

# ARCADE TECH TRAINING

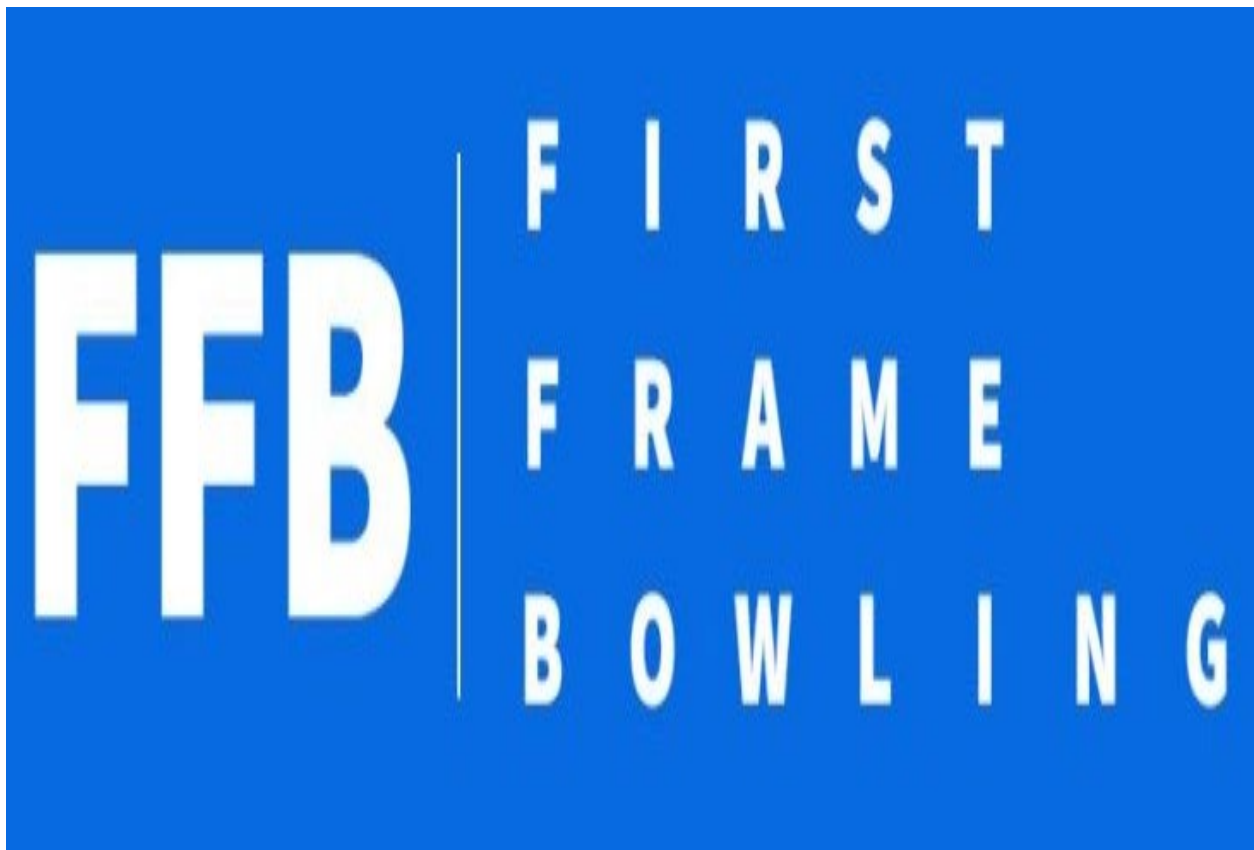
Instructor: Jeff Lemmons



Hosting center: RainForest Black Light Golf & Arcade

Dates: January 26th-29th, 2025

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## **Day 1**

Welcome to the Arcade Tech Training here at RainForest Black Light Golf & Arcade. Thank you all for being here. On behalf of FIRST FRAME BOWLING, we hope you enjoy your time and gain valuable knowledge that will help you in your career that lasts a lifetime.

This class is intended to help all attendees better understand the arcade side of the amusements business. Game repair, game diagnosis, preventative maintenance, simple electrical, arcade floor elements, redemption, and game reports.

This class will be divided between classroom instruction and hands on instruction on the game floor. We will use the knowledge gained in the classroom setting to apply it to the game floor when troubleshooting is needed.

In the back of this workbook are pages to make notes and to write down any questions you may have as we progress through the training. Please feel free to use these pages as we will have Q & A sections throughout the training.

Today we will do the instructor and attendee introductions, discuss the class objectives, go over the elements of an arcade floor, walk the game floor to get a visual of the different elements of an arcade floor, games, and state laws/licenses.



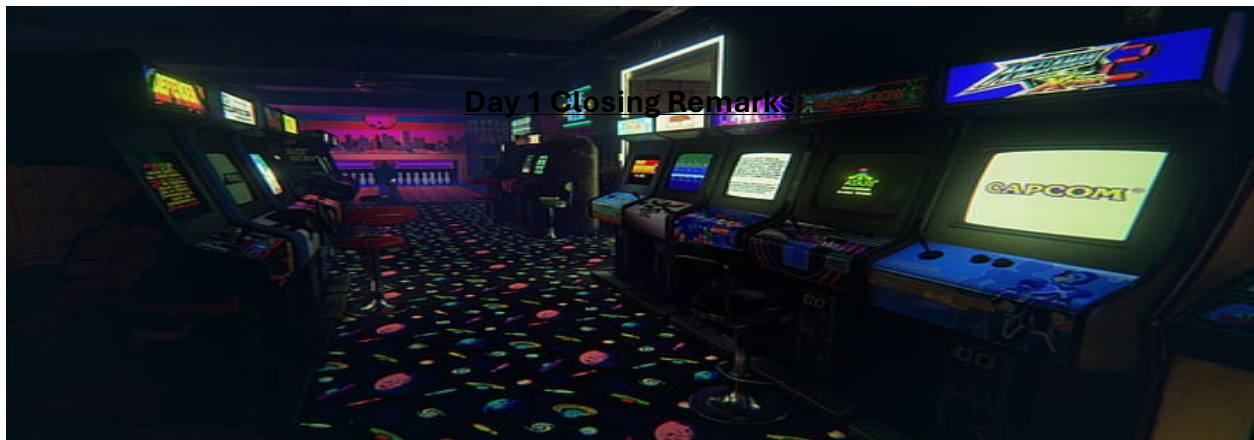
## **Class Objectives**

- Understand the different elements of a game floor (swipers, pos, kiosk, etc.)
- Learn the different types of games (video, prize, claw, etc.)
- Discuss the different manufactures of equipment
- Understand the key components in a game
- Troubleshoot and repair issues on games
- Understand how to use a multimeter and apply it to diagnosing a game
- Understand how back-office reports can help with finding issues
- Discuss technical support, parts, and redemption suppliers
- Discuss how a great preventative maintenance program can help minimize game downtime and prevent unnecessary issues from happening
- Understand how to splice wires
- Learn how to solder wires and use heat shrink
- Discuss the different connector types
- Understand how to use wiring diagrams when diagnosing a game
- Discuss common issues and tips and tricks when it comes to the game floor
- Discuss checklists and how they help with ensuring tasks are being completed daily, weekly, and monthly
- Discuss spare parts and how they can prevent games from being down for longer than necessary to maximize revenue
- Learn about calibration on games and why it is important to check calibration on games to ensure they are working as intended



### Elements of an arcade floor

- Arcade games
- POS system (Embed, Intercard, etc.)
- Kiosks
- Tellers
- Bill breakers
- ATM's
- Card swiper system (Embed, Intercard, etc.)
- Access points
- Radios
- Server
- Wi-Fi
- Redemption
- Prizes
- Stock for claws
- Cards/coins for pushers
- Balls/puck/etc.
- Tickets (if applicable)
- Coins for coin mechs (if applicable)





## Different ways to discover issues on the game floor

**Out of service log-** looking at the center's out of service log to see if there are any games currently out of service. (This is the easiest way to discover issues because the game is offline, and guests can't play the game.)

**Game floor walks-** walking the game floor to visibly look for issues or concerns. (By doing walks, you can look for visible errors on screens, a game is unplugged, turned off, screen off, and numerous other visible discoveries.)

**Game testing-** playing games on the floor to check for full operation. (Testing/playing games can help discover issues that may be overlooked by a visible inspection. Example: not crediting up, lights out, scoring issues, etc.)

**Reports-** running weekly reports can help discover issues that may have gone unnoticed or find obscure issues that could be commonly overlooked by the team (Examples: Looking at the bottom 10 games each week could help to show a game malfunctioning that guests know about and haven't let the staff know. Seeing a game consistently in the bottom could mean that it isn't dispensing cards/coins as it should, and guests aren't playing it.)

**Payouts-** checking payout percentages on games can help to find issues that might not be noticeable by just looking or playing the game (Examples: A game that is overpaying prizes/tickets could have a faulty sensor or board. If you notice a lot of guests winning the same prize could mean the claw strength wasn't adjusted properly when a new prize was placed in it.)

**Guests-** guests coming up to you to let someone know about an issue or concern (Example: A guest tells you about a game taking credits but not allowing them to play it.)

**Teammates-** teammates communicating about an issue or concern on the floor



## **State Laws & Licenses**

Each state has their own individual laws regarding arcades. It is recommended to inquire about these individual laws to protect your center from any possible fines for violating the state's individual laws.

Some states may require licenses for each individual game or playfields. As with the state laws, it is recommended to inquire about state licenses to protect your center from possible fines or seizures from the licensing agency. (Example: The South Carolina Department of Revenue requires games/playfields to have a license present and up to date, along with the center's name and address visible on the game.)

States may govern the price of an item allowed to be in a game, so be sure to know your individual state laws to protect your center.

Additionally, some cities may require individual licenses to be obtained and displayed properly on each game on your floor along with the state license.

**\*It is best to learn about your individual state requirements to ensure you are following all laws and regulations to ensure no fines or seizures will happen\***



## Games

There are different types of classifications for games based on the gameplay and style of the individual game. Video, claw, racing (video), prize, vr/motion, and coin pushers are a few examples of the classification types you will see on the game floor.

Every second a game is down, is a potential loss of revenue. Game floor walks before opening, throughout the shift, & at the end of a shift are important to staying ahead of guest issues or discovering issues that went undocumented. Some examples of staying ahead of issues are ice balls being properly balanced, basketballs balanced, errors displayed on screens, claws full, and air hockey paddles in place are just a few basic checks to prevent complaints or refunds.

When it comes to repairing games, **DO NOT BE AFRAID TO UTILIZE YOUR RESOURCES!!** Most game manuals can be found online to download for free. Technical support is usually just a phone call or email away. Utilize these resources as they will be key to helping resolve issues.

Weekly game tests should be performed to ensure proper operation of each game. Checking for loose steering wheels, loose game buttons, loose swipers, swiper guards in place, lights out, cosmetic issues, sticker/decals peeling, coins/cards dispensing, sensors scoring correctly, and switches working are just a small example of items to check during weekly checks.

**\*Build checklists and have team members sign off on tasks to ensure work/checks are being done. Randomly check behind them to verify\***





## **Day 2**

Welcome to day 2! Today we will focus our attention on a variety of topics that include:

- Any questions or comments from Day 1
- Reports
- Payouts
- Redemption
- Kiosks
- Electrical basics
- Connectors
- Splicing
- Voltage testing
- Power supplies
- Game buttons
- Wiring diagrams
- Coin hoppers
- Hands on troubleshooting



## **Redemption**

Redemption tends to be the first line of defense when it comes to arcade issues as most guests go to the redemption counter when they have an issue. Having your staff knowledgeable with basic repairs and the standard procedure on how to handle guest issues with games can help or hurt your center's image with those guests.

Having a "game issues" log behind the counter for teammates to write down any issues/complaints they receive during their shift can help the advanced techs know what the problems were and what games to investigate further for possible deeper issues. A simple template with the: date, time, game name, brief description, and reporting member's name, is a good baseline to start with.

Keeping track of what is selling and what's underperforming in redemption is vital to maximizing profitability. Don't be afraid to try new items!

Maintaining a monthly inventory of redemption products helps to discover theft rates (internal/external), establishing par levels, and maximizing profits, among many other factors.

Daily, weekly, and monthly checklists should be developed to assist with maintaining the game floor and redemption to the best it can be.



## Redemption

### Candy

Tootsie rolls  
Theater boxes  
Full size chocolate bars  
Peg candy  
Try random candy  
Suckers

### Claws

Big rubber ducks  
Small inflatable balls  
Generic plush  
Themed plush  
Candy/rubber ducks  
Ice crystals in bottoms

### Novelty

Seasonal high prize items  
Venue themed items  
Branded items  
Area specific items  
Retro items

### High Prize

Gaming systems  
Trendy items  
Seasonal  
Anime characters  
Figurines  
Retro gaming systems

### Plush

Pokémon/Pokéballs  
Pickle Rick  
Sonic  
Generic (smiley faces)  
Pacman  
Ella the Elephant

### Lights/Lamps

Lava lamps  
Light up signs  
Night lights

### Gag Items

Hand buzzers  
Rubber chickens  
Hand cuffs  
Disappearing ink  
Rubber band shooters  
Cap guns

### General Help

Fill it up  
Maximize space  
Think outside the box  
Half off days  
Double points day



## **Redemption Suppliers**

- **A&A Global** (variety supplier)  
[www.aaglobal.com](http://www.aaglobal.com)
- **Redemption Plus** (variety supplier)  
[www.redemptionplus.com](http://www.redemptionplus.com)
- **BMI Merchandise** (variety supplier)  
[www.bmimerchandise.com](http://www.bmimerchandise.com)
- **The Toy Factory** (plush) \*soft filled for cheaper freight\*  
[shop.thetoyfactory.biz](http://shop.thetoyfactory.biz)
- **Amazon** (high prize & trending products)  
[www.amazon.com](http://www.amazon.com)
- **Wal-Mart** (seasonal plush & clearance items)  
[www.walmart.com](http://www.walmart.com)
- **Sam's** (candy)  
[www.samsclub.com](http://www.samsclub.com)
- **Costco** (candy)  
[www.costco.com](http://www.costco.com)

**\*This is a basic list of suppliers, there are other options available\***

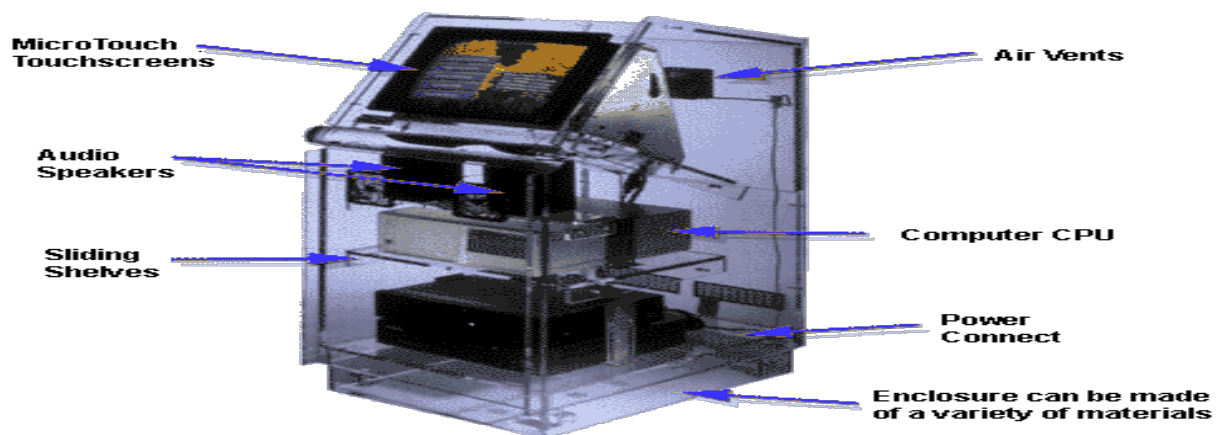
**\*Some suppliers offer free freight on orders over a certain amount, reach out to individual suppliers to discuss free freight order minimums\***



## Kiosks/Tellers

In this section we will discuss the different parts and common issues of a kiosk/teller. Below are a few topics we will dive into.

- Troubleshooting
- Cash acceptor issues
- Card dispenser issues
- Receipt printer issues
- “Rejection” card area
- Intercard “secret” menu
- Tech support to test/troubleshoot
- Credit card processors
- Mag reader issues & cleaning
- Com ports failing on the PC
- Dip switches on Intercard bill validator
- Bill holding box issues
- Disabling features while awaiting parts





## **Card set machines**

In this section we will discuss the different parts and common issues of a card set machine. Below are a few topics we will dive into.

- Troubleshooting
- Coin acceptor issues
- Card acceptor issues
- Coin “color” relearn
- Adding new cards/coins/games
- Daily tasks
- Intercard “fishing” issues
- Adjusting the barcode scanner
- Swiper issues and cleaning
- Mag reader issues and cleaning

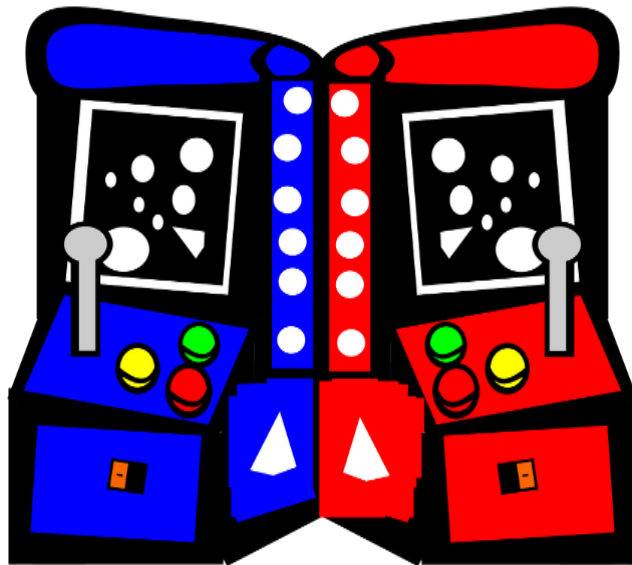
**\*If you have local competition, keep in mind that guests may bring cards/coins from the competition and attempt to use them in your center. Typically, they will have a couple letters at the beginning of the barcode that alert you they are from that company. Example: Main Event has a “ME” at the beginning of the barcode. The card set machine will reject these cards as the barcode isn’t programmed into your machine\***

# FFB

F I R S T  
F R A M E  
B O W L I N G

## Anatomy of an arcade game

- Game button
- Computer
- Wiring
- Fuses
- Power supply
- Main board
- I/O board
- Ticket mechs
- Coin mechs
- Motors
- Sensors
- Handles
- Wheels
- Bearings
- Prize doors
- Lights
- Speakers
- Audio board
- Monitor
- Balls/pucks/coins



**\*This is a broad overall list as each game will have similarities and differences depending on the manufacturer, year produced, along with numerous other factors\***



## **Electrical**

When it comes to electrical, SAFETY is first and foremost! Always disconnect the power from any game before doing any electrical testing. If advanced testing is needed on a powered-on game, please have a qualified technician perform the testing to ensure personal safety and protection of components inside the game.

Please understand this is only the basics of electrical to apply to arcade repair and not an advanced electrical module that explains the in-depth principles of electricity.

The electrical section of this training module will be focused on the following:

- Understand what AC & DC voltage are and where they apply in games
- How to use a multimeter to test for different voltage types
- How to test for a broken wire or blown fuse using continuity
- How to identify different connector types
- How to splice wires using different connector types
- How to replace burnt/corroded/broken connectors
- How to solder wires and use heat shrink to protect the connection
- How to test power supplies for input and output voltage
- Wiring diagrams and how to use them to trace wires for testing
- How to test a microswitch
- Understand the makeup of a basic game button
- Understand the basic electrical components you will find in the field





## **Electrical**

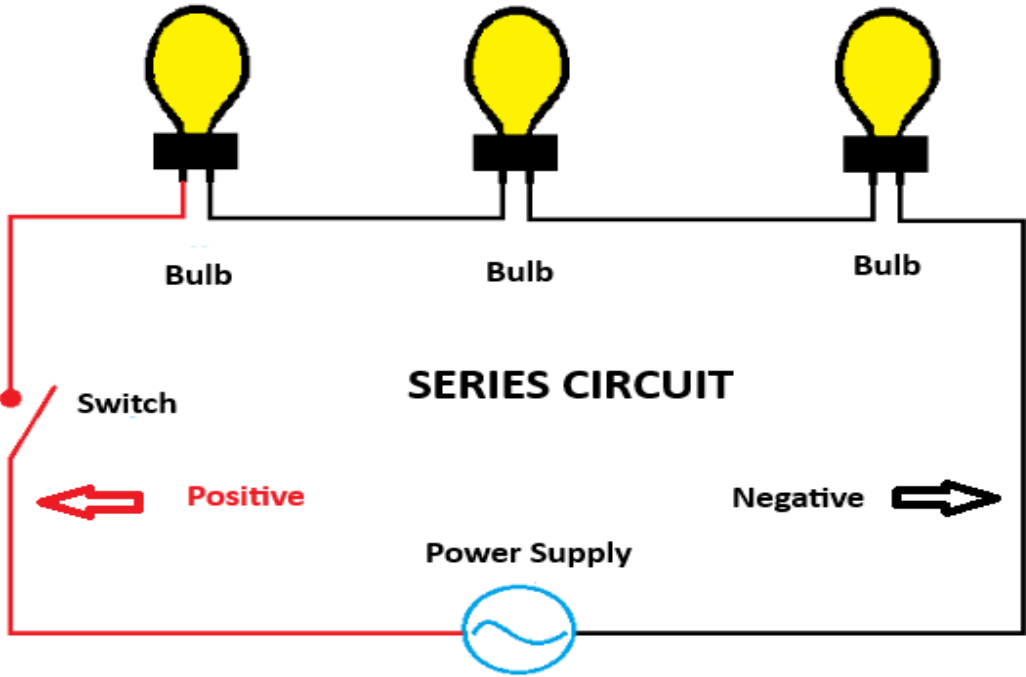
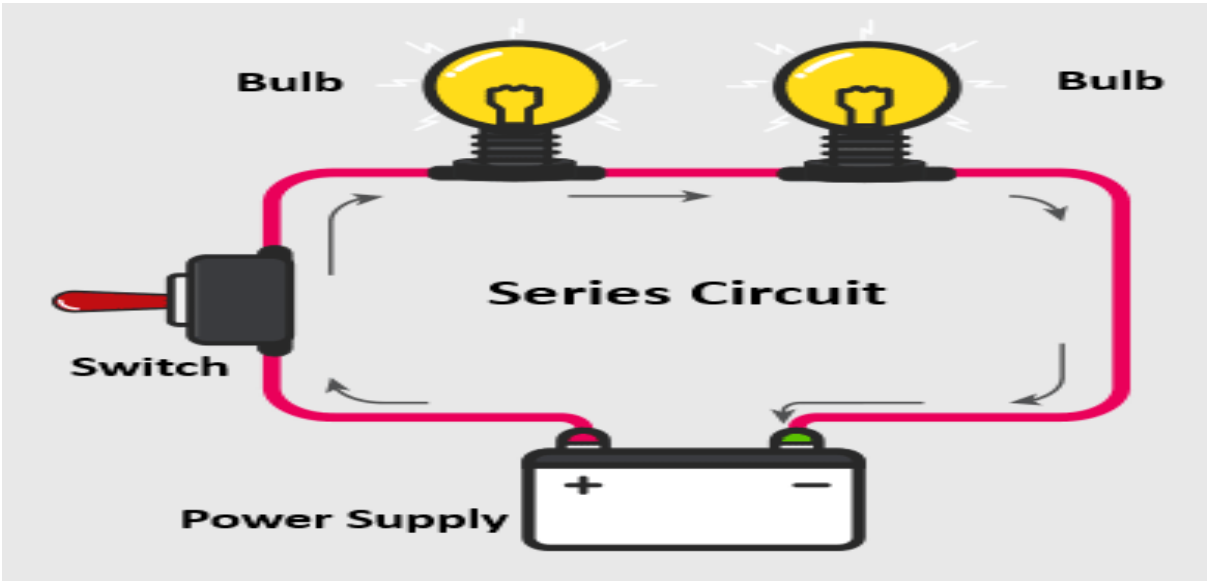
Again, this is only the basics to aid with testing/diagnosing individual components, repairing connections, and understanding the makeup of electrical circuits in an arcade game. Electricity principles can take countless hours to understand every little thing about it. With this module, you should be able to efficiently troubleshoot electrical issues and find the faulty component or components by applying the basics discussed.

\*If your center has multiples of the same game, comparing readings or swapping components from one to the other can help in the diagnostic process\*

\*If swapping parts from one to the other, please be careful as you could damage a known good part due to another issue with the faulty game\*

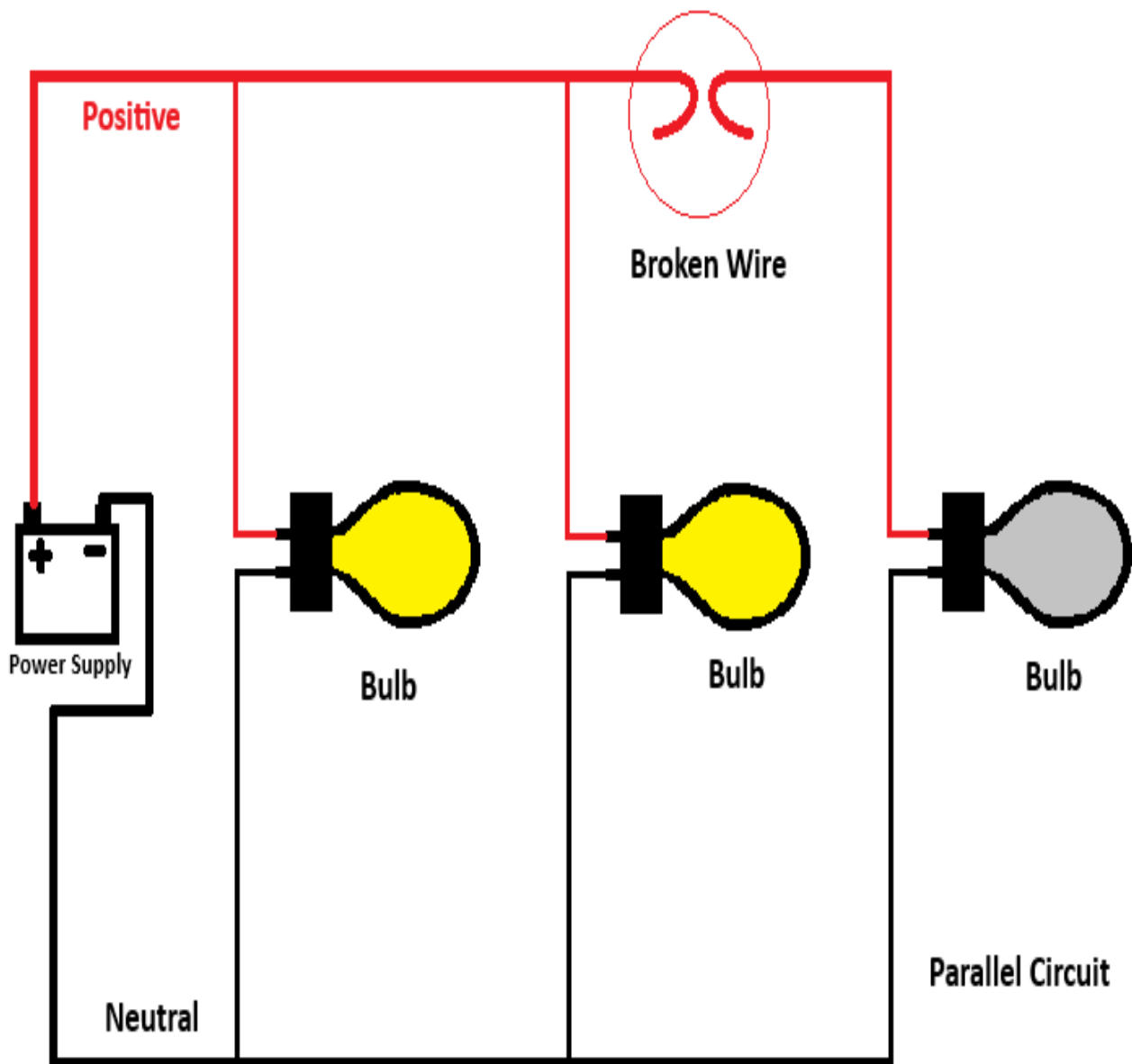
**Electrical Circuits**

**Series Circuit:** electrical circuit with only one path for current to flow



**Electrical Circuits**

**Parallel Circuit:** electrical circuit made up of 2 or more different paths for current to flow



**Connectors**

There are many different types of connectors being used daily in different industries, below are examples of commonly used ones. We will discuss a few of these as they relate to the Amusements side of this training.

**Spade female**



**Spade male**



**Fork**



**Ring**



**Butt**



**Bullet**



**Lever**



**Quick**



**Solder Sleeve**



## Splicing

Splicing is bonding two or more wires together to create a connection between them. This can be done in multiple ways. We will discuss a few of those ways and practice creating those connections during this section.

**Butt**



**Solder Sleeve**



Prepare the wires



Insert into the connector



Crimp

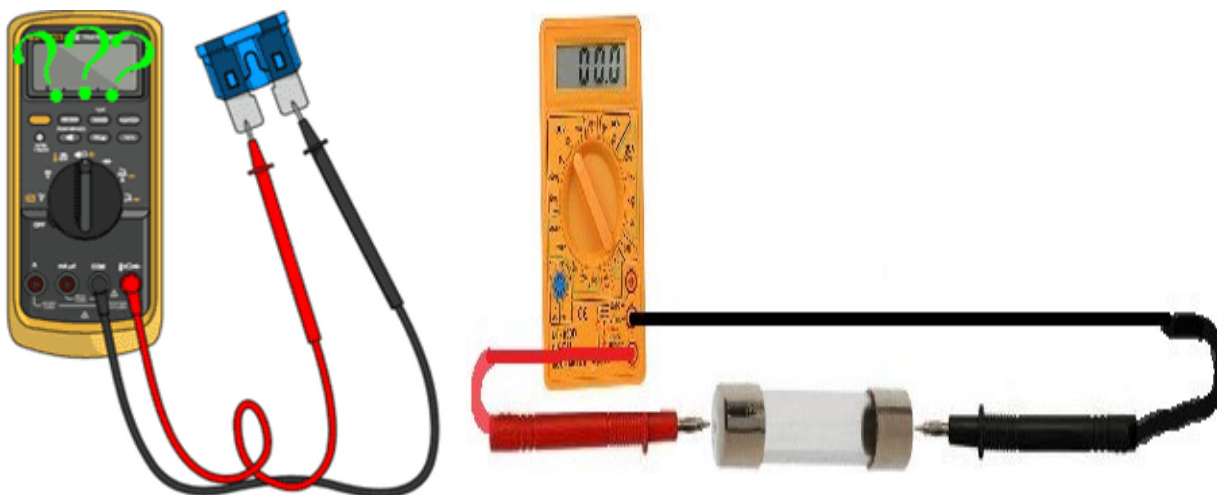
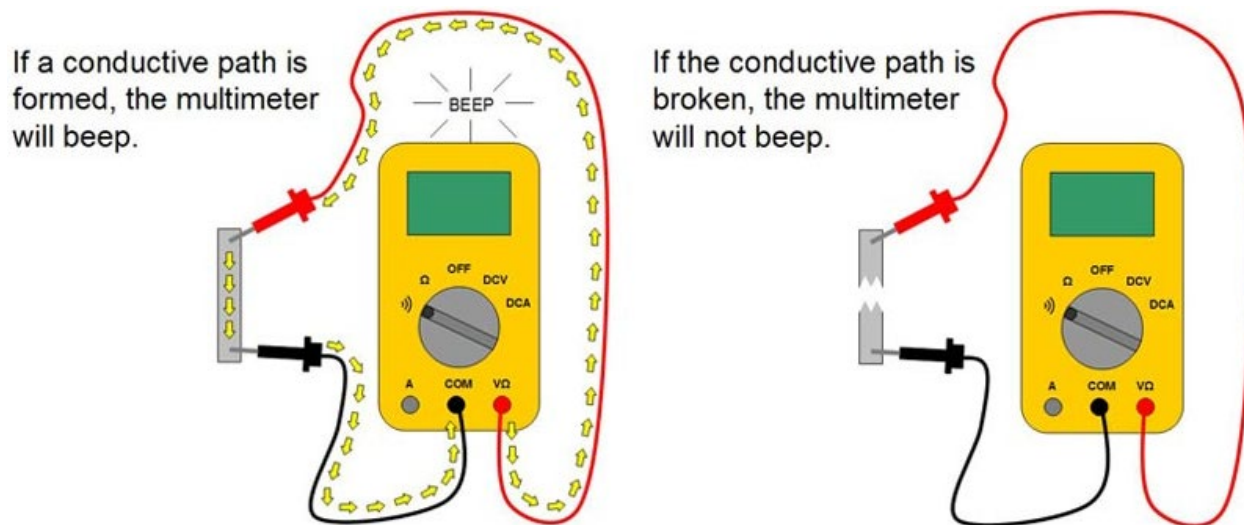


Use a hot air gun



## Continuity

Continuity is a completely connected circuit for current to be able to flow. Continuity checks can be performed to test for a blown fuse, broken wire, or even a faulty switch.





## Voltage testing

Testing for voltage may seem basic to some but it is often overlooked as the main source of an issue. Keeping it simple and starting from the source is the best plan of action when it comes to diagnosing a game that appears to have no power to the entire game or multiple areas of the game. As we progress in this class, you should be able to identify checking AC voltage versus DC voltage.

When testing for voltage, it is important to practice safety around any live equipment. If you are second guessing yourself or don't feel comfortable testing live equipment, please seek a trained professional to help with testing live electrical equipment.



V	Volts
A	Amperes
mA	milliamps
$\Omega$	Ohms
~	AC
—	DC
➔	Diode test
🔊	Continuity test
Hz	Hertz
— —	Capacitance

## MULTIMETER SYMBOLS



## Power Supplies

Power supplies provide electric power to a load. They come in different shapes and voltage types. Typically, they convert AC voltage to DC voltage. In this section we will be examining switching power supplies and testing the input and output voltages on a few examples.

**Regulated**



**AC Adapter**



**Linear**



**DC Power**



**Switching**



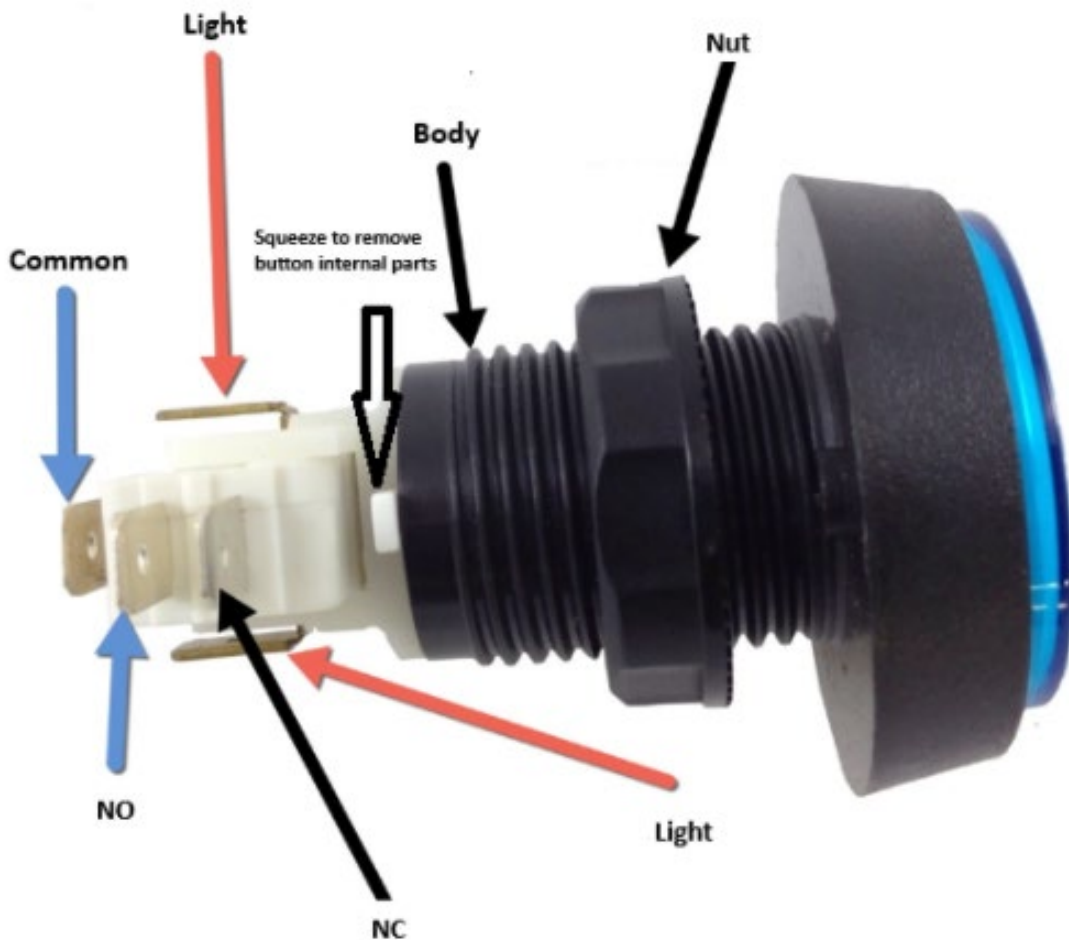


# FFB

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B O W L I N G

## Game Buttons

While game buttons may come off as a simple issue to some, there are plenty of places in the amusements industry that have games down due to a simple game button repair. Having a few of the common style game buttons in your inventory is recommended as it is a lost cost item that could cause a loss in revenue. Parts between the different buttons are often interchangeable and allow for a simple quick fix until the OEM button can be ordered and installed.





## Reports

Reports are often not thought about when it comes to the technician side of an arcade floor. Reports can help in determining if a game has an issue by looking at the payout percentage for each game. That could include overpaying, underpaying, hardware issues, swiper issues, and software problems.

Being proactive with checking reports can help with finding issues and help with preventing abnormal guest redemptions. This can help with inventory control and help maximize profits while ensuring guests are getting a fair value for their money spent to play.

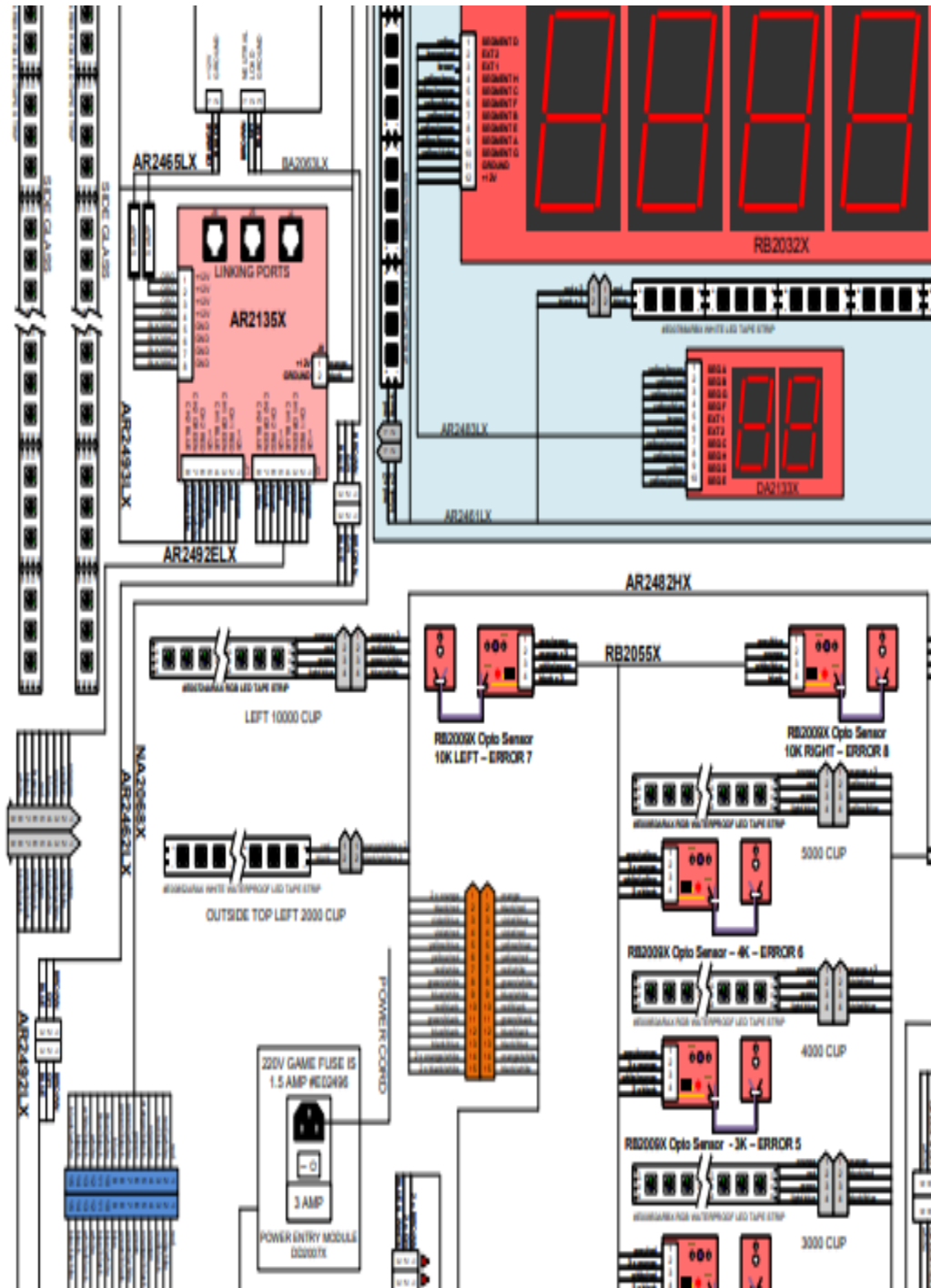
Aside from finding technical problems with games, reports can be used to determine which games are underperforming. By checking to see what games aren't performing well, you can decide if you should relocate a game to a higher performing area of the game floor. When deciding if a move should happen, be cautious and check to see if there are other options to boost that area (poor lighting could be affecting guest appeal to visit that area).

Redemption reporting is another viable resource in determining underperforming items, theft, inventory control, and ordering practices, to name a few.

**\*Checking reports can be very time consuming and can take time to understand. Utilize your resources if you need help while looking at them\***



## Wiring Diagrams









## Day 2 Closing Remarks

- LEARN YOUR GAMES! Knowing your games is invaluable as the possibilities to speed up the troubleshooting phase is endless by knowing how your games are intended to operate at full capacity
- Don't overthink when it comes to diagnosing a game, to often we don't keep it simple and miss the simple issues
- Any questions or comments?
- Remember to practice safety when performing tests on live equipment
- When splicing, don't forget the pull test
- If you have an amusements manager, speak to them about payouts and reporting to ensure games are working properly from that standpoint as those errors may go unnoticed if someone isn't checking them



## Day 3

Welcome to day 3! Today we will be focused heavily on the game floor. We will be troubleshooting issues, testing voltage, and discussing checklists among other items. Remember to use your resources when troubleshooting games. Game manuals, technical support, and team members are examples of resources available to utilize.



## Common Issues

Common issues vary from center to center based off many factors. Game types, age of games, preventative maintenance, and amount of gameplay are a few factors. Some examples are.

- Monster drop balls wear out & need replacing to prevent “ghost” balls
- Sensors vibrate loose (Ice Ball FX is a good example)
- Quik Drop sensor gets dirty & causes errors
- Orange pegs on Fishbowl Frenzy break (balls get stuck in playfield & blower area)
- Pusher rods break on coin pusher motor assemblies
- Motors fail (pusher motors, carousel motor on Quik Drop, etc.)
- Silk screen on Hyper Pitch breaks
- Swipers are damaged due to ice/skee balls (swiper protectors are available)
- Wires break at Down the Clown motors
- Gate bolts work loose on Hot Shot
- Qube has gun issues (new style gun available)
- V.R. headset cables fail & have headset issues
- Microswitch failure in numerous games
- Wires break on Eclaw grabber cable
- Claw solenoid failure on numerous claw machines
- Monitors fail (use a computer monitor to test for bad monitor)
- Game buttons break (microswitches, plastic tabs, spring)
- Camera & board fail on Big Buck Hunter
- Photo booth printers should be sent off for maintenance
- Ice Man filters need to be cleaned regularly to prevent overflowing



The logo for FFB (First Firm Framing) is displayed in large, bold, white letters on a blue background.The words "FIRMS T FRAMING" are displayed in a grid of white letters on a blue background. The letters are arranged in three rows: "F I R S T" in the top row, "F R A M E" in the middle row, and "B O W L I N G" in the bottom row.

### Tips & Tricks

- Keep it simple! Don't overthink!
- Create an opening & closing checklist
- Game zone "how to" guide for new hires
- Make a "janitor's cart" for deep cleaning games
- When installing parts, write the date installed on it
- Show the team the "small" tasks to alleviate the workload
- Label arcade breakers with "drop and rec #" location chart
- Try "game of the week or month" for underperforming games
- Not every employee/manager is the same. Each place is different
- Check your payouts to make sure you aren't over/under paying out
- Check your contract with POS suppliers as some offer free online training monthly
- Make a label with the "warranty end date" on new games and place inside cabinet somewhere
- Keep a log on games for parts installed on them to keep track of common issues, random failures, etc.
- If unsure about a faulty part and you have a duplicate game, swap the parts and see if the problem follows
- Make sure to communicate with the appropriate person to ensure stock/parts/supplies don't hit zero
- Create par levels for certain normally stocked items (Example; when you get down to 3 boxes of Willy Wonka cards, you place an order for more)



## Checklists

Just as in every area of the venue, checklists should be developed and followed with the amusements side of the business. Checklists will vary from location to location based on the number of games, type of games, and countless other factors. Keep your checklists simple and doable. Creating complex and rigorous checklists can increase the workload of a team member to the point they aren't able to complete the tasks.

If checklists are in place already, look at them to see if anything should be added or taken away. Walk the floor and see if the tasks are being performed properly. Training may need to take place to help the team understand why this or that is being done or even how to properly execute a given task.

Daily, weekly, monthly, and annual checklists are a good baseline to start with and develop to ensure the game floor always remains at 100% as possible from games up and operational to general game floor cleanliness.

A game deep cleaning checklist should be developed as well to ensure all games are being deep cleaned and checked at least once throughout each month depending on the total number of games on your floor. An average of 3-5 games throughout the day should be an attainable task and allows for ample time to ensure the games are properly maintained.

If you have other amusement attractions such as laser tag, mini golf, karting, bumper cars or any other attraction, it would be best to create a separate deep cleaning list for those attractions but don't forget to incorporate them into your daily, weekly, monthly lists with these attractions if the same team members are working those areas as well.

**\*The following are just examples to use as a guide or starting point\***



### Checklist Example

#### **Daily**

- Check out of service log
- Walk the game floor
- Redemption walkthrough
- Balance balls/bean bags/etc. in all games that require this
- Check for trash/spills/drink rings/etc. around the floor, on tables, & on games
- Empty card set machine (some centers may not have this)
- Check card/paper levels in all tellers
- Restock cranes/ticket rolls/pushers/etc.
- Restock & organize redemption area
- Deep clean assigned games on deep cleaning checklist
- Clean glass on all games

#### **Weekly**

- Place redemption order
- Game button check
- Empty silver coin catch trays/areas on coin pushers
- Check operation of every game
- Check lights on every game
- Steering wheel check
- Wipe down all table bases
- Calibrate all shooter games
- Deep clean trash cans (coordinate with the rest of the venue to do all at once)

#### **Monthly**

- Inventory
- Cosmetic game check (trim, stickers, plastic, etc.)
- Check all tables & chairs for issues (document or repair)
- Check for gum on the floor (document or remove)
- Wear & tear check (handles, mallets, basketball nets, etc.)
- Speaker & volume check (to low, to loud, speaker blown?)
- Clean filters on water games

**FFB**

**F I R S T  
F R A M E  
B O W L I N G**

Troubleshooting

**Is it plugged in?**

**Is it turned on?**

**Have you turned it off and back on?**

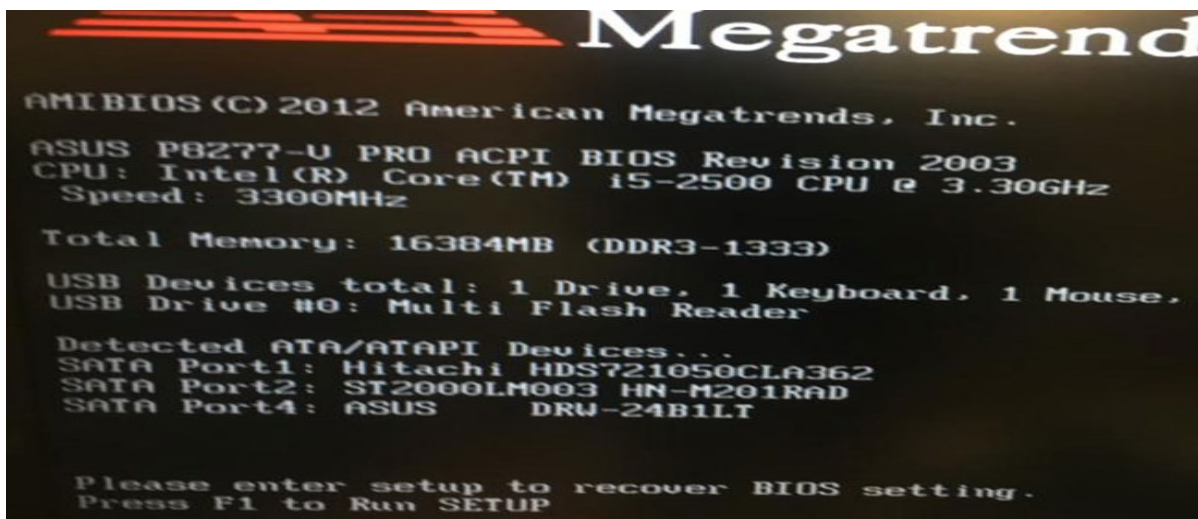
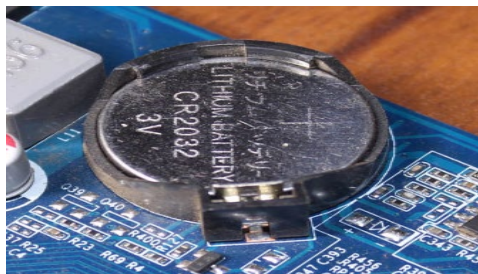


**These are simple questions, but you would be surprised how often it's that simple to fix many game issues**



## CMOS Battery and BIOS

CMOS batteries must be replaced every so often and then the BIOS setting may need to be adjusted to correct the boot order and the auto power on feature.



F10 to enter

File-> set date and time

Storage ->boot order-> UEFI and legacy->CD drive 1<sup>st</sup>, Hard drive 2<sup>nd</sup>

Advanced->power on options->after power loss->on

G4 Bios -Press F10 to enter

Advanced->boot options->after power loss -> power on



## Swipers

Swipers vary from manufacturer to manufacturer and typically the company the games are purchased from handle installing the swipers on the games during the installation process. You can reach out to your specific POS provider for assistance to help with swiper related issues.

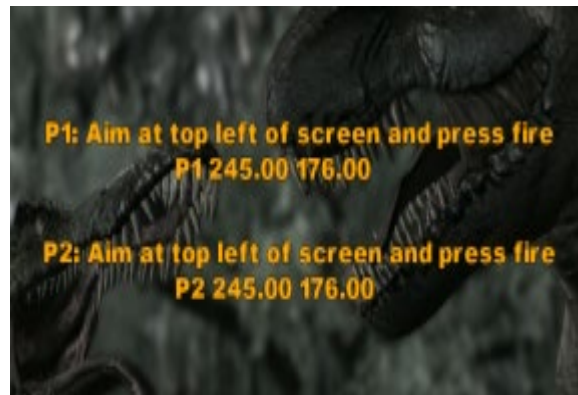
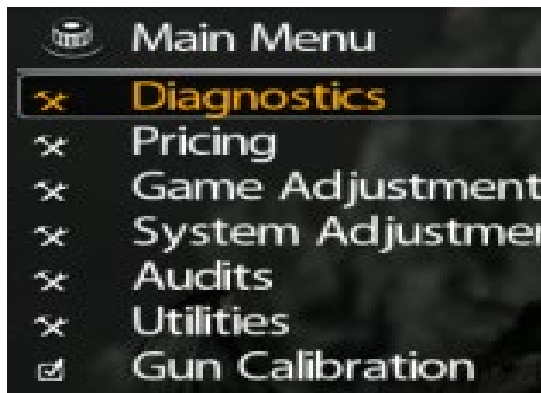




## Calibration

Calibrating games are important for guest experience, payouts, and refunds to name a few reasons. Most of us think of shooter games like Big Buck Hunter, The Walking Dead, Tomb Raider, or Jurassic Park when it comes to calibration.

Games such as Wheel of Fortune, King Kong, Cruisin' Blast, Dizzy Chicken, and V.R. Rabbits require calibration as well. These are just a few examples of other games that need calibrating. Refer to each game's manual to follow the proper steps in calibrating any game that requires it.





## Spare Parts

Spare parts can help prevent revenue loss, game downtime, and help in the aid of diagnosing an issue. The following are examples of spare parts that some centers may choose to have on hand to help maintain their floor to be at 100% as possible.

- Boxer padding & punching bag
- Game buttons (various sizes)
- Game button lights
- Game lights that commonly fail
- Photo booth paper
- Pusher coins & cards
- Hockey pucks &
- Basketball nets
- Coin hopper
- Steering wheel belts
- Coin pusher rods
- Joysticks
- Power supplies (5 volt & 12 volt)
- Game cards
- Teller paper
- Ping pong balls
- Monster Drop & Monster Drop Extreme orange belts
- 5k potentiometer
- Big Buck camera & board
- Variety of microswitches
- VR headset cables/headset/padding/ straps
- Assortment of fuses
- Computer monitor with a DVI/HDMI/VGA/USB port to test for faulty monitors





## Repairs

Learn your games! Know what is supposed to move, light up, open, release, etc. before, during, and after “playing” the game. How can you repair your game if you don’t know that something isn’t working? Examples: Do you know if the marquee on Bop It is designed to flash in attract mode? Did you know on Down the Clown, the carnival cannonball stuntman moves left to right during gameplay? Do you know what the “attract” music is for NBA Hoops?

Learn how to calibrate all games that need calibrating.

Don’t just rely on what someone said was happening with a game. Test it yourself. You may discover problems that weren’t relayed by testing it yourself.



## Day 3 Closing Remarks

- Remember to build your checklists to be simple, straightforward, and attainable for the team
- Make notes of common issues to train your team on them
- Keep it simple! Seriously, keep it simple and work your way through the diagnostic process of an issue



## **Day 4 Overview**

Welcome to our final day! Today we will discuss preventative maintenance and how developing a standard P.M. program can help keep your game floor in good shape and help with finding issues that may be overlooked from basic game plays. We will troubleshoot more issues today, discuss helpful tools to help when on the floor, and we will close out the day with an open discussion.

### **Preventive Maintenance**

Preventive maintenance tends to get overlooked in centers, but not doing it can cause bigger problems or cost centers more in the long run. There are many factors that cause this to be overlooked but we will focus on what preventative maintenance is and how to perform these practices safely and efficiently to keep your game floor as well maintained as possible. Create a P.M. program based off your game floor. If you have other amusements that teammates run while on a typical shift, incorporate a P.M. program that includes those amusements to help maintain them as best as possible.

### **P.M. Tips & Tricks**

- Don't overload the team with expectations that aren't attainable
- Consider your typical busy shifts and factor them into your P.M. program
- Don't just put it on paper, show your team the proper way to perform the preventative maintenance expected of them



## Tools

Having the right tools for the job can speed up the repair process. Each center will be different with what is needed or used. The following list is just a sample of tools used or needed for repairs.

- Rolling tool cart
- Specialty bit set
- Standard wrench set
- Metric wrench set
- Standard socket set
- Metric socket set
- Screwdriver set
- Hot glue gun
- Drill/driver set
- Soldering station
- Vacuum cleaner
- Air compressor
- Drill bit set
- Flashlight
- Multimeter
- Hammer
- Ticket emulator
- Hacksaw
- Impact bit set
- Plier set

**\*Build your toolset based on your center needs and P.M. program\***



## **Post Training Questionnaire**

### **Training takeaways?**

- 

- 

- 

### **Recommendations/thoughts overall?**

- 

- 

- 

### **On a scale of 1-5 (with 5 being the highest), how would you rate the training you received?**

-



## Glossary

**Alternating current-** electrical current that reverses its direction continuously with time

**Amperage-** the measurement of electrical current flow

**Battery-** electrochemical device containing one or more cells that converts the chemical energy to electricity to be used for a source of power

**Capacitor-** stores electrical energy and contains an insulator to separate the conductors inside

**Card set-** a machine used in arcades to award points based on preset card values

**Circuit-** a path to transmit electrical current

**Circuit breaker-** electrical safety device used to protect damage to an electrical circuit due to excess current

**Closed circuit-** electrical circuit that allows for a continuous path for current to flow with no interruption

**Connector-** electromechanical device that creates a connection between parts of a circuit to join them together

**Continuity-** a completely connected circuit that allows a path for current to flow

**Current-** flow of electricity in a circuit that is measured in amps

**Dead short-** electrical short that has no resistance down an unintended path to carry current

**Direct current-** electrical current that flows in one direction only



## Glossary

**Fuse-** electrical safety device used to protect damage to an electrical circuit due to excessive current

**Ground-** common path for electrical current to return

**Hertz-** frequency of oscillations used for alternating current electricity

**Input-** voltage value supplied for an electrical component or device

**Junction-** point where two or more electrical conductors are joined together by physical contact

**LED-** light emitting diode

**Load-** component in an electrical circuit that consumes power to turn it in different forms of energy

**Neutral wire-** allows current in a circuit to flow back to its source of power

**Normally closed-** contact point that is closed normally in an electrical circuit allowing electricity to flow

**Normally open-** contact point that is normally open in an electrical circuit preventing electricity to flow until it is closed

**Multimeter-** a tool used to measure voltage, continuity, ohms, and other measurements

**Ohms-** unit used to measure electrical resistance in a circuit

**Output-** voltage value released from a device

**Parallel circuit-** electrical circuit made up of 2 or more different paths for current to flow

**Power-** rate that electrical energy is transferred by a circuit



## Glossary

**Power supply-** device that supplies power to a load in a circuit

**Relay-** electrically operated switch used to turn off and on a larger electric current

**Resistance-** opposition of current flow in an electrical circuit

**Resistor-** passive electrical component that provides resistance in a circuit

**Schematic-** diagram showing the layout of all the wires in a circuit and where they are connected

**Series circuit-** electrical circuit with only one path for current to flow

**Short circuit-** electrical short in a circuit that has no resistance down an unintended path to carry current

**Soldering-** act of joining 2 metals together by melting a metal alloy

**Soldering iron-** tool used to melt solder during the soldering process

**Splicing-** joining two or more conductor endpoints

**Swiper-** device used to accept credits on an arcade game

**Switch-** device used to turn an electrical circuit off and on

**Teller-** device used to purchase or reload game cards

**Transformer-** passive device that transfer energy from one circuit to another

**Voltage-** pressure from the power source in an electrical circuit

**Wire-** used to distribute electricity in a circuit

**Wire gauge-** wire diameter size

**Wiring Diagram-** diagram showing the layout of the connections in a circuit



## Vendor Log

### Card Swiper Providers

#### **Amusement Connect**

[www.amusementconnect.com](http://www.amusementconnect.com)

1-833-727-2233

#### **Embed**

[www.embedcard.com](http://www.embedcard.com)

1-469-521-8000

#### **Intercard**

[www.intercardinc.com](http://www.intercardinc.com)

1-800-732-3770

#### **Sacoa**

[www.sacoacard.com](http://www.sacoacard.com)

1-407-499-1876

#### **Semnox**

[www.semnox.com](http://www.semnox.com)

1-610-400-8901

These are a few of the main suppliers of card swipe systems.





## Vendor Log

### Arcade Game Manufacturers

#### **Adrenaline Amusements**

[www.adrenalinearcade.com](http://www.adrenalinearcade.com)

1-450-824-1671

#### **Andamiro**

[www.andamirousa.com](http://www.andamirousa.com)

1-310-767-5800

#### **Apple Industries**

[www.appleindustries.com](http://www.appleindustries.com)

1-516-619-8000

#### **Arachnid**

[www.arachnid360.com](http://www.arachnid360.com)

1-815-654-0212

#### **Bandai Namco**

[www.bandainamcoent.com](http://www.bandainamcoent.com)

#### **Bay Tek Industries**

[www.baytekent.com](http://www.baytekent.com)

1-920-822-3951

#### **Benchmark Games Inc**

[www.benchmarkgames.com](http://www.benchmarkgames.com)

1-561-588-5200

#### **Bobs Space Racers**

[www.bobsspaceracers.com](http://www.bobsspaceracers.com)

1-386-677-0761

#### **Chicago Gaming Company**

[www.chicago-gaming.com](http://www.chicago-gaming.com)

1-708-780-0070



## **Vendor Log**

### **Arcade Game Manufacturers**

#### **Coast to Coast**

[www.coasttocoastcranes.com](http://www.coasttocoastcranes.com) 1-800-224-1717

#### **Coastal Amusements**

[www.coastalamusements.com](http://www.coastalamusements.com) 1-732-905-6662

#### **Deltronic Labs**

[www.deltroniclabs.com](http://www.deltroniclabs.com) 1-215-997-8616

#### **Elaut USA**

[www.shopelautusa.com](http://www.shopelautusa.com) 1-732-494-4900

#### **ICE**

[www.icegame.com](http://www.icegame.com) 1-716-759-0370

#### **JET Games**

[www.jetgamesusa.com](http://www.jetgamesusa.com) 1-855-538-4263

#### **Kalkomat**

[www.kalkomat.com](http://www.kalkomat.com)

#### **Konami**

[www.konami.com/en/](http://www.konami.com/en/)

#### **LAI Games**

[www.laigames.com](http://www.laigames.com) 1-469-521-7000



## Vendor Log

### Arcade Game Manufacturers

#### **Raw Thrills/Play Mechanix**

[www.rawthrills.com](http://www.rawthrills.com)

1-847-679-8373

#### **Sega**

[www.segaarcade.com](http://www.segaarcade.com)

1-847-364-9787

#### **Skeeball**

[www.skeeball.com](http://www.skeeball.com)

1-920-822-1496

#### **Smart Industries**

[www.smartind.com](http://www.smartind.com)

1-800-553-2442

#### **Stern Pinball**

[www.sternpinball.com](http://www.sternpinball.com)

1-800-542-5377

#### **Team Play**

[www.teamplayinc.com](http://www.teamplayinc.com)

1-847-952-7533

#### **Triotech**

[www.trio-tech.com](http://www.trio-tech.com)

1-450-760-9082

#### **UNIS**

[www.unistechnology.com](http://www.unistechnology.com)

1-936-662-8733

#### **Valley/Dynamo**

[www.valley-dynamo.com](http://www.valley-dynamo.com)

1-972-595-5300



## **Vendor Log**

### **Arcade Game Providers**

**Betson Enterprises**

[www.betson.com](http://www.betson.com)

1-800-524-2343

**BMI Gaming**

[www.bmigaming.com](http://www.bmigaming.com)

1-866-527-1362

**Moss Distributing**

[www.mossdistributing.com](http://www.mossdistributing.com)

1-515-266-6422

**Player 1 Amusement Group**

[www.winwithp1ag.com](http://www.winwithp1ag.com)

1-416-251-2122

**Primetime Amusements**

[www.primetimeamusements.com](http://www.primetimeamusements.com)

1-800-550-0090

**Shaffer Distributing**

[www.shafferdistributing.com](http://www.shafferdistributing.com)

1-800-282-0194

These are a few companies that offer games from most manufacturers. Each manufacturer provides games as well. Please refer to the manufacturer vendor log for a list of individual manufacturers.



## **Vendor Log**

### **Redemption Suppliers**

#### **A&A Global**

[www.aaglobal.com](http://www.aaglobal.com) 1-800-638-6000

#### **BMI Merchandise**

[www.bmimerchandise.com](http://www.bmimerchandise.com) 1-732-363-0212

#### **Fun Express**

[www.funexpress.com](http://www.funexpress.com) 1-800-875-8494

#### **Redemption Plus**

[www.redemptionplus.com](http://www.redemptionplus.com) 1-888-564-7587

#### **Rhode Island Novelty**

[www.rinovelty.com](http://www.rinovelty.com) 1-800-528-5599

#### **The Toy Factory**

[shop.thetoyfactory.biz](http://shop.thetoyfactory.biz) 1-210-662-4888

#### **Amazon**

[www.amazon.com](http://www.amazon.com)

#### **Wal-Mart**

[www.walmart.com](http://www.walmart.com)

#### **Sam's**

[www.samsclub.com](http://www.samsclub.com)

#### **Costco**

[www.costco.com](http://www.costco.com)



**Example Lists**



**Arcade Deep Cleaning Schedule**

Center Name: \_\_\_\_\_

Week 1 Date _____			Week 2 Date _____		
Day	Game	Initials	Day	Game	Initials
Monday			Monday		
Tuesday			Tuesday		
Wednesday			Wednesday		
Thursday			Thursday		



## Example Lists

### Daily

- Check out of service log
- Walk the game floor
- Redemption walkthrough
- Balance balls/bean bags/etc. in all games that require this
- Check for trash/spills/drink rings/etc. around the floor, on tables, & on games
- Empty card set machine (some centers may not have this)
- Check card/paper levels in all tellers
- Restock cranes/ticket rolls/pushers/etc.
- Restock & organize redemption area
- Deep clean assigned games on deep cleaning checklist
- Clean glass on all games

### Weekly

- Place redemption order
- Game button check
- Empty silver coin catch trays/areas on coin pushers
- Check operation of every game
- Check lights on every game
- Steering wheel check
- Wipe down all table bases
- Calibrate all shooter games
- Deep clean trash cans (coordinate with the rest of the venue to do all at once)

### Monthly

- Inventory
- Cosmetic game check (trim, stickers, plastic, etc.)
- Check all tables & chairs for issues (document or repair)
- Check for gum on the floor (document or remove)
- Wear & tear check (handles, mallets, basketball nets, etc.)
- Speaker & volume check (to low, to loud, speaker blown?)
- Clean filters on water games







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**Thank you to FIRST FRAME BOWLING for  
sponsoring this training and RAIN FOREST  
BLACK LIGHT GOLF & ARCADE for being  
the host center!**

**To become a sponsor or host center,  
please email Mike Monroe at  
Mikebowl44@gmail.com**

**Thank you all for attending!!!!**

