mark and drill pilot holes (3/32") onto the cabinet side, being careful not to drill through to the outside. Attach the PCB standoffs to the cabinet using wood screws and spacers, snug but not too tight or the board may warp or crack. Be sure the board is not being flexed in any way.

Wire Harness

1. If you are installing SHUFFLE SHOT into a Dynamo cabinet with a pre-installed JAMMA harness, you will notice that it does not have a wire for the test switch. You will have to add a contact to the edge connector at the proper position (position 15). Some cabinets (Dynamo included) have only one coin switch input and the coin switches are wired together. Connect the designated wires to the coin switches separately.
2. Attach the wire harness connector to the PCB. Be sure it is mounted correctly. **WARNING!** - Make sure you have identified PIN 1 on the connector before powering up. Plugging the JAMMA connector in backwards will cause damage to the PCB.
3. It is best to use connectors (not supplied) whenever joining a set of harness wires to a subassembly. If you choose to solder wires together, follow this procedure:
 - Strip off about 1/2" of insulation from the wire.
 - Slide a piece of heat-shrink tubing over the end.
 - Do not leave a lot of excess wire spooled up in your cabinet. Cut the wires to the length you need plus a few extra inches. Leave enough for proper cable dressing. Do not make it stretch across the inside of the cabinet.
4. Solder the new wire to the original wire. Use a straight in-line splice.



Power Wires

1. Connect the wires that are designated for your power supply. You will need a supply of +5 vdc, and +12 vdc. The +5 vdc must be regulated to within 5% (+ or - 0.25). The +12 vdc may be unregulated but should not stray too far or the sound may be affected. If the cabinet's supply does not provide these voltages, it will have to be replaced. A switching-type supply is recommended.
2. You will notice that you have more than one wire for each voltage. Use all wires supplied on the harness. This will ensure better power transmission and prevent overloading of the edge connector pads.
3. Tin all power supply wires before connecting them to the power supply. Loose strands may short out the supply. For best results, connect spade lugs to the ends of the power wires and attach to the screw terminals of the power supply.

Monitor Wires

You will be connecting the RED, GREEN, and BLUE video drives along with the composite SYNC and video GROUND wires.

Speaker Wires

Connect the speaker wires paying attention to their polarity.

NOTE:

If your cabinet has two speakers, connect both. If they are 8 or 16 ohm speakers, connect them in parallel, if they are 4 ohm, connect them in series.



NOTE:

Examine the speaker carefully. Is it really up to the high standards you wish to maintain at your location? Unfortunately, many arcade speakers are inadequate for reproduction of good game sounds. Remember, this is not just a video game -- it is a video/audio game investment. Far more effort was put into the sounds of this game than is put into most other arcade games. If the speakers are not up to it, replace them. A small investment in good speakers can make a world of difference in profits.

Position speakers as far from the monitor as possible. If placed too close, the speaker's magnet may deflect the monitor and cause strange coloration, which can usually be corrected by degaussing the monitor. Make sure everything else in the cabinet is attached securely for the same reason.

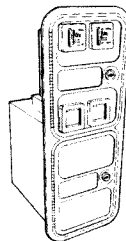
SYNC

This is the recommended approach for a Wells-Gardener monitor and should work with others as well.

If your monitor does not have a composite SYNC input but has separate horizontal and vertical SYNC inputs, try connecting the composite SYNC signal from the PCB to the negative horizontal SYNC signal on the monitor. This should produce a satisfactory result, although some adjustment of the monitor's SYNC controls may be necessary.

Coin Doors, Test Switch and Service Button Wiring

1. Wire the coin doors and the test / service switch(es) as per the JAMMA Harness Connection table on page 23.
2. Connect the door lamps to the +12 vdc supply. Some games have separate power supply outputs for the lamps.
3. Install a test switch somewhere convenient inside the coin door area. This switch allows you to enter adjustables, run diagnostics, and see or clear audits. Make it readily accessible through the coin door. Wire it to the Test wire on the JAMMA Harness.
4. Install a service switch (not included) somewhere convenient inside the coin door area. This switch allows you to give credits to players without affecting the game's credit audits or coin meters. Example: A player puts in a coin and gets no credit, the operator can then push the service button and a credit is given to the player without affecting the game's audits and coin meter.
5. Clean and lubricate your coin mechs.



Ticket Dispenser Installation

This game is capable of dispensing tickets through a Deltronics DL-1275 or similar ticket dispenser. Connection is through the 4-pin Molex plug at the right edge of the Main board marked "TICKET". It is pinned out as follows:

PIN FUNCTION

- 1 Ticket Sense
- 2 Ground
- 3 Motor Enable
- 4 +12 vdc

This is the same pin out (with a different connector) as the Deltronics DL-1275. If you wish to connect a ticket dispenser to this game you will have to make a cable with the proper connectors. The DL-1275 mates with a Molex #03-09-1041 or #03-09-1042. The game board connector mates with a Molex #22-01-2047 or #22-01-3047. Simply connect pins 1 through 4 on one end directly to pins 1 through 4 on the other end. If the ticket dispenser is not a DL-1275 you may need a different cable. Other electro-mechanical devices can be connected through this connector provided they use the same signals. The Motor Enable output is TTL-compatible and is high when the motor is turned on. The Ticket Sense input expects an open-collector TTL signal where low indicates the sensor is not blocked. When a ticket is to be issued, the Motor Enable line goes high until either the Ticket Sense line goes high then low again (indicating a ticket has passed) or until about 1/3 of a second passes (meaning dispenser is empty or jammed).

Final Check

1. Check the game inside and out for any imperfections. Secure any loose wiring or fastening hardware.
2. Make sure the coin door is tight and the coin mechs are well adjusted.
3. Make sure all assemblies are firmly attached. Anything that is not mounted securely will rattle when the game is played. This game makes use of low-frequency sounds which can cause any loose joints to rattle.

3 INITIAL START-UP

1. Attach the JAMMA Harness. Plug in the game and turn it on.

WARNING!!!

Make sure the harness is plugged in correctly. Damage to PCB will occur if JAMMA connector is plugged in wrong.

2. Look and smell for smoke (TURN IT OFF IMMEDIATELY IF ANY IS NOTICED).

NOTE:

Use the Voltage Test screen to adjust your power supply. When the screen says "Voltage OK", your power supply is properly adjusted to 5.2 volts on the PCB. Adjust the +5 Volt supply so that you read 5.2 Volts across an I.C. on the circuit board. If measured at the power supply, the reading will be higher at the power supply outputs.

3. Make sure the green and yellow LED on the PCB are flashing. If not, something is wrong, turn off the game.
4. Listen for sound. Sounds should be heard in the attract mode.
5. If you do not hear any sounds and the yellow LED is flashing, try turning up the volume and check the speaker connections. Dropping a coin through a coin switch should cause a sound.
6. How is the picture? Is it centered? Is it too bright or too dim? Is it in focus? Adjust your monitor to get the best picture possible.

NOTE:

Check your monitor manual to make adjustments. Some test patterns are available through the game's system tests by pressing the Test switch. Use them when making any adjustments. (See SYSTEM TESTS information on page 25. Proper monitor adjustment is very important.)

7. Try all coin switches. Drop quarters or tokens through to check the coin mechs. Make sure the game is adding credits. You can use the Player Control Tests by pressing the test switch and entering the SYSTEM TEST MENU. Do all of the controls work? Try playing the game with the volume up and listen for rattling as you play. Tighten anything that is making noise.

8. You can automatically run a series of quick-system tests upon power-up. With the game off, press and hold the START button. Continue to hold the button down and turn the game on. The software will automatically run the Video RAM, GROM and Sound tests, and end on the Player Control Test screen. Press the ZOOM and WAX buttons together to exit the test and return to the game mode.
9. Upon initial power-up, the game will initialize to factory default settings. These settings affect game elements such as number of credits per coin, difficulty settings, etc. The OPERATOR ADJUSTABLES MODE section will describe how to alter these settings and view the game audits or run system tests.

4 DIP SWITCH SETTINGS

The main dip switches can be found on the PCB near the JAMMA (SW1).

Dip switch 4(ON):	Always "ON" (DEFAULT)
Dip switch 4(OFF):	** NOT USED **
Dip switch 3(ON):	** NOT USED ** (DEFAULT)
Dip switch 3(OFF):	** NOT USED **
Dip switch 2(ON):	Always ON (DEFAULT)
Dip switch 2(OFF):	Freezes the screen
Dip switch 1(ON):	Normal Game Play (DEFAULT)
Dip switch 1(OFF):	Operator Mode Menu

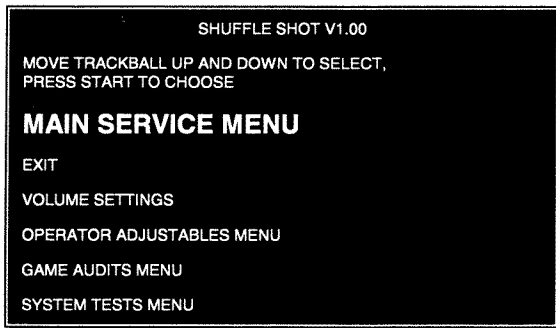
There are also dip switches near the green LED (SW2). Switches #1 and #2 must be "ON" and switches #3 and #4 should be "OFF".

5 MAIN SERVICE MENU

To enter the MAIN SERVICE MENU, press the Test Button, located just inside the coin door. When the Test Button is pressed or DIP Switch 1 is flipped on SW1 to the "OFF" position, the screen displays the MAIN SERVICE MENU.

NOTE:

If you used DIP switch 1 to enter the MAIN SERVICE MENU, you will need to flip DIP switch 1 back to the ON position in order to return to the game.



MAIN SERVICE MENU

The main service menu allows you to enter into three different areas:

VOLUME SETTINGS is used to adjust the volume of your game for your location.

OPERATOR ADJUSTABLES is used for customizing your game for your location. Some of the features in operator adjustables are number of coins per game, sounds on or off when no one is playing, difficulty settings, etc.

GAME AUDITS allows you to check your game's overall earnings, game times, game scores, etc. The audits can be reset through this menu as well.

SYSTEM TESTS verifies the operation of the hardware, controls, and monitor through easy and automatic procedures accessed through these menus.

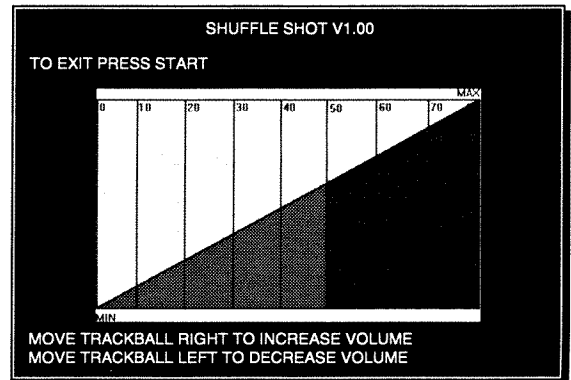
To exit any of these tests and return the game to its normal state, use the trackball to highlight the line that says exit and press the start button.

COLOR KEY NOTE:

For easy identification, all test screens have been color coded. Items displayed in GREEN are the Menu titles. This is the name of the menu that is currently displayed. Items appearing in YELLOW are the menu's instructions. The BLUE items are choices available in this menu. The WHITE item is the selection that is currently highlighted. If RED is ever displayed, there is a problem with that item and it should be corrected.

Volume Settings

The Volume Settings screen is used to adjust the sounds that are heard during game play.

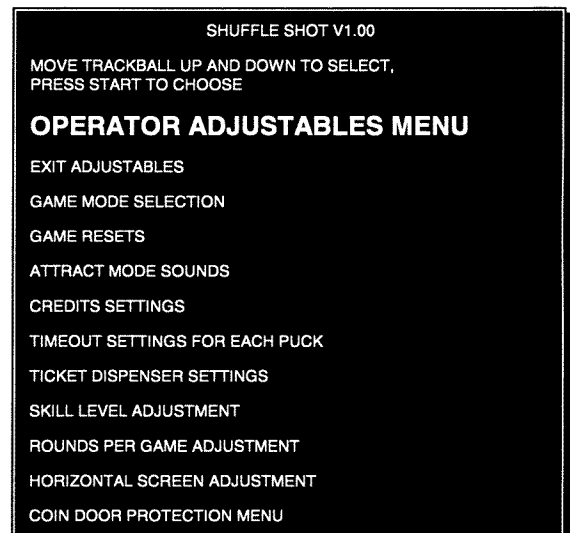


VOLUME SETTINGS SCREEN

When this screen appears, music will play. Move the trackball to the right to increase the game's sounds and music. Rolling the trackball to the left will make the game sounds softer. When you have adjusted the sounds to the appropriate volume, press the START button to exit back to the main menu.

Operator Adjustables Menu

The operator adjustables menu is accessed through the main service menu. From the main service menu, move the trackball down to highlight the words operator adjustables menu which will then appear in white letters. Now press the start button, and the operator adjustables menu will appear on the screen.

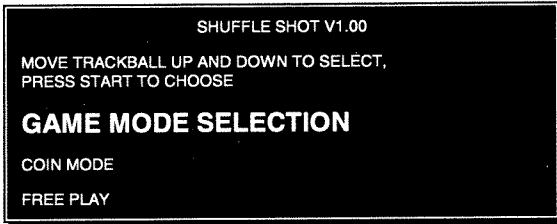


OPERATOR ADJUSTABLES MENU

As you can see, there are many possible customizing procedures that you can control. Below is a brief description of each adjustable function and what the screen looks like when displayed. Remember, to select an item from any menu, using the trackball to highlight the item in white, and then press the start button.

Game Mode Selection

This menu allows you to place the game in standard coin mode, or choose free play.



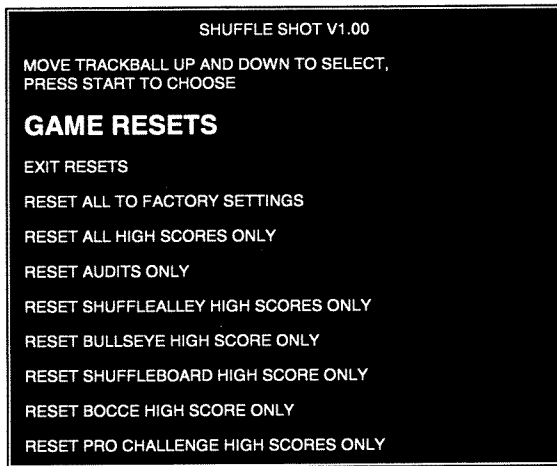
GAME MODE SELECTION SCREEN

In **COIN MODE**, the game will only work if coins are deposited into the game.

In **FREE PLAY**, coins are not needed for play, and the start button is always active.

Game Resets

The Game Resets menu will cancel or zero out any custom features or bookkeeping figures that are no longer wanted.



GAME RESETS MENU

You may want to run local tournaments or league play on SHUFFLE SHOT. The game resets allow you to clear scores from individual leaderboards, so your tournament or league play can begin with no entries. All of the high score screens in SHUFFLE SHOT are for single player games only.

RESET ALL TO FACTORY SETTINGS will change the game back to the way the game was preset when new. Any custom features such as Free Play and Skill Levels will be changed back to the original settings set at the factory.

RESET HIGH SCORES ONLY is used to erase all of the high scores stored in memory.

RESET AUDITS ONLY is used when all of your bookkeeping and statistics have been gathered from the Audits section, and are no longer needed. If you like to gather all of your accounting information each week, or after each collection, it is a good practice to reset all of the audits so your coin count will match the audit information.

RESET SHUFFLEALLEY HIGH SCORES ONLY resets only the one-player high score table for the ShuffleAlley game.

RESET BULLSEYE HIGH SCORES ONLY resets only the one-player high score table for the Bullseye game.

RESET SHUFFLEBOARD HIGH SCORES ONLY resets only the one-player high score table for the ShuffleBoard game.

RESET BOCCE HIGH SCORES ONLY resets only the one-player high score table for the Bocce game.

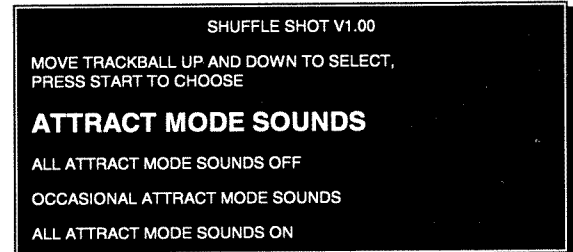
RESET PRO CHALLENGE HIGH SCORES ONLY resets only the one-player high score table for the Pro Challenge game.

NOTE:

The high score screens can be viewed during the attract mode of the game. Pressing and holding the Zoom button displays one of the high score screens, and will stay up until the button is released. Pressing and holding the button again displays the next high score screen. All of the high score screens are available using this feature, which makes determining winners and game leaders accessible without going into Test mode.

Attract Mode Sounds

This menu is used to adjust the sounds that are heard while no one is playing the game.



ATTRACT MODE SOUNDS MENU

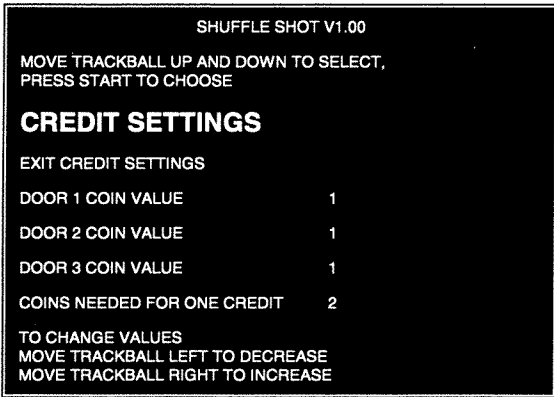
ALL ATTRACT MODE SOUNDS OFF will not allow any sounds to be played during the attract mode.

OCCASIONAL ATTRACT MODE SOUNDS plays sounds about every ten to twelve times the attract mode is repeated.

ALL ATTRACT MODE SOUNDS ON will play sounds during every attract cycle.

Credit Settings

This menu allows you to change the number of coins needed to play SHUFFLE SHOT.



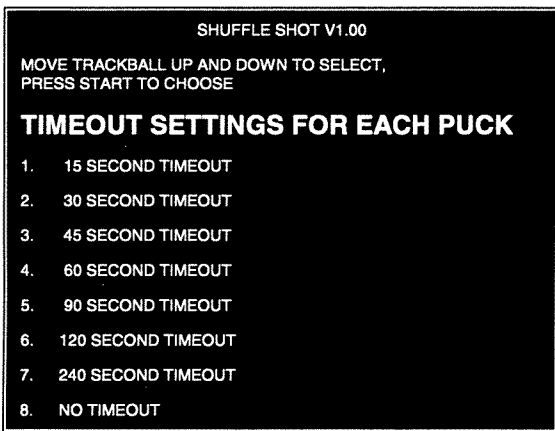
CREDIT SETTINGS SCREEN

You can set each door to different coins values by highlighting: **DOOR 1 COIN VALUE** for coin door 1, **DOOR 2 COIN VALUE** for coin door 2 or **DOOR 3 COIN VALUE** for coin door 3. Moving the trackball left or right will change the number of credits that each coin represents.

COINS NEEDED FOR ONE CREDIT... To award a game credit, the player will need to insert an adjustable number of coins.

Timeout Settings For Each Puck

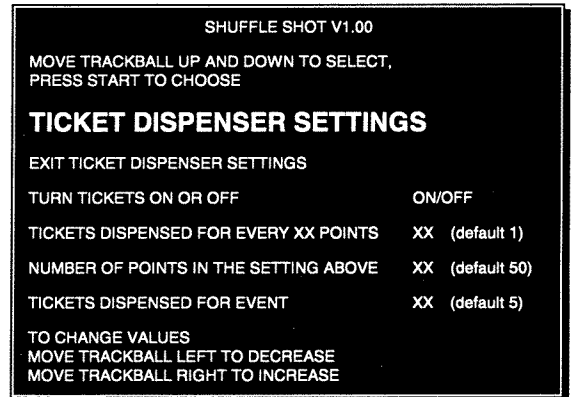
This option allows for changing the time a player has to throw his next puck before a foul is called.



TIMEOUT SETTINGS FOR EACH PUCK SCREEN

Highlight the desired time and press the start button to choose and exit. Default setting is 45.

Ticket Dispenser Settings



TICKET DISPENSER SETTINGS

SHUFFLE SHOT is capable of dispensing tickets through a standard ticket dispenser.

To turn this feature ON or OFF, highlight **TURN TICKETS ON** or **OFF** by rolling the trackball up and down. Rolling the trackball left and right will change the ON and OFF settings.

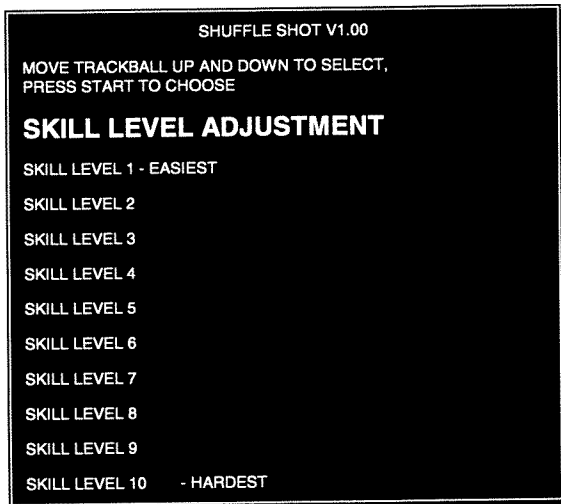
To adjust the number of tickets dispensed, highlight **TICKETS DISPENSED FOR EVERY XX POINTS**. Roll the trackball left or right to adjust the number of tickets appropriate for your location.

The Default point value for dispensing a ticket is 50 points. To change this value, highlight **NUMBER OF POINTS IN THE SETTING ABOVE** and move the trackball left or right to increase or decrease the point value.

You can also give tickets for a game event, such as a *hanger* in Shuffle Alley, a *bullseye* in Bullseye, a *ringer* in Bocce and a *10* in Shuffle Board. Change the ticket value for these events by highlighting **TICKETS DISPENSED FOR EVENT** and moving the trackball left or right to increase or decrease the number of tickets.

Skill Level Adjustment

SHUFFLE SHOT allows for changing the level of skill needed to play the game. This feature is good for locations with younger or novice players who are less skilled at the game, or expert or accomplished players who demand a greater challenge.



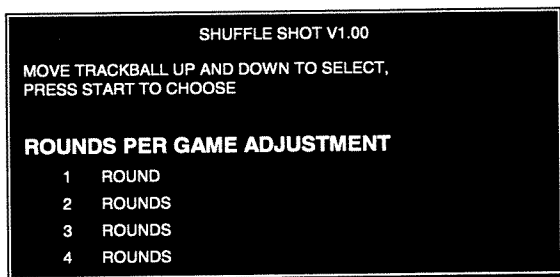
SKILL LEVEL ADJUSTMENT SCREEN

To set the game to an easy skill level, highlight... **SKILL LEVEL 1 - Easiest**.

To set the game to a difficult skill level, highlight... **SKILL LEVEL 10 - Hardest**.

SKILL LEVEL 2 through **SKILL LEVEL 9** are settings between the easiest and hardest levels. Sometimes it is best if the skill level is adjusted gradually over a period of time.

Rounds Per Game Adjustment

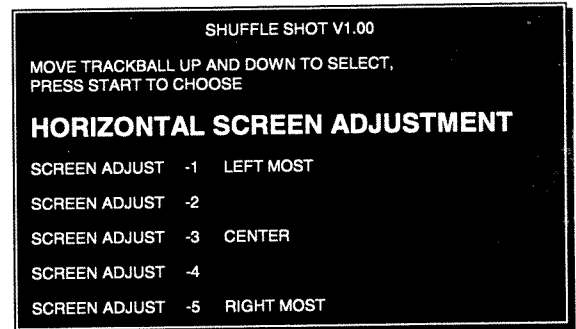


ROUNDS PER GAME ADJUSTMENT

SHUFFLE SHOT has a default setting of 3 rounds per credit. Use this menu to adjust the number of rounds per credit. For 1 round per credit select **1 ROUND**. For 2 rounds per credit, select **2 ROUNDS**. For 3 rounds per credit, select **3 ROUNDS**. For 4 rounds per credit, select **4 ROUNDS**.

Horizontal Screen Adjustments

If the picture on your cabinet is not centered properly, you may be able to adjust it from this menu.



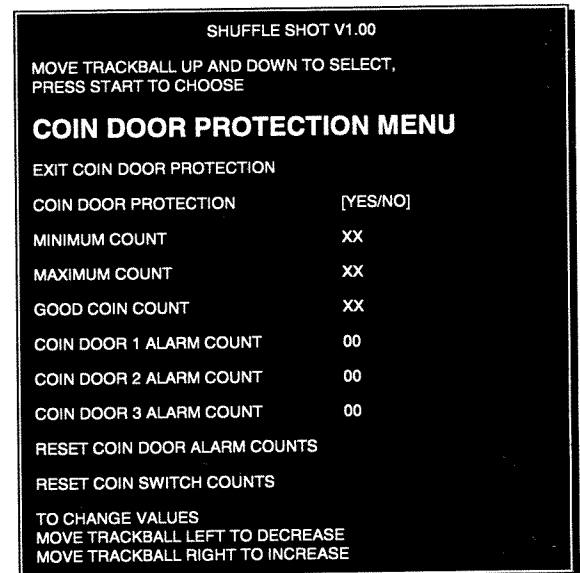
HORIZONTAL SCREEN ADJUSTMENT

SCREEN ADJUST -1 left most will move the picture far to the left.

SCREEN ADJUST -3 center will attempt to center the picture on the video monitor.

SCREEN ADJUST -5 right most will move the picture far to the right.

Coin Door Protection



COIN DOOR PROTECTION MENU

COIN DOOR PROTECTION is implemented by monitoring the coin switch pulse width. A pulse longer than the **MAXIMUM COUNT** sets the game alarm counter. Each count represents about 4 milliseconds.

If two game alarms occur then the game halts and displays a coin failure message. Any unused credits in the game are cleared.

A count of good coin drops is kept and each time the **GOOD COIN COUNT** is reached the game alarm counter is cleared. This allows an occasional coin switch glitch to be tolerated.

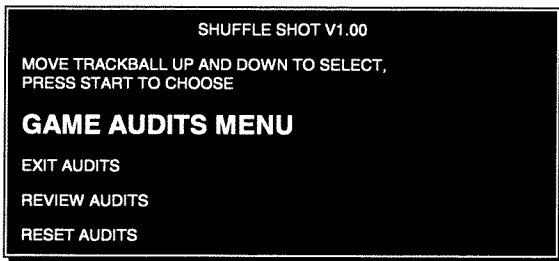
A count of all switch alarms for each coin door is also kept. These counters can be cleared by selecting **RESET COIN DOOR ALARM COUNTS** and **RESET COIN SWITCH COUNTS**

NOTE:

Coin mechanisms and bill acceptors vary widely. Test your game thoroughly with the coin protection ON to make sure the software is compatible with your hardware.

Game Audits Menu

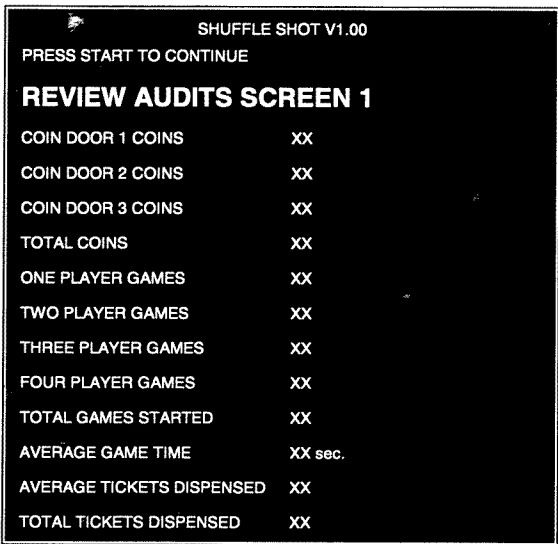
The Game Audits Menu will supply you with a detailed accounting of helpful and informative bookkeeping and statistics. To enter the game audits menu, first go to the main service menu by pressing the test switch located just inside the coin door of the cabinet or flip DIP switch 1 to the 'OFF' position on the Main PCB. From the main service menu, use the trackball to highlight the game audits menu. Now press the start button, and the game audits menu will appear on the screen.



GAME AUDITS SCREEN

Review Audits

When you choose to review the coin audits, the review audits screen will appear.



REVIEW AUDITS 1 SCREEN

COIN DOOR 1 CREDITS and **COIN DOOR 2 CREDITS** show the total coins that have passed through the individual coin mechs.

TOTAL COINS shows the total amount of coins entered into the game.

ONE PLAYER GAMES, TWO PLAYER GAMES, THREE PLAYER GAMES, and **FOUR PLAYER GAMES** display the number and type of games played.

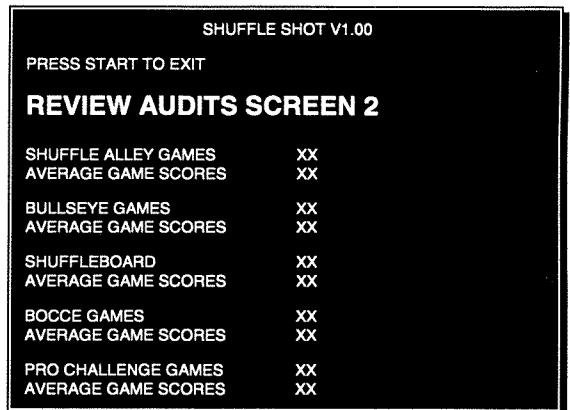
TOTAL GAMES STARTED shows the total number of games started.

AVERAGE GAME SCORE is calculated by totaling all of the final game scores and dividing by the number of games started.

AVERAGE GAME TIME shows the average time it takes to complete a single game.

AVERAGE TICKETS DISPENSED shows the average number of tickets given out during game play.

TOTAL TICKETS DISPENSED displays the actual number of tickets given out.



REVIEW AUDITS 2 SCREEN

SHUFFLEALLEY GAMES shows the total number of ShuffleAlley games played.

AVERAGE GAME SCORES shows the average score over all ShuffleAlley games.

BULLSEYE GAMES shows the total number of Bullseye games played.

AVERAGE GAME SCORES shows the average score over all Bullseye games.

SHUFFLEBOARD GAMES shows the total number of ShuffleBoard games played.

AVERAGE GAME SCORES shows the average score over all ShuffleBoard games.

BOCCE GAMES shows the total number of Bocce games played.

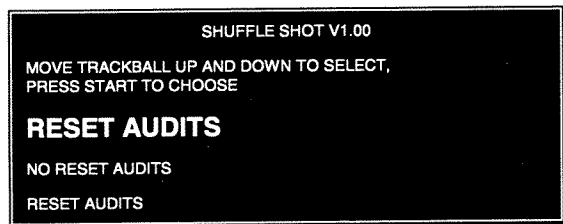
AVERAGE GAME SCORES shows the average score over all Bocce games.

PRO CHALLENGE GAMES shows the total number of Pro Challenge games played.

AVERAGE GAME SCORES shows the average score over all Pro Challenge games.

Reset Audits

This menu will reset your audits.



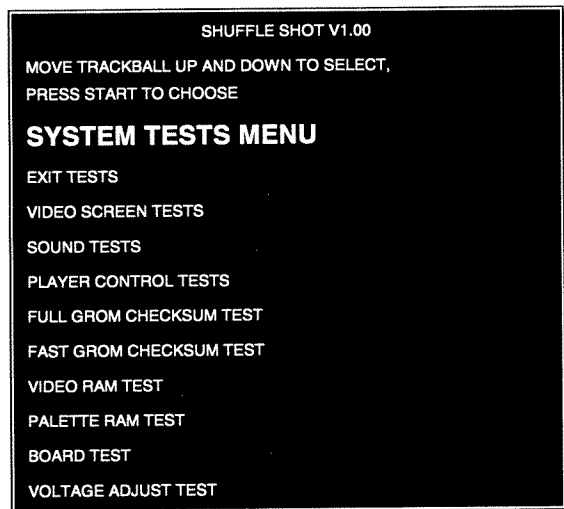
GAME RESETS SCREEN

If you wish to set all of the game audits (described above) back to zero, highlight **RESET AUDITS** from this menu and press the start button. The screen will briefly display audit reset.

If you change your mind and decide not to reset the audits to zero, highlight **NO RESET AUDITS** and you will exit this screen without making any changes.

System Tests Menu

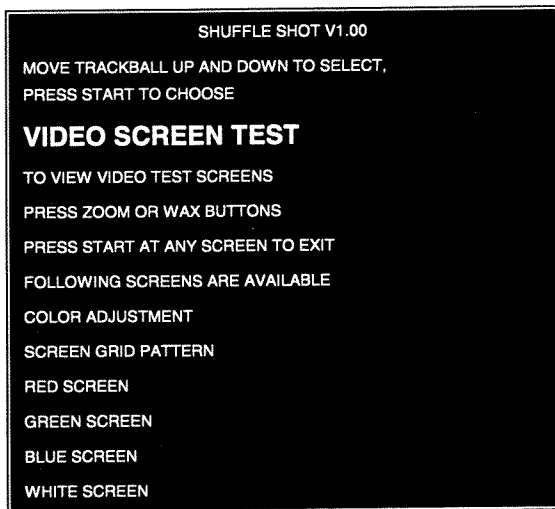
SHUFFLE SHOT has been inspected and tested at the factory, and most likely the game will be in perfect working order when you plug it in. If you are experiencing any problems with the game, the **SYSTEM TESTS MENU** is a good place to start when tracking down the problem. To enter the System Tests Menu, first go to the Main Service Menu by pressing the test switch located just inside the coin door of the cabinet, or set DIP Switch 1 on the Main PCB to the 'OFF' position. From the Main Service Menu, move the trackball until the word **SYSTEM TESTS MENU** appears in white letters. Now press the start button, and the System Tests Menu will appear on the screen.



SYSTEM TESTS MENU

Video Screen Test

You can test your monitor and adjust colors by choosing **VIDEO SCREEN TEST** and pressing the start button.

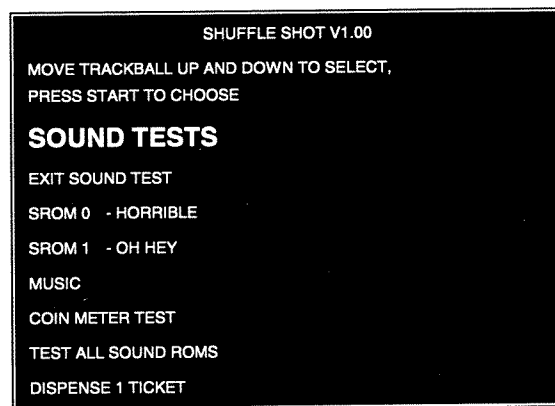


VIDEO SCREEN TEST MENU

When the **ZOOM** or **WAX** buttons are pressed, the screen changes to display a grid of colored rectangles. Use these colors as a guide and adjust your monitor so they look as good as possible. This test can be exited at any time by pressing the start button.

Sound Tests

Choose **SOUND TEST** from the system test menu to test the sounds and speakers in the game. The sound section also controls the coin meter, and you can test it from this section as well.



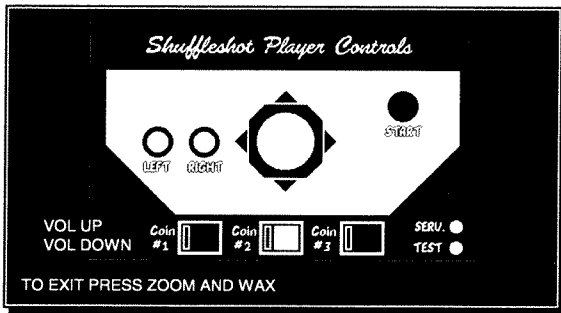
SOUND TESTS SCREEN

To test the coin meter, choose **COIN METER TEST** from this menu. If everything is working properly, the meter should increment each time the start button is pressed while this line is highlighted.

To test the ticket dispenser, highlight **DISPENSE 1 TICKET** from this menu. A ticket should be dispensed when the start button is pressed.

Player Control Test

When **PLAYER CONTROL TEST** is selected, the screen will display a diagram of a typical **SHUFFLE SHOT** control panel. The controls are highlighted on the diagram when the controls are active. Test all of the controls, including coin test and service switches. Press zoom and wax together to exit this test.



PLAYER CONTROL TEST SCREEN

Fast GROM Checksum Test

Choose **FAST GROM Checksum Test** from the system test menu to test the Graphics chips on the PCB. This test performs a complete test of the Graphics ROM's. While the test is in progress the following message is displayed:

FAST GROM CHECKSUM TEST - 20 SECONDS TO FINISH

FAST GROM CHECKSUM TEST SCREEN
(Test In Progress)

When the test is completed the GROM Test Screen is displayed.

SHUFFLE SHOT V1.00

FAST GROM CHECKSUM TEST

GROM	CHECKSUM	STAT	GROM	CHECKSUM	STAT
GRMA_0	XXXXXX	GOOD	GRMB_0	XXXXXX	GOOD
GRMA_1	XXXXXX	GOOD	GRMB_1	XXXXXX	GOOD
GRMA_2	XXXXXX	GOOD	GRMB_2	XXXXXX	GOOD
GRMA_3	XXXXXX	GOOD	GRMB_3	XXXXXX	GOOD
GRMC_0	XXXXXX	GOOD	GRMD_0	XXXXXX	GOOD
GRMC_1	XXXXXX	GOOD	GRMD_1	XXXXXX	GOOD
GRMC_2	XXXXXX	GOOD	GRMD_2	XXXXXX	GOOD
GRMC_3	XXXXXX	GOOD	GRMD_3	XXXXXX	GOOD
PROM0	XXXXXX	GOOD			
PROM1	XXXXXX	GOOD			
PROM2	XXXXXX	GOOD			
PROM3	XXXXXX	GOOD			

FAST GROM CHECKSUM TEST: (PASSED or FAILED)

PRESS START BUTTON TO EXIT

FAST GROM CHECKSUM TEST SCREEN
(Test Completed)

If all checksums are shown in blue, the test passed and your game is in good working order.

If any checksums are bad, they will be displayed in red text on this screen. This means that the GROM is defective and needs to be replaced. Call your distributor or Incredible Technologies, Service Department for further help.

To exit this test, press the start button.

Full GROM Checksum Test

Choose **FULL GROM CHECKSUM TEST** from the system test menu to test the Graphics chips on the PCB. This test performs a complete test of the Graphics ROM's. While the test is in progress the following message is displayed:

FULL GROM CHECKSUM TEST - 20 SECONDS TO FINISH

FULL GROM CHECKSUM TEST SCREEN
(Test In Progress)

When the test is completed the GROM Test Screen is displayed.

SHUFFLE SHOT V1.00

FULL GROM CHECKSUM TEST

GROM	CHECKSUM	STAT	GROM	CHECKSUM	STAT
GRMA_0	XXXXXX	GOOD	GRMB_0	XXXXXX	GOOD
GRMA_1	XXXXXX	GOOD	GRMB_1	XXXXXX	GOOD
GRMA_2	XXXXXX	GOOD	GRMB_2	XXXXXX	GOOD
GRMA_3	XXXXXX	GOOD	GRMB_3	XXXXXX	GOOD
GRMC_0	XXXXXX	GOOD	GRMD_0	XXXXXX	GOOD
GRMC_1	XXXXXX	GOOD	GRMD_1	XXXXXX	GOOD
GRMC_2	XXXXXX	GOOD	GRMD_2	XXXXXX	GOOD
GRMC_3	XXXXXX	GOOD	GRMD_3	XXXXXX	GOOD
PROM0	XXXXXX	GOOD			
PROM1	XXXXXX	GOOD			
PROM2	XXXXXX	GOOD			
PROM3	XXXXXX	GOOD			

FULL GROM CHECKSUM TEST: (PASSED or FAILED)

PRESS START BUTTON TO EXIT

FULL GROM CHECKSUM TEST SCREEN
(Test Completed)

If all checksums are shown in blue, the test passed and your game is in good working order.

If any checksums are bad, they will be displayed in red text on this screen. This means that the GROM is defective and needs to be replaced. Call your distributor or Incredible Technologies, Service Department for further help.

To exit this test, press the start button.

Video Ram Test

This test performs a complete test of the Graphics Video RAM. When the test is completed the results will be displayed as follows.

```

SHUFFLE SHOT V1.00

VIDEO RAM TEST

VIDEO PLANE A PAGE 0 STATUS = 0000
VIDEO PLANE A PAGE 1 STATUS = 0000
VIDEO PLANE B PAGE 0 STATUS = 0000
VIDEO PLANE B PAGE 1 STATUS = 0000
VIDEO RAM TEST [PASSED or FAILED]

PRESS START BUTTON TO EXIT
PRESS LEFT BUTTON TO LOOP TEST
    
```

VIDEO RAM TEST SCREEN

1. If the game passes this test, zeros will be displayed in white along with a "video ram test passed" message..
2. If the test fails, a non-zero status and "video ram test failed" message will be displayed in red. Call your distributor or Incredible Technologies, Service Department for further help.
3. To exit this test, press the start button.

Palette Ram Test

```

SHUFFLE SHOT V1.00

PALETTE RAM TEST

PALETTE RAM STATUS = 0000
RED GOOD GREEN GOOD BLUE GOOD

PALETTE STATUS
00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000

PALETTE RAM TEST [PASSED/FAILED]

PRESS START BUTTON TO EXIT
PRESS LEFT BUTTON TO LOOP TEST
    
```

PALETTE RAM TEST MENU

Board Test

```

PROGRAM MEMORY U45-U48 GOOD

PALETTE RAM TEST

RED GOOD GREEN GOOD BLUE GOOD

PALETTE RAM TEST PASSED

VIDEO RAM TEST

U30 GOOD U31 GOOD U32 GOOD U35 GOOD

VIDEO RAM TEST PASSED

GROM CHECKSUM STAT GROM CHECKSUM STAT
GRMA_0 XXXXXX GOOD GRMB_0 XXXXXX GOOD
GRMA_1 XXXXXX GOOD GRMB_1 XXXXXX GOOD
GRMA_2 XXXXXX GOOD GRMB_2 XXXXXX GOOD
GRMA_3 XXXXXX GOOD GRMB_3 XXXXXX GOOD

GRMC_0 XXXXXX GOOD GRMD_0 XXXXXX GOOD
GRMC_1 XXXXXX GOOD GRMD_1 XXXXXX GOOD
GRMC_2 XXXXXX GOOD GRMD_2 XXXXXX GOOD
GRMC_3 XXXXXX GOOD GRMD_3 XXXXXX GOOD

PROM0 XXXXXX GOOD
PROM1 XXXXXX GOOD
PROM2 XXXXXX GOOD
PROM3 XXXXXX GOOD

FAST GROM CHECKSUM TEST PASSED

!!! BOARD TEST PASSED !!!
    
```

BOARD TEST SCREEN

Voltage Adjust Test

When the VOLTAGE ADJUST TEST is selected, the screen will display the history of how the voltage has been and how the current voltage is now. Adjust your voltage until you read voltage is OK.

```

SHUFFLE SHOT V1.00

PRESS START TO EXIT

VOLTAGE HISTORY IS SET TO OK ON EXIT

VOLTAGE ADJUST TEST

HISTORY:

VOLTAGE HAS BEEN OK

RIGHT NOW:

VOLTAGE IS OK
    
```

VOLTAGE ADJUST TEST SCREEN

APPENDIX A

GENERAL TROUBLESHOOTING

IMPORTANT!:

The 5 Volt setting on the power supply *must be* set to 5.2 Volts on the circuit board (I.C.). Use the Voltage Adjust Test screen, on page 16, to help you adjust your power supply. When the test screen reads VOLTAGE OK, your power supply is properly adjusted.

IMPORTANT!:

The supplied trackball comes equipped with a grounding cable. This cable *must be* connected to field ground to protect the trackball P.C. boards from becoming damaged by electro-static discharge.

VIDEO PROBLEMS

<u>Symptom</u>	<u>Probable Cause</u>	<u>Solution</u>
No picture	<p>Check Dip switches.</p> <p>Bad connections</p> <p>Monitor</p> <p>JAMMA harness connected improperly</p>	<p>SW1-Dip switches 1 thru 4, near the JAMMA, must be "ON".</p> <p>SW2-Dip switches 1 and 2, near the green LED, must be "ON", and 3 and 4 must be "OFF".</p> <p>Make sure there are good connections from the board's video outputs to the monitor's video inputs.</p> <p>Make sure the monitor is operating correctly. (Check it with another compatible logic board.)</p> <p>Identify Pin 1 on the JAMMA connector and on the PCB. If installed incorrectly, damage to the PCB may have occurred.</p>
Scrambled Picture	Missing sync connection or misadjusted monitor	Check the sync connection - Adjust monitor
Missing colors or a washed out color	Bad video connections	Check the video red, green, and blue connections.
Bright, blurry, or rolling picture	Misadjusted monitor	Adjust the monitor, not the board. (Refer to your monitor manual.)
Picture too large, too small, or off center	Misadjusted monitor	Adjust the monitor, not the board. (Refer to your monitor manual.)
Video image is flipped	Misadjusted Monitor	Reverse the monitor's convergence wires or flip the monitor 180°. (Refer to your monitor manual.)
Bad images in picture	<p>Bad GROM</p> <p>Short on the GROMs</p>	<p>Do GROM test. Check IC pins to make sure none are bent over.</p> <p>Remove the short.</p>
Diagonal white lines	GND problem	Earth and Logic GND's should be connected at the power supply.

APPENDIX A GENERAL TROUBLESHOOTING

SOUND PROBLEMS

<u>Symptom</u>	<u>Probable Cause</u>	<u>Solution</u>
No Sound	+12v power supply is bad Bad connection to the board JAMMA harness connected improperly Miscellaneous Sounds are turned OFF in Operator Adjustables	Try another +12v power supply. Check for +12v power on the board. Check for +5v power on the board. Check the volume setting in the OPERATORS ADJUSTABLE section of the Operators Mode. Check the speaker connections. Identify Pin 1 on the JAMMA connector and on the PCB. If installed incorrectly, damage to the PCB may have occurred. Make sure the sound status light is flashing on the board. Turn sounds ON in Operator Adjustables.

CONTROL PROBLEMS

<u>Symptom</u>	<u>Probable Cause</u>	<u>Solution</u>
Buttons do not work or are partly inoperable. Or the selections keep scrolling on Operator Mode menus.	Switches not properly connected	Make sure that the common post of the switch is connected to ground. Make sure each individual switch is working by doing the Control Panel Test found in the SYSTEM TESTS section. Make sure that the signal wire for that particular switch is connected to the normally open post of the switch.
Coin counter not working	JAMMA harness connected improperly Miscellaneous	Identify Pin 1 on the JAMMA connector and on the PCB. If installed incorrectly, damage to the PCB may have occurred. Make sure that the signal wire has a connection from the switch to the board. Make sure +12v is hooked up to the counter. The signal wire is not connected to coin counter. (Check continuity). Verify that the counter is good.
Trackball does not work	No +5 voltage	Bad inductor(L7) or bad connection to trackball.

IMPORTANT!:

The supplied trackball comes equipped with a grounding cable. This cable *must be* connected to field ground to protect the trackball P.C. boards from becoming damaged by electro-static discharge.

APPENDIX A

GENERAL TROUBLESHOOTING

POWER-UP PROBLEMS

<u>Symptom</u>	<u>Probable Cause</u>	<u>Solution</u>
No reaction when game is turned on	Voltage to high	<p>Power supply is too high. Power should be between +5v & 5.2v. (Measured on the circuit board).</p> <p>Cabinet is not connected to earth ground. (All metal should be connected to the earth ground).</p> <p>Short between power and ground. Check for foreign material.</p> <p>Disconnect the harness and measure the resistance between power and ground. It should read around 600 ohms. (0 ohms is a dead short).</p> <p>Make sure the harness is not shorting to anything, such as bare or frayed wires shorting out each other or hitting bare metal.</p>
	JAMMA harness connected improperly	Identify Pin 1 on the JAMMA connector and on the PCB. If installed incorrectly, damage to the PCB may have occurred.
	Power supply	Power supply too low. (Should ideally be between +5v & +5.2v). (Measured on the circuit board).
	Short on the board	Check for loose or foreign material on the board.
	No power from the power supply	Replace power supply.
	Screen flashes repeatedly	Open on socketed IC's
+5v setting too low		Make sure that all IC's are seated in their sockets properly.
SW2 Dip switches near the green LED may not be set correctly.		Check voltage. (Measured on the circuit board).
		Make sure SW2-Dip switch #1 and # 2 are "ON", and #3 and #4 are "OFF".

APPENDIX A

GENERAL TROUBLESHOOTING

MISCELLANEOUS PROBLEMS

<u>Symptom</u>	<u>Probable Cause</u>	<u>Solution</u>
Green L.E.D. not blinking	Program not running	Make sure all socketed ICS are seated correctly. Look for bent pins.
	Bad connections	Make sure you have continuity from PCB to power supply.
	Loose pin on ASIC (U1)	Call Incredible Technologies, Inc.
Operator adjustables keep changing	Low battery voltage	Battery should be 2 to 3 volts.
	Bad static RAM (U50)	Replace.
Sounds bad	Miscellaneous	Check the speaker connections.
Game comes up in Test Mode	Dip Switch 1 is "OFF"	Make sure SW1-Dip Switch 1, near the JAMMA, is in the "ON" position.
Screen is frozen with an image on the screen.	Dip Switch 2 is "OFF"	Make sure SW1-Dip Switch 2, near the JAMMA, is in the "ON" position.
Bad images in picture	Bent pin on GROMs	Fix the bent pin.
	Short on the GROMs	Remove the short.

APPENDIX B JAMMA HARNESS CONNECTION

WIRE COLOR	SOLDER SIDE	
Black	GND	A
Black	GND	B
Red	+5 vdc	C
Red	+5 vdc	D
		E
Orange	+12vdc	F
KEY		H
		J
		K
Yellow-Green	Left Speaker (-)	L
		M
Green-Black	Video Green	N
White	Video Sync	P
Orange-Black	Service	R
		S
Green-Blue	Coin2	T
		U
		V
		W
		X
		Y
		Z
		a
Orange Yellow	Volume Down	b
		c
		d
Black	GND	e
Black	GND	f

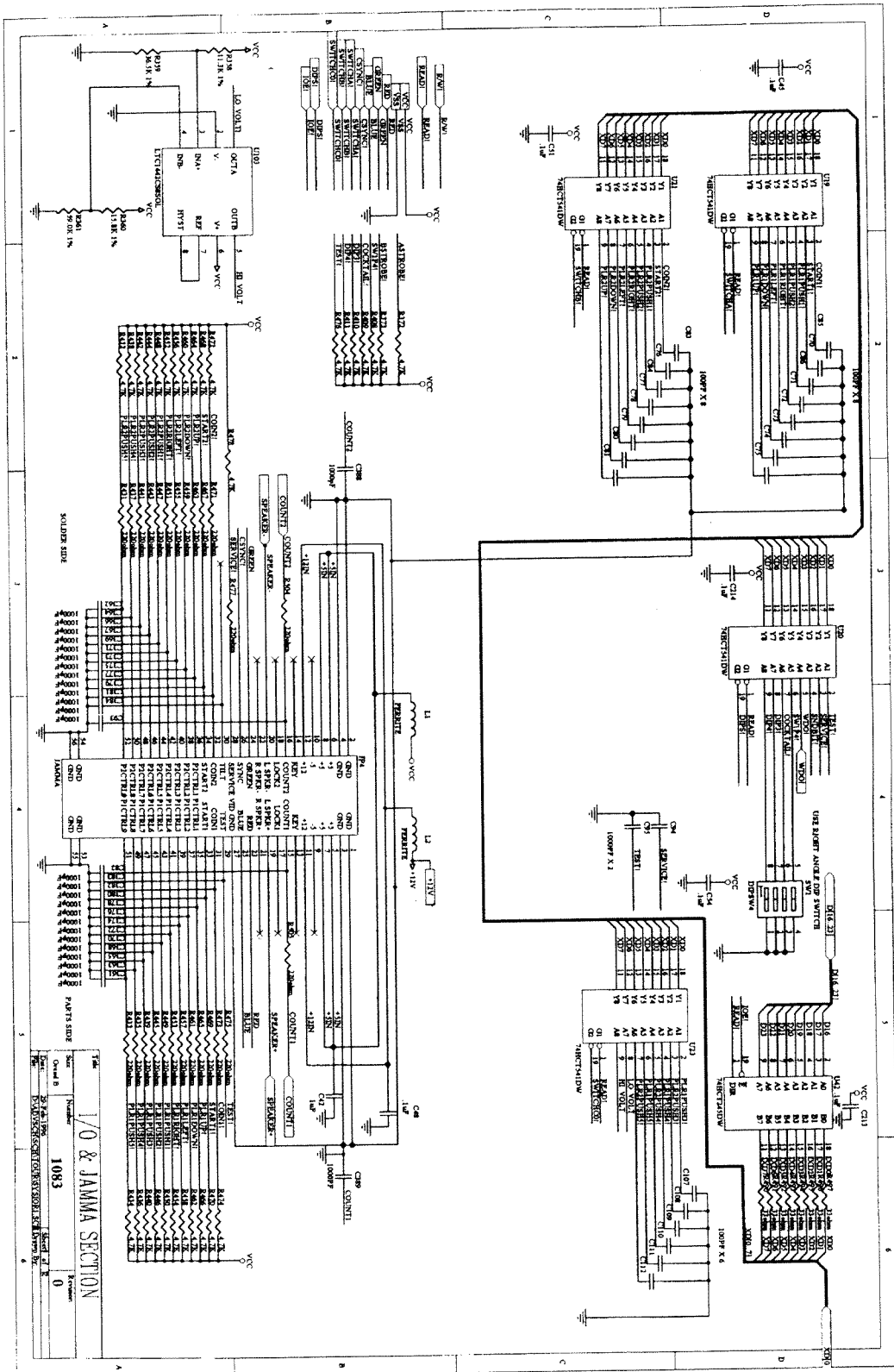
	PARTS SIDE	WIRE COLOR
1	GND	Black
2	GND	Black
3	+5 vdc	Red
4	+5 vdc	Red
5		
6	+12 vdc	Orange
7	KEY	
8	Coin Counter	Red-Green
9		
10	Left Speaker (+)	Yellow-Red
11		
12	Video Red	Red-Black
13	Video Blue	Blue-Black
14	Video GND	White-Black
15	Test	Blue
16	Coin 1	Red-Blue
17	Start 1	Red-White
18		
19		
20		
21		
22	Player - ZOOM	Brown-White
23	Player - WAX	Yellow-White
24	Volume Up	Orange-White
25	Coin 3	Gray-White
26		
27	GND	Black
28	GND	Black

TRACKBALL CABLE CONNECTION

Memory Board		Trackball Connector
PIN WIRE #6 - Black	⇒	PIN WIRE #1 - Black
PIN WIRE #1 - Red	⇒	PIN WIRE #2 - Red
PIN WIRE #2 - Yellow	⇒	PIN WIRE #3 - Yellow
PIN WIRE #3 - Green	⇒	PIN WIRE #4 - Green
PIN WIRE #5 - Blue	⇒	PIN WIRE #5 - Blue
PIN WIRE #4 - Purple	⇒	PIN WIRE #6 - Purple

NOTE: Remember to connect the trackball cable to JP7.

APPENDIX C I/O AND JAMMA SCHEMATIC



APPENDIX D WARRANTY INFORMATION



If the original purchaser discovers any physical defect in the media (disk, EPROM, tape) on which the software is distributed or in the documentation, which in the opinion of Incredible Technologies, Inc. (IT) prevents the product from being used as reasonably intended, IT will replace the media or documentation at no charge. The purchaser must return the item to be replaced, with proof of purchase, to IT within 90 days after taking delivery of the software.

IT warrants to the original purchaser that the hardware product is in good working condition for a period of 90 days from taking delivery of the product. Should this product, in IT's opinion, malfunction within the warranty period because of a defect in design, materials, or workmanship, IT will repair or replace this product without charge under the terms as follows. Replacement of either the hardware product or its component parts will be only on an exchange basis. Any replaced parts or components become the property of IT. 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.

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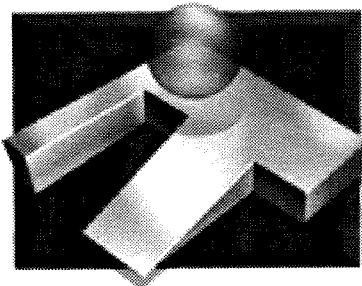
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