INSTALLATION MANUAL

it

incredible
TECHNOLOGIES

World Class Bowling Deluxe

World Class Bowling Deluxe offers players their choice of two exciting Bowling games! The first is Regulation Bowling and the second is the exciting new Flash Bowling!

How to Play Flash Bowling

Bonus values appear at the top of the screen. The numbers light up in sequence.

The flashing numbers stop when the ball hits a pin.

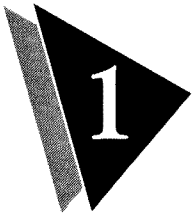On a strike, the value of the highlighted number is added to the player's score.

On a spare, half the value of the highlighted number is added to the player's score.

To view the bonus values from previous frames, press the start button.

Flash Bowling offers a new element of skill and timing to the game of Bowling, as players try to stop the moving number values as they go for strikes and spares. Try it today!

Table of Contents

GETTING STARTED

GAME PACKAGE CONTENTS

(1) Printed Circuit Board (PCB) Assembly
(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", ¼", and 7/16" Bits
1-3/16" 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
3-1/2" 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
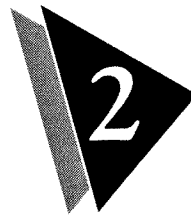
INSTALLATION PREPARATION

BEFORE YOU START.....

1. Check to see if all the needed parts have been included in your kit (See **GAME PACKAGE CONTENTS.**)

2. Do you have the necessary tools? (See **RECOMMENDED TOOLS AND SUPPLIES.**)

3. 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 WORLD CLASS BOWLING.

+5 VDC	5 amps
+12 VDC	2 amps
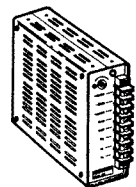
WARNING!!!

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 WORLD CLASS BOWLING. 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

WORLD CLASS BOWLING requires a low-res 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
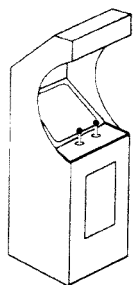
You can choose either a new cabinet or a used cabinet for your WORLD CLASS BOWLING game. Reusing a cabinet is by far the most cost-effective way to maximize the return of your initial investment. In either case, all you need to provide is the cabinet with a power supply and monitor. We provide the rest. 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 WORLD CLASS BOWLING.

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 WORLD CLASS BOWLING

1. Remove the following from the cabinet:

   • Main Logic Board(s)
   • Control Panel
   • Monitor Plexiglas
   • Marquee
   • Cabinet Graphics

2. Thoroughly clean out your cabinet. Remove all the old buttons, joysticks and wires from the control panel. **DO NOT** remove monitor and speaker wires.

3. Remove the old graphics and adhesive from the control panel, and the side of the cabinet. Remove adhesive with solvent.

4. 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.

5. 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.

6. 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.
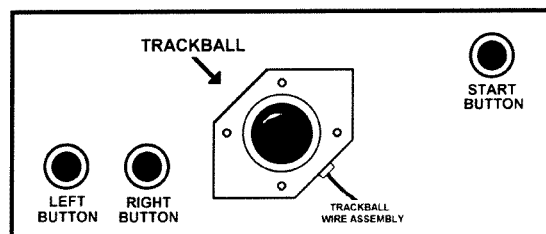
CONTROL PANEL LAYOUT
(TRACKBALL MUST BE CENTERED ON THE CONTROL PANEL)

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

MONITOR

Metal Mounting Plate

3/16" Mounting Holes

Trackball Assembly

3" Trackball Hole

3/16" Mounting Holes

Trackball Wires
Must Be Onerted
To This Position

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!:

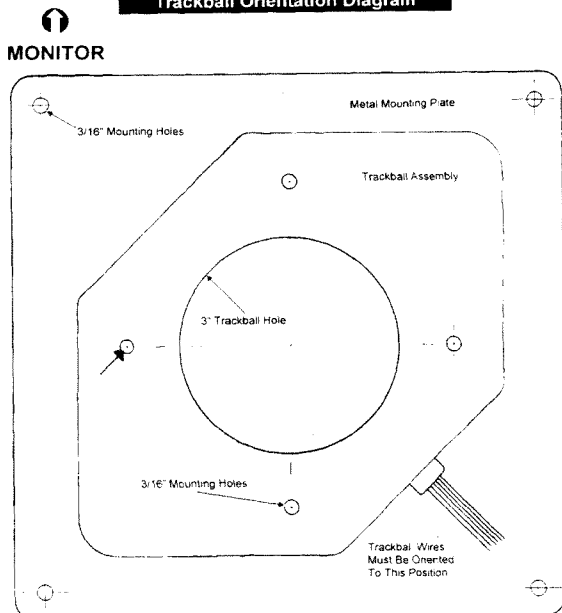The supplied trackball comes equipped with a grounding cable. This cable **must be** connected to field ground to protect the trackball P.C. boards from becoming damaged by electro-static discharge.

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.

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" Rabbiting 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.

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.
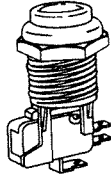
THE GRAPHICS OVERLAY

WORLD CLASS BOWLING 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. Refer to the diagram below.
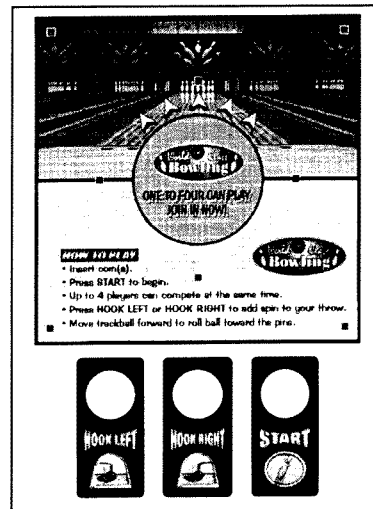
FUNCTION LABELS (SUPPLIED)
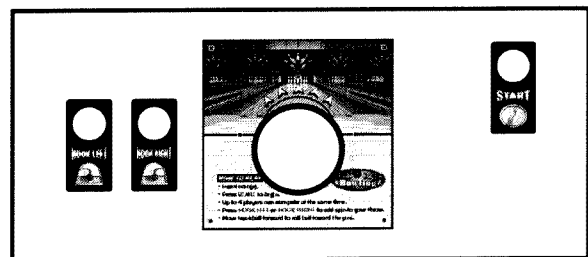
FUNCTION LABELS LAYOUT

MARQUEE INSTALLATION

Using the marquee glass as a template, center the it 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.

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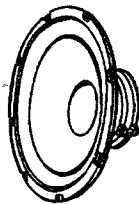 reproduction of good game sounds. Remember, this is not just a video game -- it is a video/audio game investment. Far more effort was put into the sounds of this game than is put into most other arcade games. If the speakers are not up to it, replace them. A small investment in good speakers can make 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.
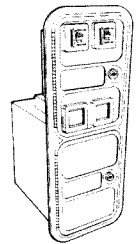
TICKET DISPENSER INSTALLATION

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.

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 is 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 or is it too bright or too Is it in focus? Adjust your monitor to get the best picture possible.
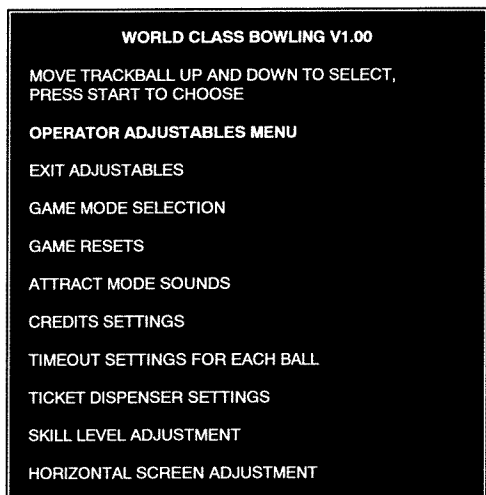
> ## NOTE:
> Check your monitor manual to make adjustments. Some test patterns are available through the game's system tests by pressing the Test switch. Use them when making any adjustments. (See SYSTEM TESTS information on page 14. Proper monitor adjustment is very important.)

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.

OPERATOR ADJUSTABLES

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.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

OPERATOR ADJUSTABLES MENU

EXIT ADJUSTABLES

GAME MODE SELECTION

GAME RESETS

ATTRACT MODE SOUNDS

CREDITS SETTINGS

TIMEOUT SETTINGS FOR EACH BALL

TICKET DISPENSER SETTINGS

SKILL LEVEL ADJUSTMENT

HORIZONTAL SCREEN ADJUSTMENT
```

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**.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

GAME MODE SELECTION

COIN MODE

FREE PLAY
```
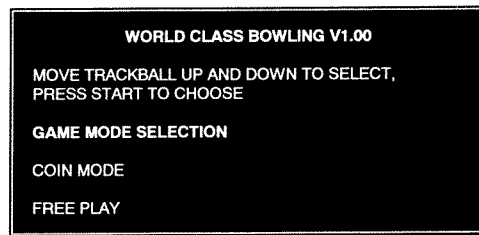
GAME MODE SELECTION SCREEN

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.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

GAME RESETS

EXIT RESETS

RESET ALL TO FACTORY SETTINGS

RESET HIGH SCORES ONLY

RESET AUDITS ONLY
```
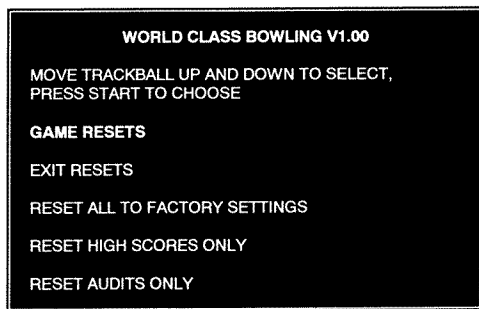
GAME RESETS MENU

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.

ATTRACT MODE SOUNDS

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

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

ATTRACT MODE SOUNDS

ALL ATTRACT MODE SOUNDS OFF

OCCASIONAL ATTRACT MODE SOUNDS

ALL ATTRACT MODE SOUNDS ON
```
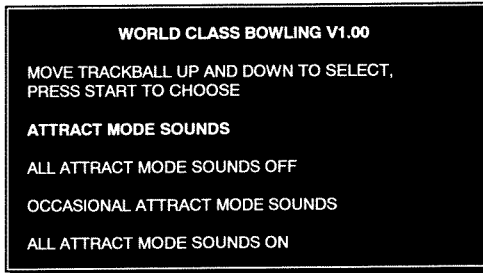
ATTRACT MODE SOUNDS MENU

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 WORLD CLASS BOWLING.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

CREDIT SETTINGS

EXIT CREDIT SETTINGS

DOOR 1 CREDITS PER COIN              1

DOOR 2 CREDITS PER COIN              1

COINS NEEDED TO START               2

TO CHANGE VALUES
MOVE TRACKBALL LEFT TO DECREASE
MOVE TRACKBALL RIGHT TO INCREASE
```

CREDIT SETTINGS SCREEN

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

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

TIMEOUT SETTINGS FOR EACH BALL

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

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

TIMEOUT SETTINGS FOR EACH BALL

1.        15        SECOND TIMEOUT
2.        30        SECOND TIMEOUT
3.        45        SECOND TIMEOUT
4.        60        SECOND TIMEOUT
5.        90        SECOND TIMEOUT
6.        120       SECOND TIMEOUT
7.        240       SECOND TIMEOUT
8.        NO TIMEOUT
```
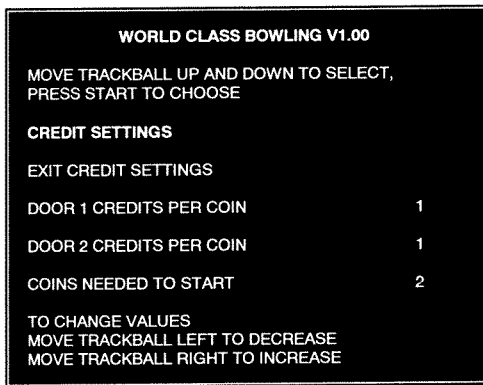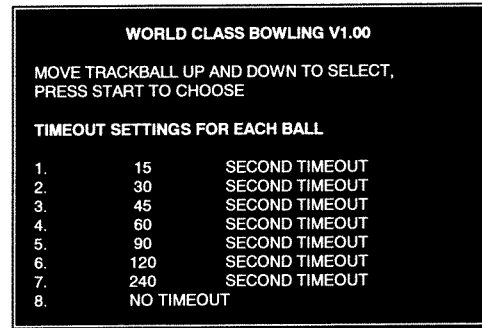
TIMEOUT SETTINGS FOR EACH BALL SCREEN

Highlight the desired time and press the **START** button to choose and exit.

TICKET DISPENSER SETTINGS

```
WORLD CLASS BOWLING V1.00

TICKET DISPENSER SETTINGS

EXIT TICKET SETTINGS

TURN TICKETS ON OR OFF
               ON/OFF

TICKETS DISPENSED FOR EVERY 60 POINTS    4

TICKETS FOR BEER FRAME STRIKE            3

TICKETS FOR PERFECT GAME
               10

TO CHANGE VALUES
MOVE TRACKBALL LEFT TO DECREASE
MOVE TRACKBALL RIGHT TO INCREASE
```
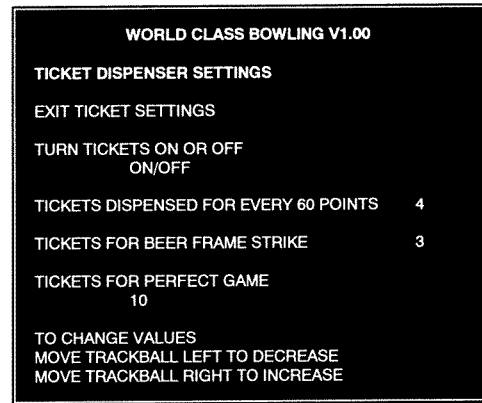
TICKET DISPENSER SETTINGS

WORLD CLASS BOWLING 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 60 POINTS**. Roll the trackball left or right to adjust the number of tickets appropriate for your location.

You can reward tickets for special events in the game. **TICKETS FOR BEER FRAME STRIKE** will dispense the desired number of tickets in frame 5 of each game if a player strikes.

TICKETS FOR PERFECT GAME dispense the desired number of tickets to a player who makes all strikes. To turn these features off, set the number to zero.

SKILL LEVEL ADJUSTMENT

WORLD CLASS BOWLING 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.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

SKILL LEVEL ADJUSTMENT

SKILL LEVEL 1              - EASIEST
SKILL LEVEL 2
SKILL LEVEL 3
SKILL LEVEL 4
SKILL LEVEL 5              - HARDEST
```
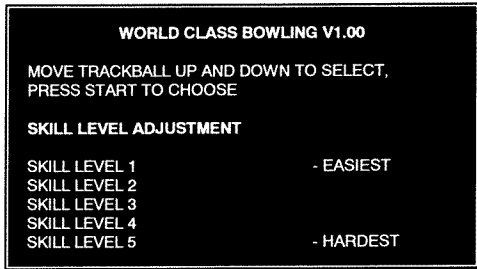
SKILL LEVEL ADJUSTMENT SCREEN

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 5 - HARDEST.

SKILL LEVEL 2, SKILL LEVEL 3, SKILL LEVEL 4 are settings between the easiest and hardest levels. Sometimes it is best if the skill level is adjusted gradually over a period of time.

HORIZONTAL SCREEN ADJUSTMENTS

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

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

HORIZONTAL SCREEN ADJUSTMENT

SCREEN ADJUST      -1        LEFT MOST

SCREEN ADJUST      -2

SCREEN ADJUST      -3        CENTER

SCREEN ADJUST      -4

SCREEN ADJUST      -5        RIGHT MOST
```
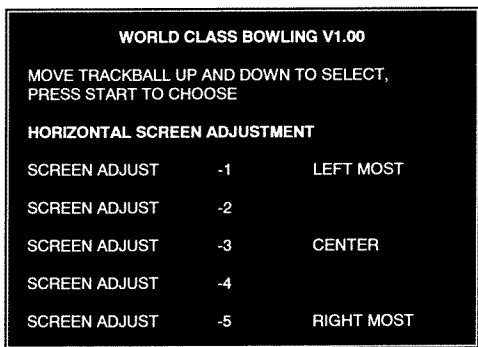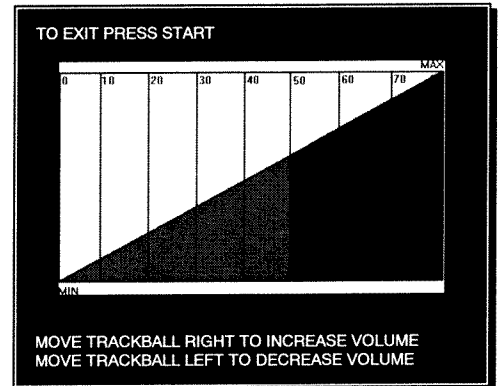
HORIZONTAL SCREEN ADJUSTMENT

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.

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.

GAME AUDITS

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.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

GAME AUDITS MENU

EXIT AUDITS

REVIEW AUDITS

RESET AUDITS
```
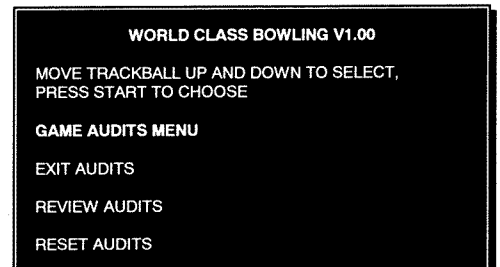
GAME AUDITS SCREEN

REVIEW AUDITS

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

```
WORLD CLASS BOWLING V1.00

PRESS START TO EXIT

REVIEW AUDITS SCREEN

COIN DOOR 1 COINS            XX

COIN DOOR 2 COINS            XX

TOTAL COINS                  XX

ONE PLAYER GAMES             XX

TWO PLAYER GAMES             XX

THREE PLAYER GAMES           XX

FOUR PLAYER GAMES            XX

TOTAL GAMES STARTED          XX

AVERAGE GAME SCORE XX

AVERAGE GAME TIME            XX sec.

AVERAGE TICKETS DISPENSED    XX

TOTAL TICKETS DISPENSED      XX
```

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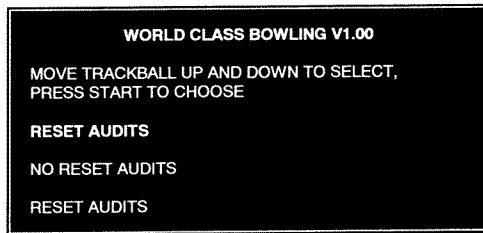
AVERAGE GAME TIME shows the average time it takes to complete a single game.

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.

RESET AUDITS

This menu will reset your audits.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

RESET AUDITS

NO RESET AUDITS

RESET AUDITS
```
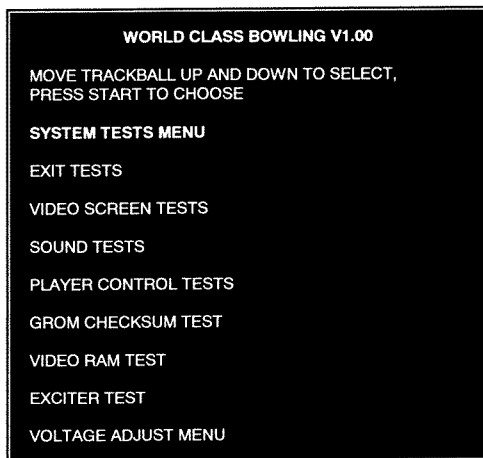
GAME RESETS SCREEN

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

WORLD CLASS BOWLING 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.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

SYSTEM TESTS MENU

EXIT TESTS

VIDEO SCREEN TESTS

SOUND TESTS

PLAYER CONTROL TESTS

GROM CHECKSUM TEST

VIDEO RAM TEST

EXCITER TEST

VOLTAGE ADJUST MENU
```
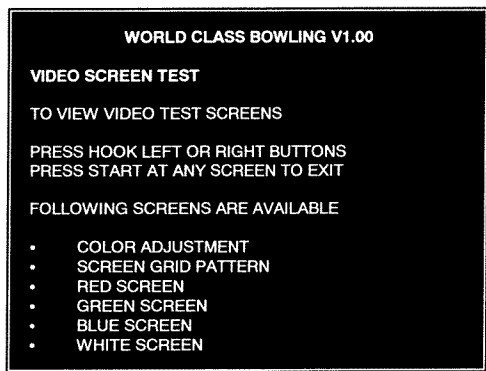
SYSTEM TESTS MENU

VIDEO SCREEN TEST

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

```
WORLD CLASS BOWLING V1.00

VIDEO SCREEN TEST

TO VIEW VIDEO TEST SCREENS

PRESS HOOK LEFT OR RIGHT BUTTONS
PRESS START AT ANY SCREEN TO EXIT

FOLLOWING SCREENS ARE AVAILABLE

    •      COLOR ADJUSTMENT
    •      SCREEN GRID PATTERN
    •      RED SCREEN
    •      GREEN SCREEN
    •      BLUE SCREEN
    •      WHITE SCREEN
```
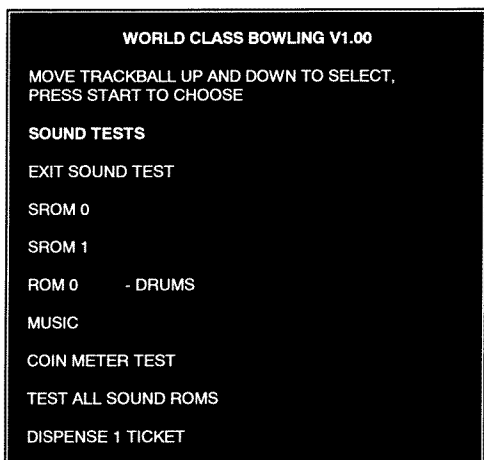
VIDEO SCREEN TEST MENU

When the **HOOK LEFT** or **HOOK RIGHT** 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.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

SOUND TESTS

EXIT SOUND TEST

SROM 0

SROM 1

ROM 0      - DRUMS

MUSIC

COIN METER TEST

TEST ALL SOUND ROMS

DISPENSE 1 TICKET
```

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 WORLD CLASS BOWLING 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 **HOOK LEFT** and **HOOK RIGHT** together to exit this test.
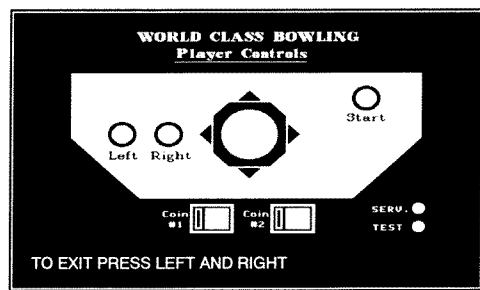
PLAYER CONTROL TEST SCREEN

GROM CHECKSUM TEST

Choose **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:

```
RUNNING GROM CHECKSUM TEST - 30 SECONDS TO FINISH
```

GROM CHECKSUM TEST SCREEN
(TEST IN PROGRESS)

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

```
WORLD CLASS BOWLING V1.00

GROM CHECKSUM TEST

GROM          CHECKSUM STAT

GRM0_0        XXXXXX        GOOD
GRM1_0        XXXXXX        GOOD
GRM0_1        XXXXXX        GOOD
GRM1_1        XXXXXX        GOOD

GRM0_2        XXXXXX        GOOD
GRM1_2        XXXXXX        GOOD
GRM0_3        XXXXXX        GOOD
GRM1_3        XXXXXX        GOOD

GROM CHECKSUM TEST:          (PASSED or
FAILED)

PRESS START BUTTON TO EXIT
```
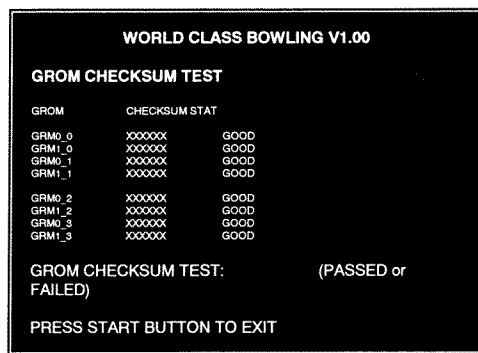
GROM CHECKSUM TEST SCREEN
(TEST COMPLETED)

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

2. 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.

3. 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.

```
WORLD CLASS BOWLING V1.00

VIDEO RAM TEST

VIDEO RAM FIRST PAGE STATUS     = 0000

VIDEO RAM TEST        [PASSED or FAILED]

PRESS START TO EXIT
```
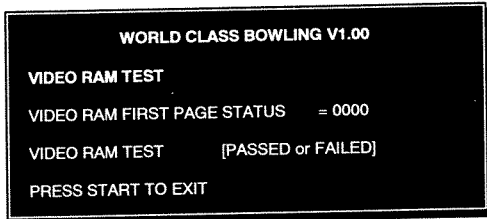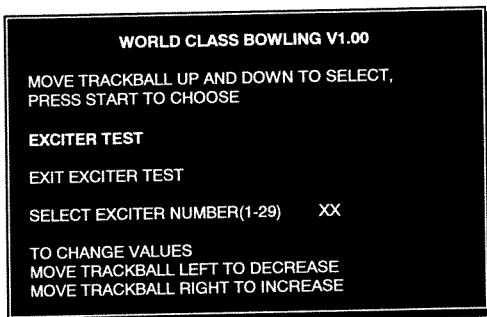
VIDEO RAM TEST SCREEN

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.

EXCITER TEST

This test performs a video and audio test of all the exciters in the game.

```
WORLD CLASS BOWLING V1.00

MOVE TRACKBALL UP AND DOWN TO SELECT,
PRESS START TO CHOOSE

EXCITER TEST

EXIT EXCITER TEST

SELECT EXCITER NUMBER(1-29)      XX

TO CHANGE VALUES
MOVE TRACKBALL LEFT TO DECREASE
MOVE TRACKBALL RIGHT TO INCREASE
```

EXCITER TEST SCREEN

You can view and test all of the exciter graphics from this menu. Move the trackball left and right to change the exciter number and press **START** to play the exciter. Check for any graphics and sound problems as they are displayed.

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.

```
GOLDEN TEE 3-D GOLF V1.00

PRESS START TO EXIT
VOLTAGE HISTORY IS SET TO OK ON EXIT

VOLTAGE ADJUST TEST

HISTORY:
                    VOLTAGE HAS BEEN OK

RIGHT NOW:
```
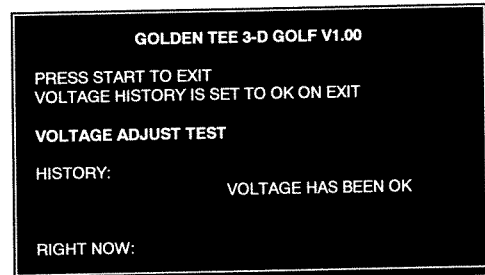
VOLTAGE ADJUST TEST SCREEN

Symptom	Probable Cause	Solution
No picture	Check Dip switches.	SW1-Dip switches 1 thru 4 must be "ON". SW2-Dip switches 1 and 2 must be "ON", and 3 and 4 must be 'OFF'
	Bad connections	Make sure there are good connections from the board's video outputs to the monitor's video inputs.
	Monitor	Make sure the monitor is operating correctly. (Check it with another compatible logic board.)
	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.
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 180º. (Refer to your monitor manual.)
Bad images in picture	Bad GROM	Do GROM test. Check IC pins to make sure none are bent over.
Diagonal white lines	GND problem	Earth and Logic GND's should be connected at the power supply.

SOUND PROBLEMS

Symptom	Probable Cause	Solution
No Sound	+12v power supply is bad	Try another +12v power supply.
	Bad connection to the board	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.
	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.
	Miscellaneous	Make sure the sound status light is flashing on the board.

Symptom	Probable Cause	Solution
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.
	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.
Coin counter not working	Miscellaneous	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.

POWER-UP PROBLEMS

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

Symptom	Probable Cause	Solution
Green L.E.D. not blinking	Program not running	Make sure all socketed I.C.'s 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.

APPENDIX B

JAMMA HARNESS CONNECTION

JAMMA HARNESS CONNECTION

WIRE COLOR	SOLDER SIDE			PARTS SIDE	WIRE COLOR
Black	GND	A	1	GND	Black
Black	GND	B	2	GND	Black
Red	+5 vdc	C	3	+5 vdc	Red
Red	+5 vdc	D	4	+5 vdc	Red
		E	5		
Orange	+12vdc	F	6	+12 vdc	Orange
KEY		H	7	**KEY**	
		J	8	Coin Counter	Red-Green
		K	9		
Yellow-Green	Left Speaker (-)	L	10	Left Speaker (+)	Yellow-Red
		M	11		
Green-Black	Video Green	N	12	Video Red	Red-Black
White	Video Sync	P	13	Video Blue	Blue-Black
Orange-Black	Service	R	14	Video GND	White-Black
		S	15	Test	Blue
Green-Blue	Coin2	T	16	Coin 1	Red-Blue
		U	17	Start 1	Red-White
		V	18		
		W	19		
		X	20		
		Y	21		
		Z	22	Player - Hook Left	Brown-White
		a	23	Player - Hook Right	Yellow-White
		b	24		
		c	25	Coin 3	Gray-White
		d	26		
Black	GND	e	27	GND	Black
Black	GND	f	28	GND	Black

TRACKBALL CABLE CONNECTION

Memory Board Connector		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
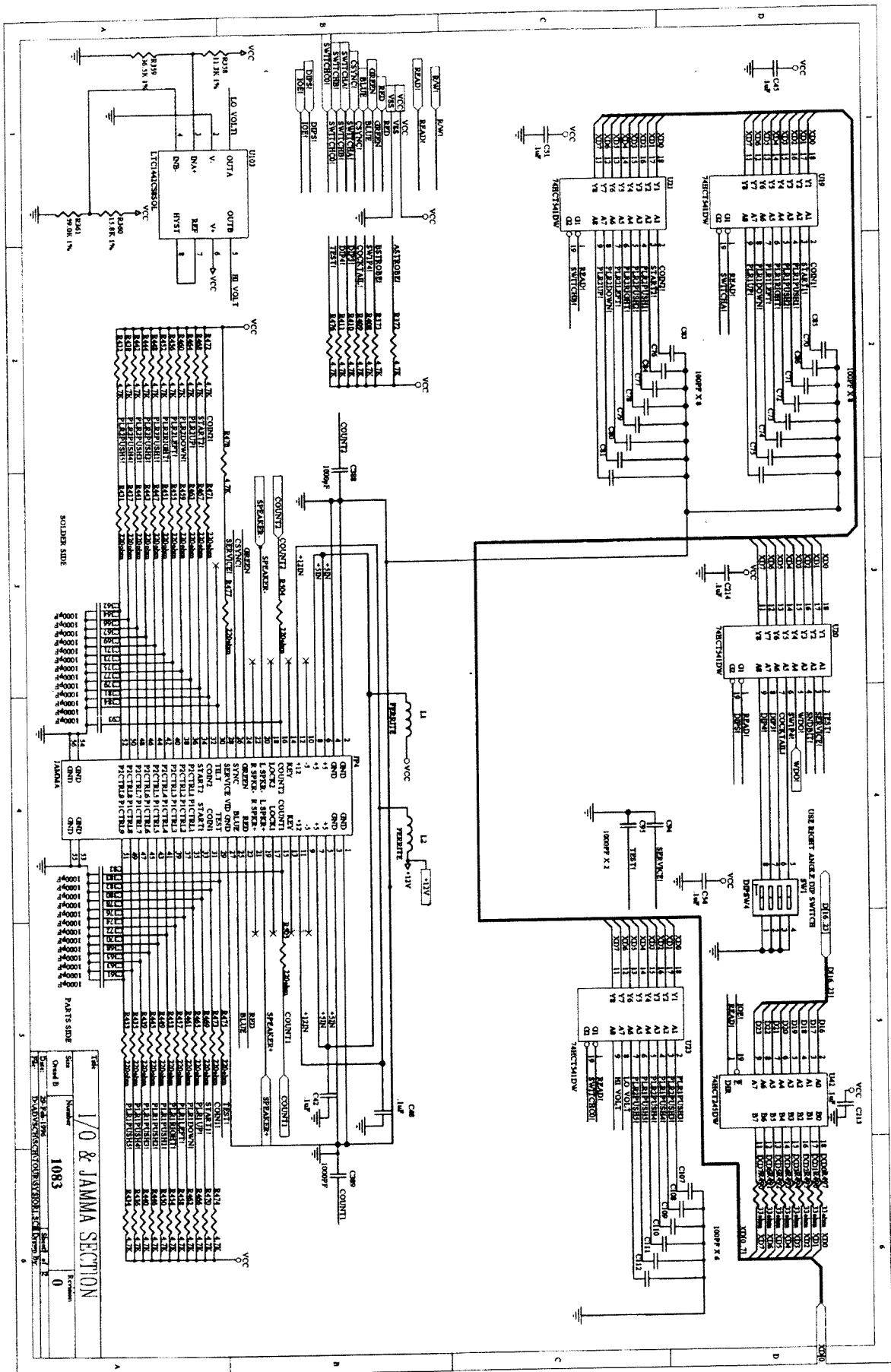
APPENDIX D

WARRANTY INFORMATION

WARRANTY, REPAIR AND RETURN POLICY

* 90-day warranty on all electronic components. All warranty periods begin on the date of purchase from Incredible Technologies, Inc.
* There is a minimum $55.00 service charge for all non-warranty repairs or returns.
* For all servicing, return to Incredible Technologies, Inc.
* ANY non-factory repair or attempted repair voids warranty.

RETURN MERCHANDISE AUTHORIZATION

* All returned merchandise must have a Return Merchandise Authorization (RMA) number marked clearly on the outside of the package.
* You must obtain all RMA numbers from your authorized Incredible Technologies distributor. Please have your Incredible Technologies serial number available when calling for an RMA number.
* Merchandise returned without an RMA number will not be accepted.
* Advance replacement boards will be shipped to distributors or, at the distributor's request, will be shipped directly to the operator.
* Advance replacement boards will be billed to the distributor until Incredible Technologies, Inc. receives the returned board, at which time a credit will be issued.
* All repairs and/or replacements will ship as soon as possible after receipt or request (subject to availability).

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 that have been damaged due to accident, abuse, improper installation, natural disaster, or unauthorized repairs or modifications.

IT excludes any and all implied warranties, including warranties of merchantability and fitness for a particular purpose, and limits the purchaser's remedy to returning the software, hardware, or documentation to IT for replacement.

IT makes no warranty or representation, either express or implied, with respect to this software, hardware, or documentation, their quality, performance, merchantability, or fitness for a particular purpose. This software, hardware, and documentation are licensed "as is," and the purchaser/licensee assumes the entire risk as to their quality and performance.

In no event will IT be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the software, hardware, or documentation, even if advised of the possibility of such damages. The warranty and remedies set forth above are exclusive and in lieu of all others, oral or written, express or implied. No person, seller, dealer, agent, or employee is authorized to make any modification or addition to this limited warranty.

Some states do not allow the exclusion of implied warranties or liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

INDUSTRY CANADA (IC) NOTICE

NOTICE: The Industry Canada (IC) label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local Telecommunications Company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

A representative designated by the supplier should coordinate repairs to certified equipment. Any repairs or alterations made by a user to this equipment, or equipment malfunctions, may give the telephone communications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection, that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas. **Caution**: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The **Ringer Equivalence Number** (REN) assigned to teach terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination of an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all devices not exceed 5.

REN: 1.0B

WARRANTY AND REPAIR SERVICE:

Incredible Technologies, Inc.
3333 N. Kennicott Ave.
Arlington Heights, IL 60004
(847) 870-7027 • (847) 870-0120 Fax
http://www.itsgames.com

<div align="right">

INCREDIBLE TECHNOLOGIES, INC
08/01

</div>

Incredible Technologies SALES AND SERVICE

Contact the following for more information on ITNet and Golden Tee Fore!

ITNet Sales Information:

Check the IT web site at www.itsgames.com for an Authorized Distributor near you.

Sales Director
Don Pesceone
Incredible Technologies, Inc.
(847) 870-7027 x189
(847) 870-0120 Fax
dpesceone@itsgames.com

Sales Coordinator
Debi Bott
Incredible Technologies, Inc.
(847) 870-7027 x130
(847) 870-0120 Fax
dbott@itsgames.com

ITNet Service Information

Technical Information:
Incredible Technologies, Inc.
847-870-7027 x 121

Warranty and Repair:
Incredible Technologies, Inc.
847-870-7027 x 177

Parts Orders:
Incredible Technologies, Inc.
847-870-7027 x 190

Mars Bill Acceptors:
Mars Technical Service
Phone: 800-345-8172

Wells-Gardner Monitors:
Wells-Gardner
Phone: 800-336-6630
Fax: 773-252-8299

Imperial Trackballs or Power Supplies
Imperial
Midwest: 800-386-7040
East Coast: 800-526-6261
West Coast: 800-423-2753

Happ Trackballs or Controls
Happ Controls
Phone: 800-BUY-HAPP

VER. 08/01 Contents subject to change without notice.