NO GOOD GOFERS
Battle For The Green

**new code for your No Good Gofers pinball machine
by
Cardona Pinball Designs**

MANUAL VERSION 20221231

WARRANTY STATEMENT

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CUSTOMER SUPPORT STATEMENT

The kit is meant to be installed by pinball professionals and then this should be your first resource for questions.

In the case you have other questions concerning game play, rules, or options menus, the best thing is to post a question to the NGG2.0 thread on pinside.com. https://pinside.com/pinball/forum/topic/ngg20-new-code-for-your-no-good-gofers-2020

Answers posted there will be available to everyone then. Additionally, you may find the videos on my youtube channel instructive: https://www.youtube.com/channel/UCIfaYT1NUJl5ebAzYroUGyw

If you do not find your answer there, please send us an email and we will try to help you through your problem. Tech@CardonaPinball.com

KIT CONTENTS

Included in the box:

- Speaker panel with two speakers, an LCD screen, and associated wiring
- Mounting panel containing game CPU, FAST audio controller, circuitry, and associated wiring
- FAST controller board

LICENSE STATEMENT

No Good Gofers: Battle For The Green features the ability to play the original game code for the No Good Gofers pinball machine and is licensed through Planetary Pinball Supply. Your proof of authenticity is a PPS hologram seal and CPD serial number located on the No Good Gofers: Battle For The Green CPU.

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INSTALLATION

WARNING

CONNECTING OR DISCONNECTING POWER, AUDIO, OR VIDEO CABLES WHILE MACHINE IS ENERGIZED CAN CAUSE VOLTAGE SPIKES AND DESTROY VIDEO OR AUDIO CHANNELS.

The No Good Gofers: Battle For The Green kit is designed to be installed by a pinball professional. Additionally, the kit is designed to be installed into a fully functional No Good Gophers pinball machine that has no pre-existing errors or faults. If your machine has pre-existing problems, switch errors, faulty coils, or blows fuses then please fix all errors and problems prior to installing the No Good Gofers: Battle For The Green kit.

Check our youtube channel for installation videos. Check the quick installation guide for step-by-step pictures. Links can be found at **cardonapinball.com**

WARNING
DANGER OF ELECTRIC SHOCK OR EQUIPMENT DESTRUCTION IF SERVICE OUTLET IS NOT PROPERLY WIRED AND PHASED

◆ POWER DOWN the machine and UNPLUG the game from the outlet.

◆ OPEN the back box and REMOVE the following:
  ◆ CPU board (label the connectors before disconnecting!)
  ◆ Audio - Video Board
  ◆ Speaker Panel

◆ MOUNT the FAST controller board in the old WPC CPU board location and PLUG IN all associated connectors.

◆ MOUNT the metal CPU panel in the audio-video board location.

◆ MOUNT the provided power supply panel to the base cabinet and run the power wires up

  to the monitor and the Fast audio board. Also pug the power input into the service outlet.

◆ MOUNT the provided speaker panel.

◆ VERIFY that you actually, really, UNPLUGGED the machine like you were supposed to in the first step.

◆ CONNECT the wires and cables:
  - PLUG the micro USB cord from the metal CPU panel into the top of the FAST controller.
  - PLUG the HDMI cord from the metal CPU panel to the monitor on the speaker panel
  - PLUG the audio output cord from the monitor to the FAST audio board on the metal CPU panel
  - CONNECT the speaker wires on the speaker panel to the FAST audio board on the metal CPU panel
  - CONNECT the existing subwoofer wires to the FAST audio board on the metal CPU panel. ENSURE proper polarity.
  - Connect the power wires from the power board to the monitor - this is a barrel

connector.
- Connect the power input wires from the power board to the FAST audio board - this is a IDC connector.
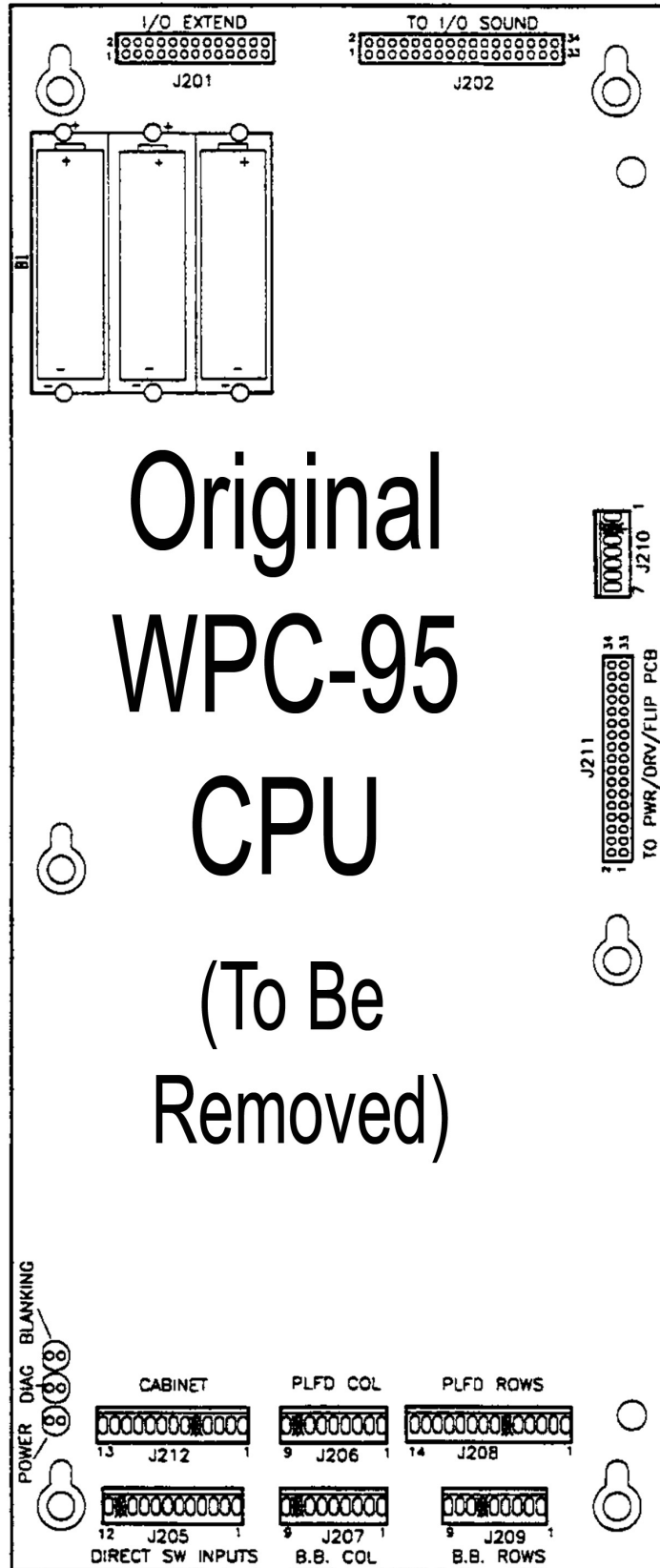- Plug the ethernet cord on the FAST audio board into one of the available ethernet ports on the FAST controller.

◆ PLUG in the machine

◆ POWER UP the game

Once the game is booted up, please note that you may need to adjust coil strengths for some of the coils of your machine if your outlet power is too low or too high, or if, perhaps, your machine is slightly different that our test machines. The default settings should work for the majority of installations, however, to adjust coil strengths, please see the settings menu section of this guide. Pay particular attention to the slam ramp.
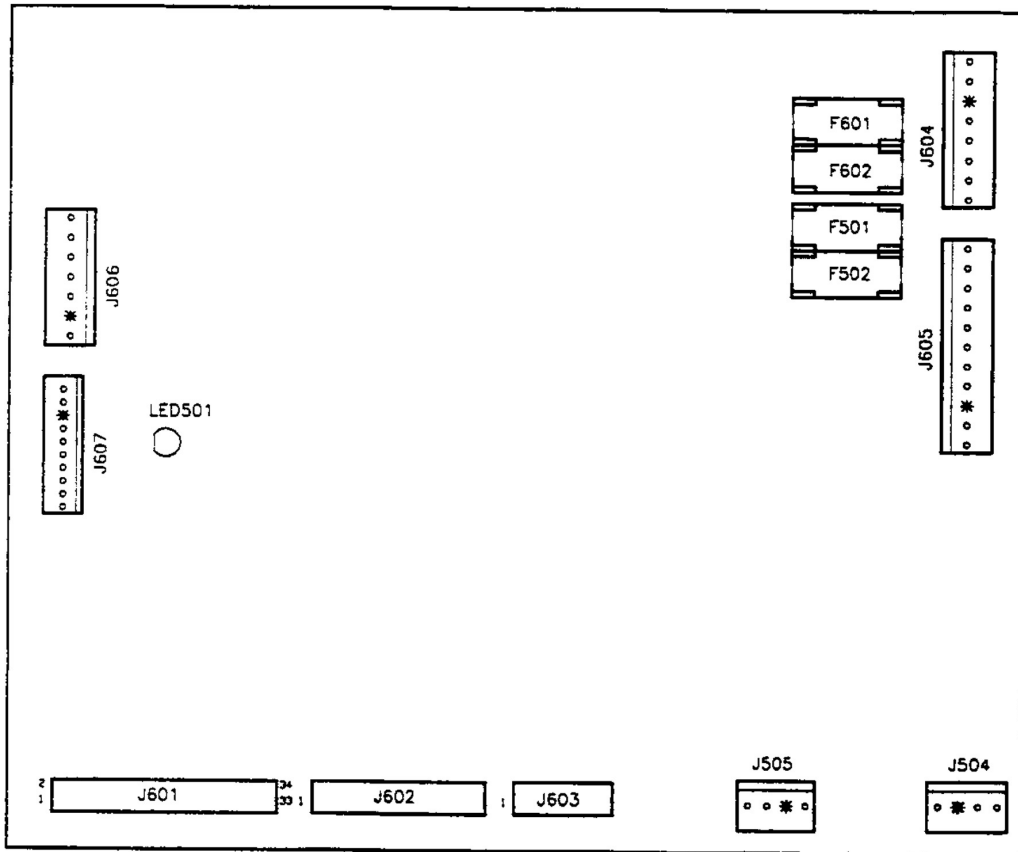
This should not be considered a substitute for replacing old and weak coils. Please be cautious and deliberate if changing coil settings as a power setting that is too high can tend to fire coils too hard and thus, break things. Additionally, coils energized longer will heat more.
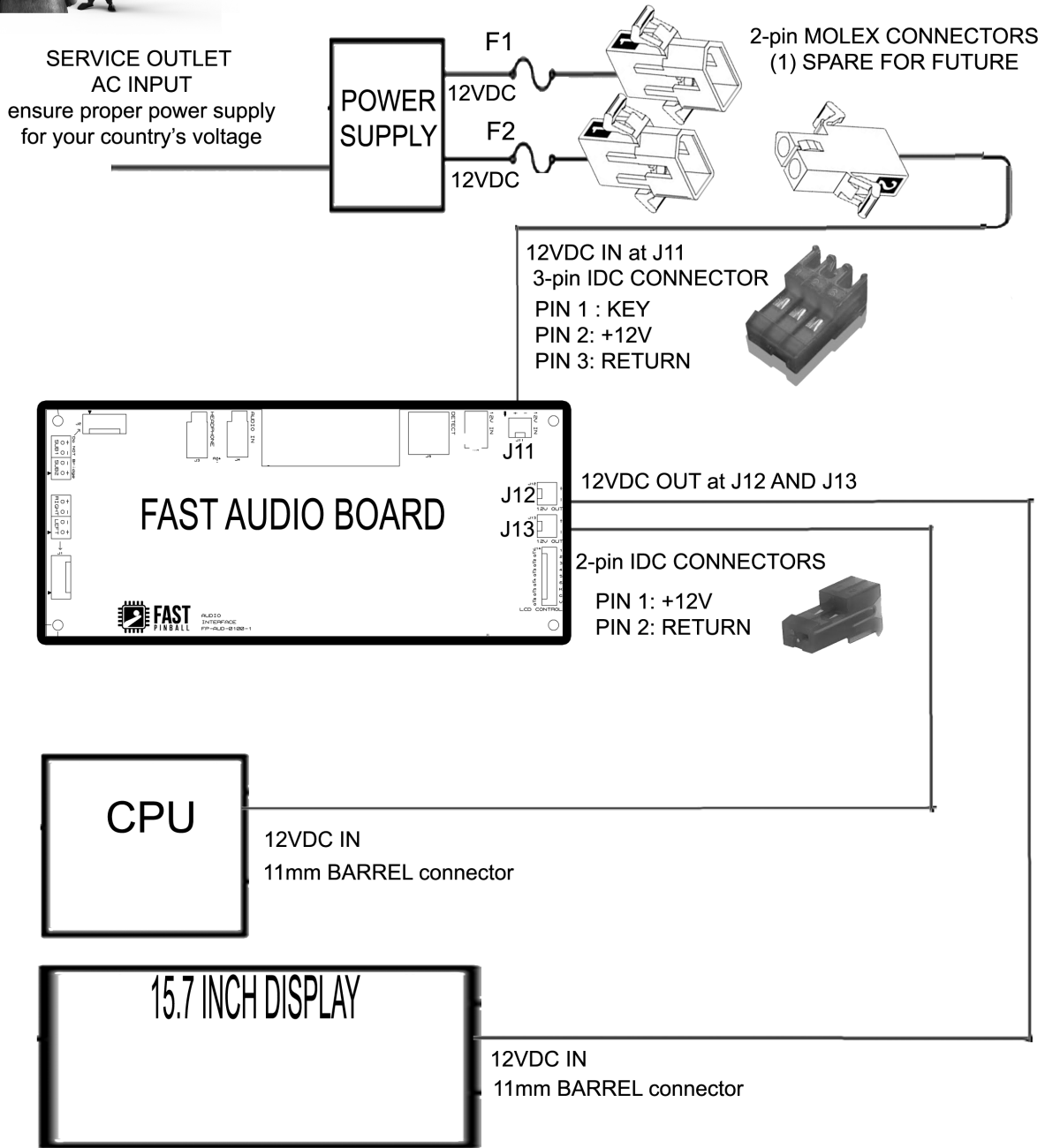
Best practices and pitfalls for the installation

◆   The USB cord that runs from the CPU to the FAST controller board can pick up magnetic interference if it is run adjacent to power wiring. It is recommended to run this cord across the top of the back box vice across the middle where all the wire bundles are located. A tie wrap base or other cable bundle securing device can be attached to the top of the back box to hold the USB cord.

◆   The power cable that runs from the bottom cabinet to the backbox and should not have any strain on it and be routed in such a way that raising and lowering the play field does not snag this cable. Please tie wrap the cable to the existing wire bundle behind the play field and also wrap the power cable around the existing plastic cable guides so there is no strain placed on the connector where it plugs into the device.

◆   The power supply has a voltage adjustment potentiometer that adjusts the output of the power supply. This should be set at about 12.5 VDC as read at the destination connectors and under load. It is set at the factory, but if the CPU randomly reboots or does not boot at all then this is likely the cause. Do NOT adjust this potentiometer without a meter to measure your changes.

I/O EXTEND
J201

TO I/O SOUND
J202

B1

Original WPC-95 CPU

(To Be Removed)

J210

J211   TO PWR/DRV/FLIP PCB

POWER   DIAG   BLANKING

CABINET
13   J212   1

PLFD COL
9   J206   1

PLFD ROWS
14   J208   1

12   J205
DIRECT SW INPUTS

J207   1
B.B. COL

J209   1
B.B. ROWS

Audio Visual Board Assembly
A-20516-50061

F601
F602

J604

F501
F502

J605

J606

J607

LED501

J505

J504

J601

J602

J603

Original WPC-95 audio-visual board (To Be Removed)

No Good Gofers
Battle For The Green

SERVICE OUTLET
AC INPUT
ensure proper power supply
for your country's voltage

POWER SUPPLY

F1
12VDC

F2
12VDC

2-pin MOLEX CONNECTORS
(1) SPARE FOR FUTURE

12VDC IN at J11
3-pin IDC CONNECTOR

PIN 1 : KEY
PIN 2: +12V
PIN 3: RETURN

FAST AUDIO BOARD

J11

J12   12VDC OUT at J12 AND J13

J13

2-pin IDC CONNECTORS

PIN 1: +12V
PIN 2: RETURN

CPU

12VDC IN
11mm BARREL connector

15.7 INCH DISPLAY

12VDC IN
11mm BARREL connector

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MONITOR ON
SPEAKER PANEL

DC Power	HDMI	DVI In	PC-RGB	PC	Earphone
Supply	In		In	Audio In	Out
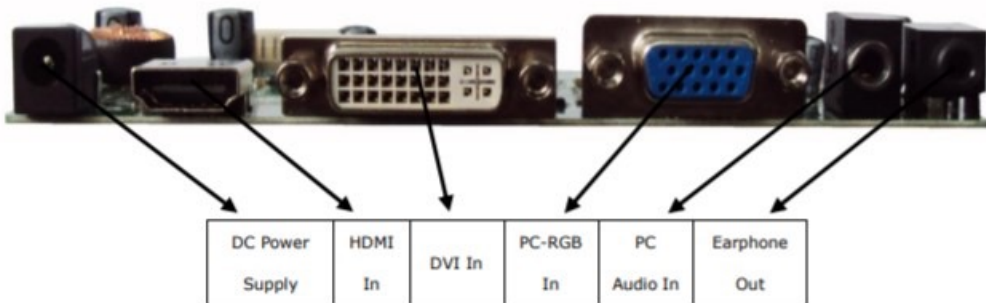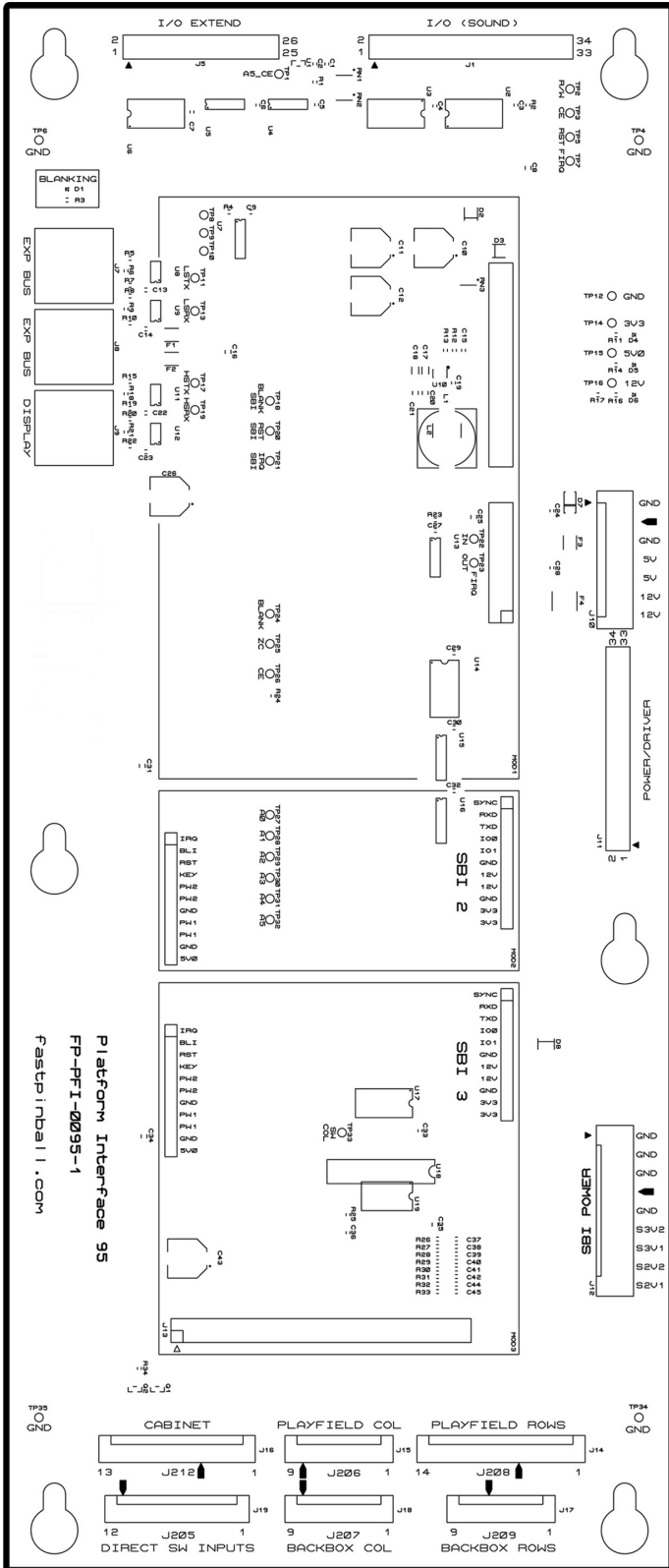
FAST
PINBALL

FAST WPC-95 CONTROLLER

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No Good Gofers
Battle For The Green
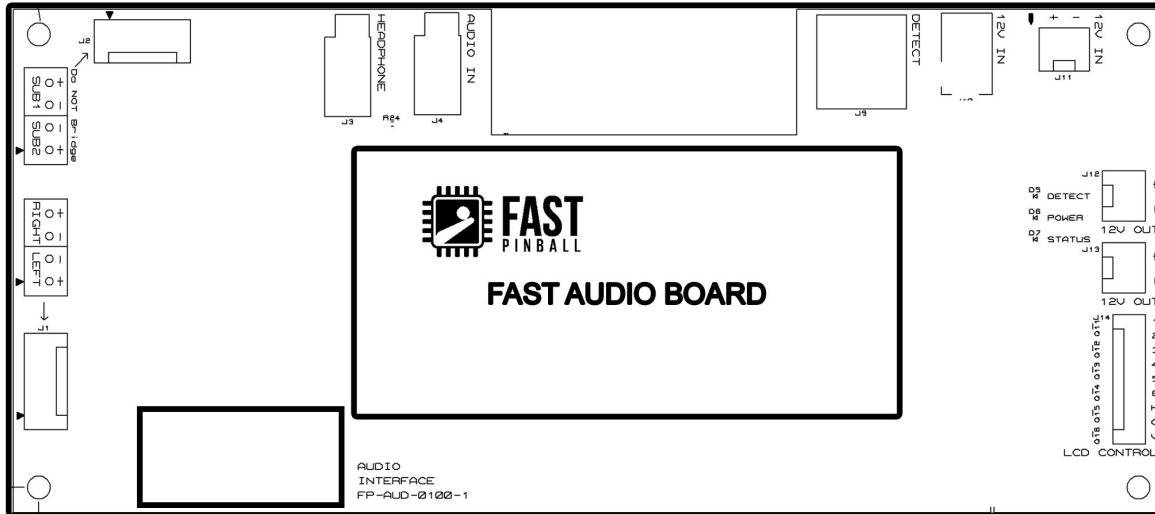
FAST AUDIO BOARD

FAST AUDIO BOARD

AUX-8 BOARD

NUC CPU

FAST CONTROLLER

POWER DRIVER BOARD

DISPLAY PANEL

PREVIOUS SCORES
Player 1   7,506,281
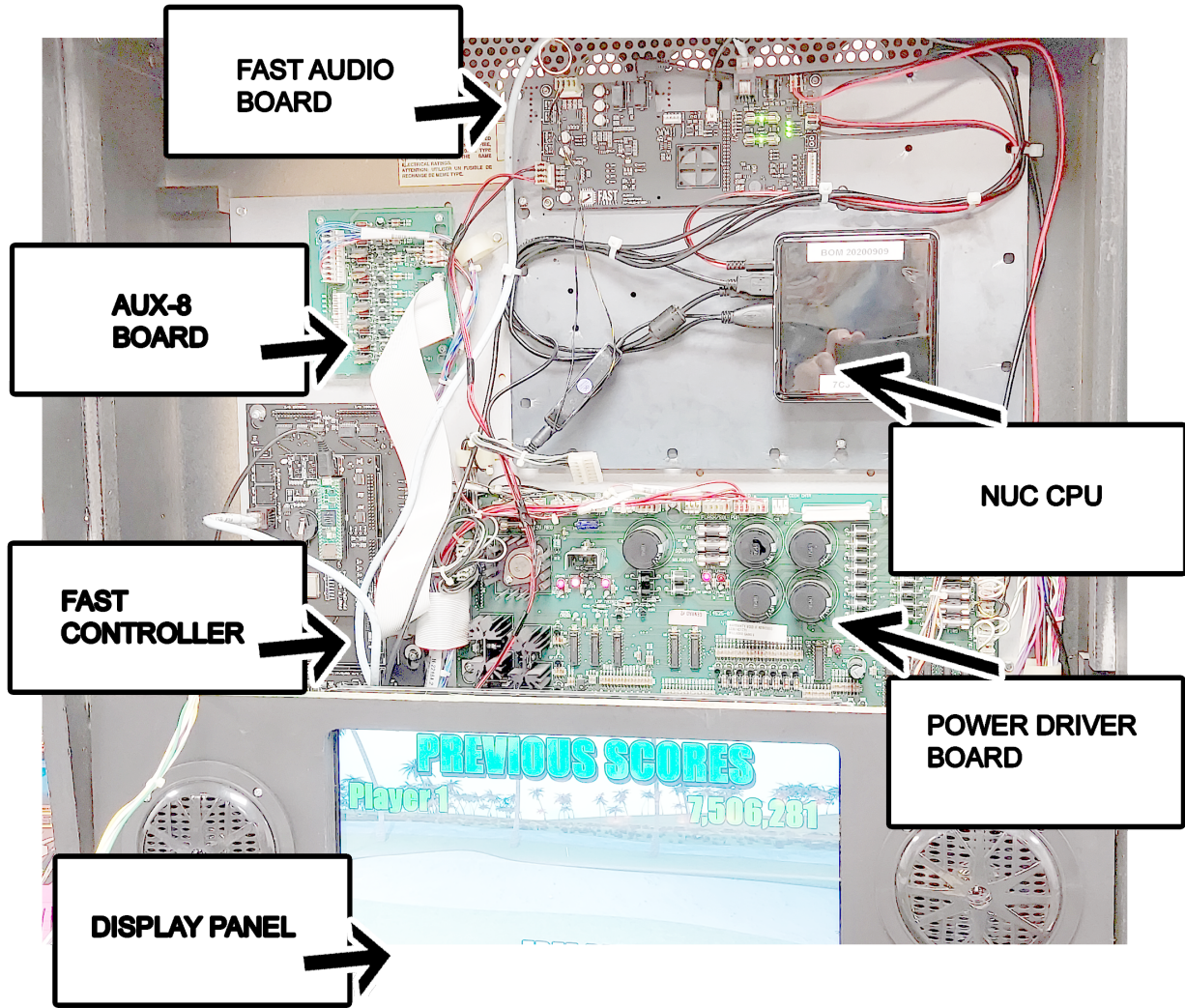
NGG KIT (INSTALLED)

No Good Gofers
Battle For The Green

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MICRO USB
TO NUC CPU

MACHINE POWER

RJ45 TO FAST
AUDIO BOARD

DATA CABLE TO
POWER DRIVER
BOARD

SWITCH MATRIX
FROM PLAYFIELD
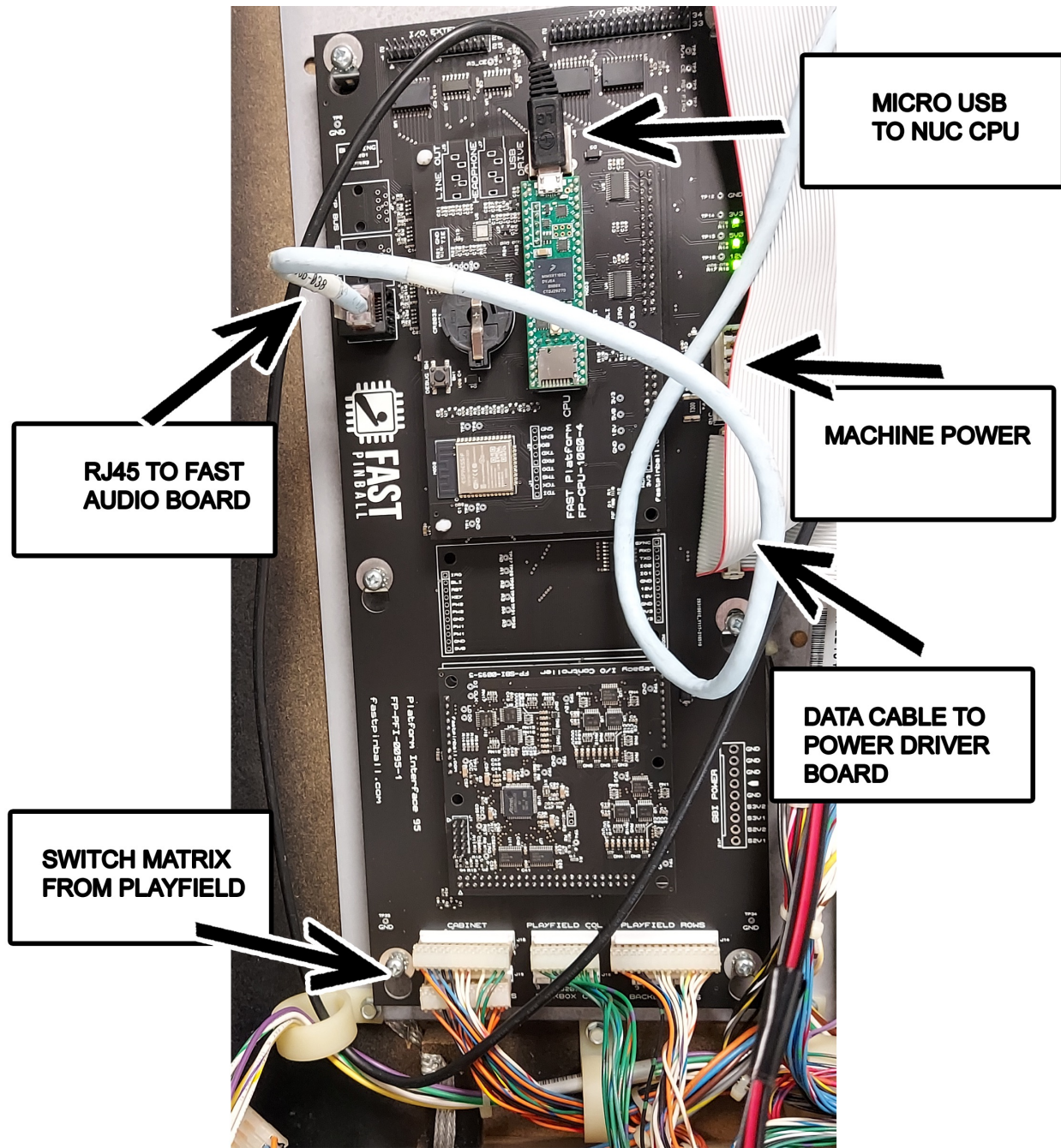
FAST WPC-95 CONTROLLER REV1 (INSTALLED)

RJ45 TO FAST AUDIO BOARD

MICRO USB TO NUC CPU

SWITCH MATRIX FROM PLAYFIELD
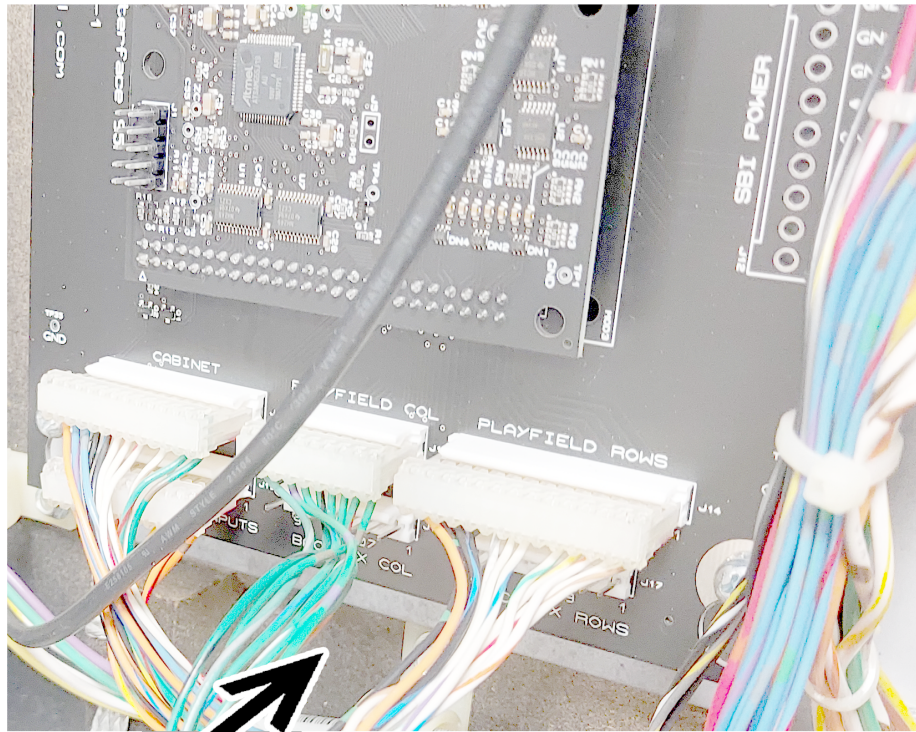
MACHINE POWER

DATA CABLE TO POWER DRIVER BOARD
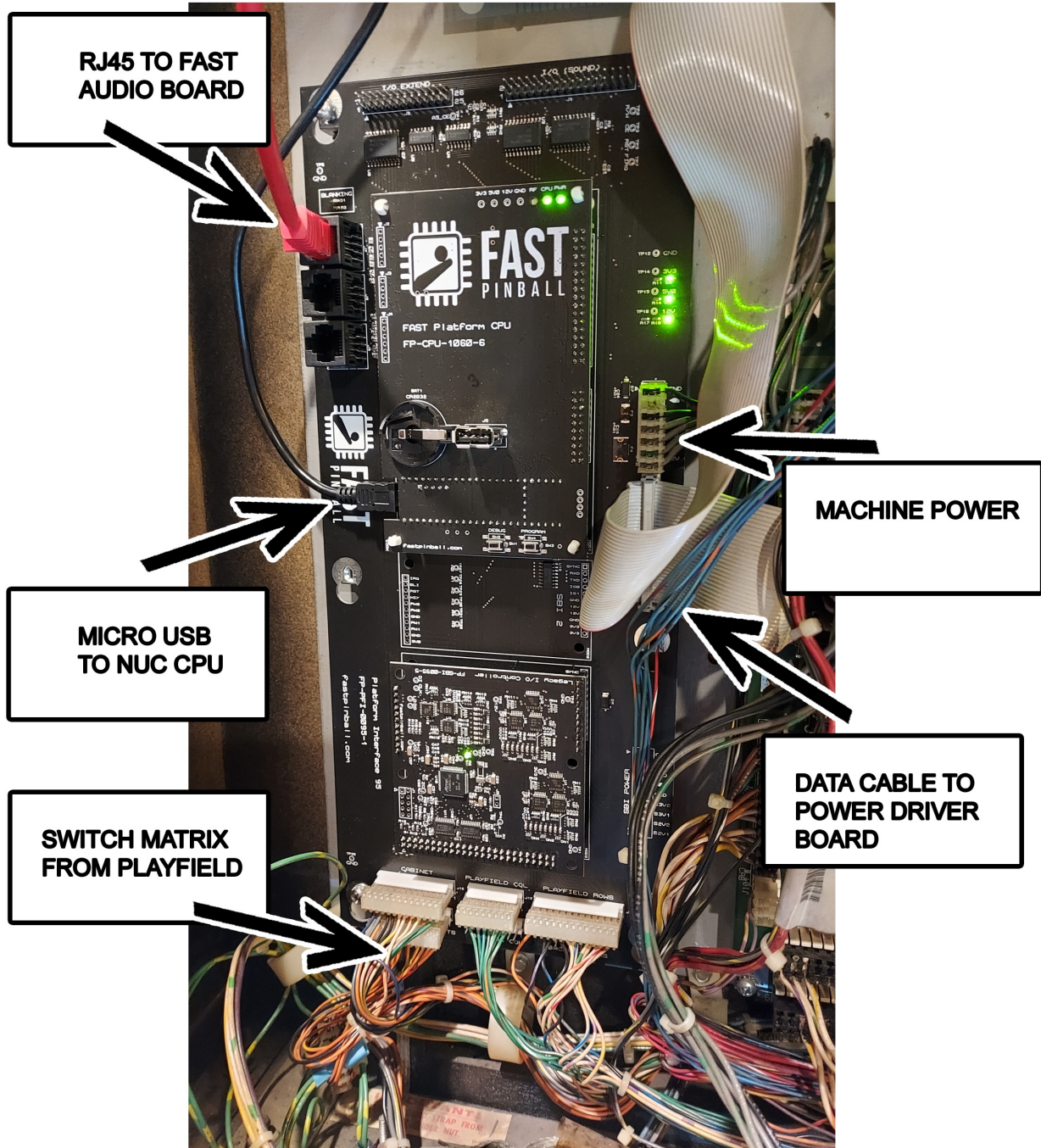
FAST WPC-95 CONTROLLER REV2 (INSTALLED)

No Good Gofers
Battle For The Green

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**SWITCH MATRIX
FROM PLAYFIELD**

FAST WPC-95 CONTROLLER (INSTALLED)

FAST AUDIO BOARD
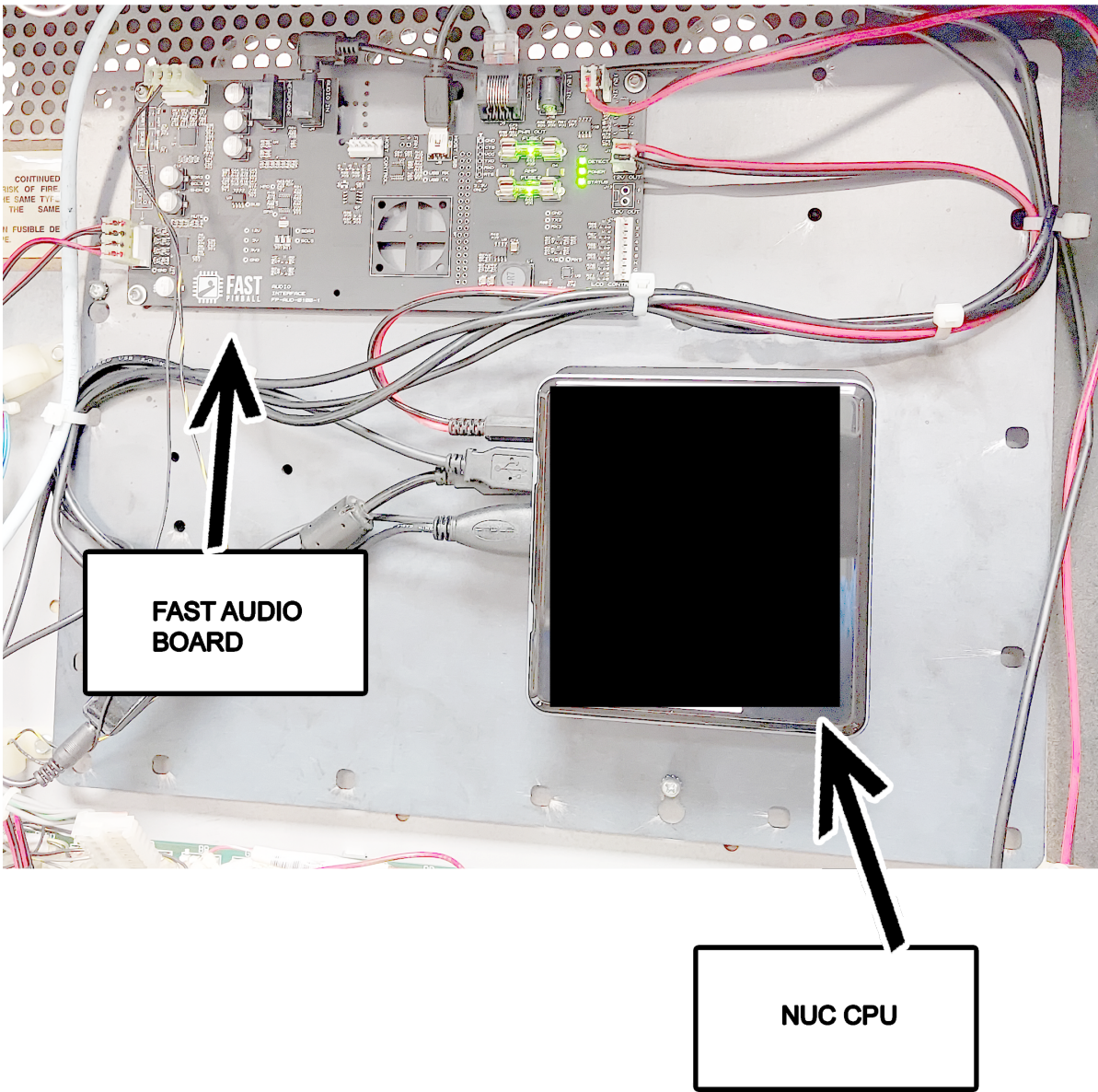
NUC CPU

FAST AUDIO BOARD AND
NUC CPU (INSTALLED)

SUBWOOFER CONNECTION

AUDIO IN FROM MONITOR

RJ45 FROM FAST CONTROLLER

MINI USB FROM NUC CPU

POWER IN

BACKBOX SPEAKER CONNECTION

POWER OUT TO NUC CPU AND DISPLAY
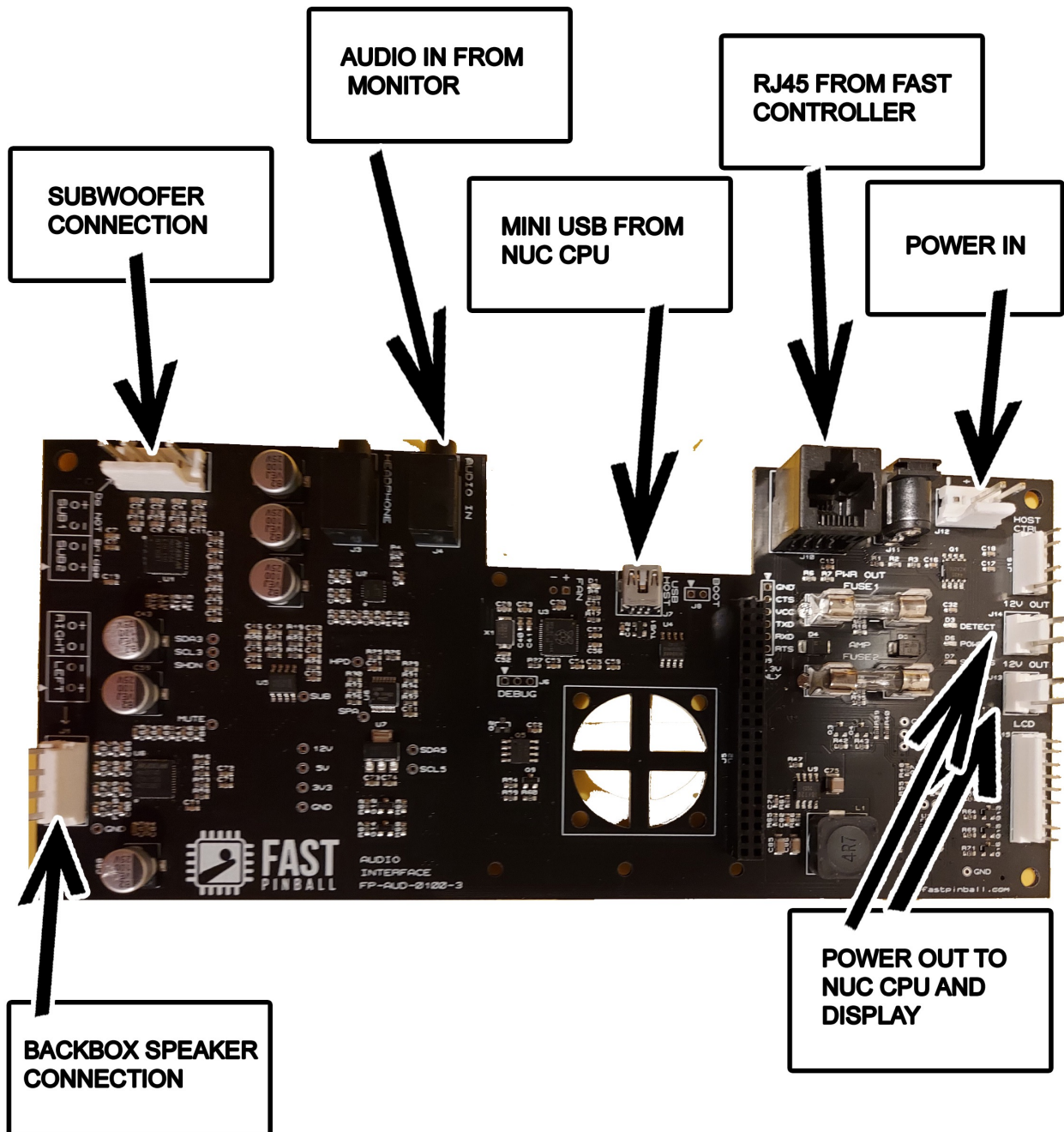
FAST AUDIO BOARD CONNECTIONS

No Good Gofers
Battle For The Green

Cardona Pinball Designs
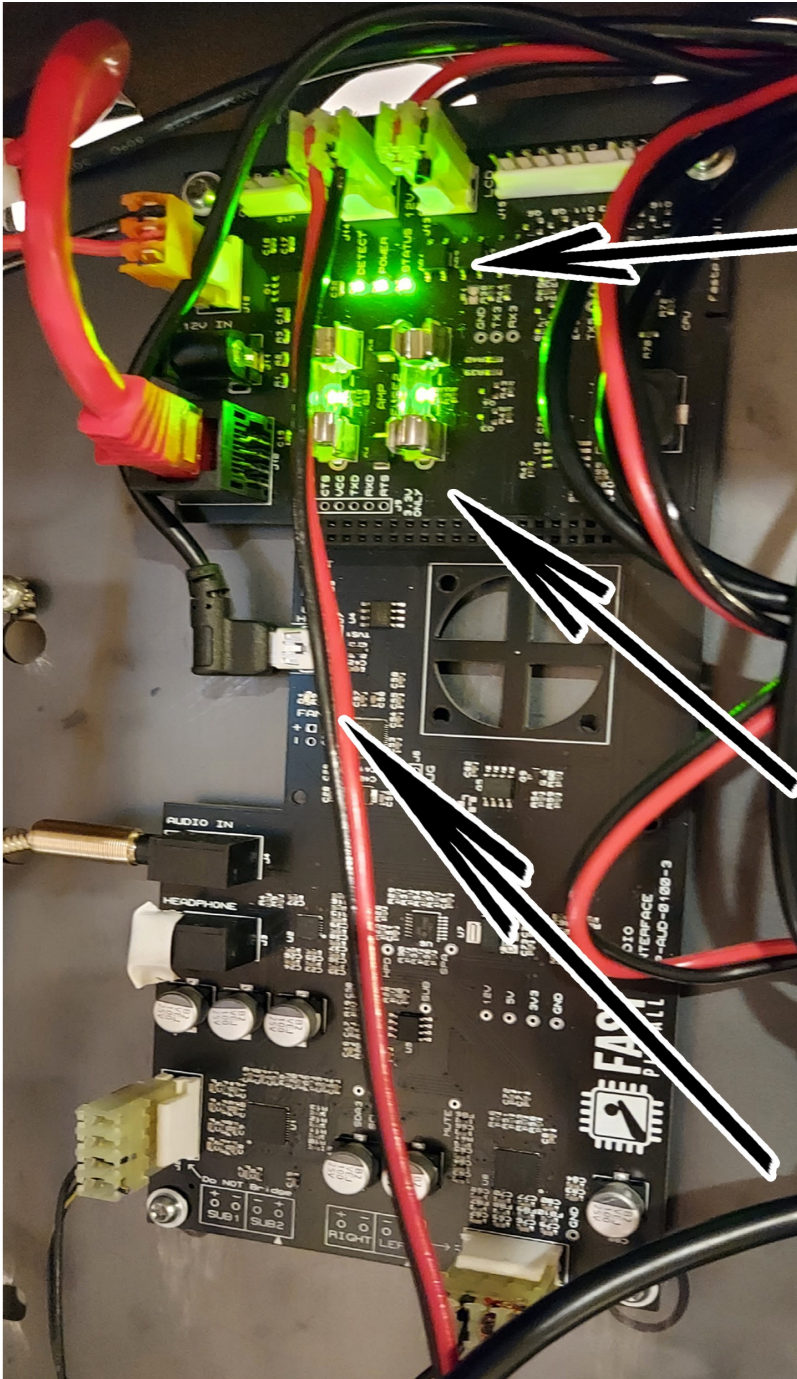
STATUS LEDs (3)

1 DETECT
lit if power detected at
RJ45 plug (game on)

2 POWER
lit if power is coming in
from cabinet power
supply to J11
(plugged in)

3 STATUS
blinks when system is
turned on

**FUSE LEDs for J12 and
J13 outputs**

lit if fuse is good
(continuity)

USB activity LED

lit when CPU is
communicating with the
audio board
(changing volume)

FAST AUDIO BOARD LEDs

No Good Gofers
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LOADER DESCRIPTION

After the system boots up, the game will automatically load into the No Good Gofers: Battle For The Green attract sequence. If the player wants to play the original versions of No Good Gofers then this option must be turned on in the settings menu.

Once the playing of the original game is enabled in the settings menu, from the attract sequence simply hold the start button down for about 5 seconds to open the game loader menu. The loader screen allows the player to choose which game to play.
- No Good Gofers: Battle For The Green
- No Good Gofers version 1.3 (Williams 1997)

No Good Gofers: Battle For The Green is a completely new and different version of the game using modern video, sound, and animation. The description of No Good Gofers: Battle For The Green is in the next section of the manual.

The original version of No Good Gofers was released in 1997 by the Williams Electronic Games company (WEG) and its use is licensed through Planetary Pinball Supply (PPS).
No Good Gofers: version 1.3 was the final released version by WEG.

In the loader, press the flipper buttons to navigate the menu and press the start button to choose which game you want to play. Once you are in the original version of the game, it will remain in that game until the player intentionally exits by turning the game off. When the game is restarted, it will again begin with No Good Gofers: Battle For The Green.

No Good Gofers

Battle For The Green

OVERVIEW

No Good Gofers: Battle For The Green has a balanced scoring system divided into two different main objectives: completing holes, that is to say 'golfing', and mini-games (mini-modes). Additionally, there are two wizard modes. One wizard mode is enabled after completing 18 holes of golfing and the other wizard mode is enabled after completing all of the mini-modes. So then, each main objective has its own wizard mode.

For golfing, the player hits strokes which advance the ball to the green. Once on the green the player putts out and receives an award based on how far under or over par the player is for that particular hole.

To complete a mini-mode, the player must not only start the mode but also shoot the required mode shots enough times to complete it. Each mode is explained in detail below.

The golfing and mini-mode goals can be worked on independently or simultaneously in that progress toward the individual goals are separate. However, once a mode is started you will work on the modes goals independent of the others until the mode is finished. Additionally, modes cannot be stacked, that is, you cannot run several modes simultaneously.

In No Good Gofers: Battle For The Green modes are chosen randomly, so when mode start is achieved the player does not choose which mode is played. Once the mode is completed by hitting all the required strokes, gophers, flashing lights, etc., the completed mode will not be available to play again until after all modes are completed and the final Sorcerer mode is played (more on that later).

Additionally, completing a mode will increase all the associated point values by 2x. Completing all the shots a second time will increase the value to 3x. This is the highest multiple that can be achieved.

There are other ways to increase a shots value such as earning 2x or higher by completing cart path loops. Again, more on that later.

THEME

A bear wanders onto a golf course and loses his memory when hit by an errant ball. Buzz, a gopher that hates all golfers, discovers the bear, names him Bud, and convinces him that he's really a gopher too. With Bud's raw strength, Buzz hatches a plan to take the golfers out and reclaim the course as his own.

The music, animations, voice work, and sound effects follow this comical and cartoon-ish vein and were made to be accessible to all. There is no profanity in No Good Gofers: Battle For The Green, however, just like the original, Buzz tends to be critical and confrontational of the player's shots and says things like "miss it," "hey hotshot," "get off our turf," or "you're holding your putter wrong," and will most certainly laugh when the player drains.

Bud, on the other hand, is the comic relief of the team. He's a bear that thinks he's really an oversized gopher. Let's just say he's a little slow on the uptake.

COMPLETING HOLES

One facet of No Good Gofers: Battle For The Green is completing holes, that is to say golfing. In the real-world game of golf, the lowest stroke count is best.

In the original pinball game of No Good Gofers this idea was turned on its head; the player started with 7 or so strokes and each shot lowered the stroke count. So then, in the original game the *more* shots that were made improved the stroke count and scored more points. Instead, we wanted to make golfing on No Good Gofers: Battle For The Green more like real-world golfing.

So instead of counting down strokes from 7 by hitting drives as in the original code, drives are more like real golf in that the stroke count goes up instead of down. Each hole has a 'par value' and 'distance to the hole' and thus requires a certain number of shots to get to the putting green. The par value and distance to hole value along with the player's current stroke count are shown at the top of the display screen.

If a combination of drive shots is made the ball will go farther thus allowing the player to be "under par" for that hole. Being under par will yield higher bonus points at putt out (and end of ball bonus). Thus, combo shots are key.

Each drive shot counts as a single stroke and moves the ball 100 yards closer to the green. A combo shot will move the ball 100 yards without taking a stroke. So for example, 3 combo shots in a row will move the ball 300 yards but only count as a single stroke. As you can imagine hitting enough combo shots in a row could put the ball all the way to the green but only cost a single stroke. Putting out also counts as a stroke, obviously, so without hitting a hole-in-one the best possible stroke count is two.

Another key thing to know about the golfing portion of the game is that the end-of-hole-bonus is based on the player's under-or-over-par value, not the number of strokes as in the original 1997 game. In order to make the game more rewarding, earlier holes have a lower par value and later holes have a higher par value. In this way, later holes will allow for higher scores because a good player will be able to complete the hole being further under par. Here is a listing of the shots for completing holes:

Shots that do not count:
- Unlit drive shots do not add to stroke count or advance the ball.
- Hitting gophers do not add to stroke count or advance the ball.
- Hitting the golf cart does not add a stroke or advance the ball.

Good shots:
- Lit drive shots hit once count as a single stroke and advances the ball 100 yards.
- Lit drive shots hit more than once in series (combo) count as a single stroke and advances the ball 100 yards multiplied by the number of shots made in a row. For example, if 3 drives shots were made in succession, it would count as a single stroke and advance the ball 300 yards.
- Putting out counts as a single stroke and ends the hole.

Bad shots:
- If the ball is on the putting green (putt out lit) and the player hits a drive instead of putting out then that adds one to stroke count, but the ball stays on the green.
- Hitting the putting green before putt out is lit is considered a water hazard shot and adds one stroke but does not advance the ball.
- Ball landing in the sand trap adds one stroke but does not advance the ball.

Kind-of bad shots:
- If a slam ramp shot misses the cart and hole-in-1, but still makes it to left ramp it is a "slice". If it goes to the right, it is a "hook". Forward the ball 100 yards, and increase shot count by 1, but do not allow a combo for next drive shot.

One of the key differences in making a good score during the golfing phase of the game as opposed to mini-modes is that the end of ball bonus reviews the player's scorecard and awards a hole bonus at the end of each and every ball.

For example, let's say the player scores a few combos such that he or she is under par on a hole for ball one and receives an under par bonus of 500,000. The player would receive an additional 500,000 at the end of ball bonus for hole one on ball one. Then again at end of ball bonus for ball two and again for ball three, for a total of 2 million for the entire game just for completing that one hole. So then, the player receives the bonus four times (assuming a 3-ball game).

If the same circumstances occurred on ball three, only the ball three bonus would credit an additional score and thus only 1 million points. Some smart players might want to focus, then, on completing holes earlier, rather than later in the game.

One exception to all of the above is the hole-in-1 shot which awards a set bonus at the end-of-ball-bonus regardless of the par value for that particular hole. This was done to avoid having the weight of a hole-in-one shot be too large.

Golfing Example:
Hole 1 is a par 4 and 300 yards to the green. The golfer could hit:
- Hole-in-one –regardless of current stroke count, count as a single stroke and end hole. Hole-in-one will always grant a set bonus at putt out, regardless of under par number and the end-of-ball bonus will also be a set bonus.
- Shoot a non-combo drive 3 times, receive 3 strokes, then putt out to make par.
- Shoot a combination of normal drives or combo drives and putt out for either a 2 or 1 under par.
- Drive to green, then do not putt out, hit additional strokes, water hazards, or sand traps to go over par. Once 7 strokes are achieved, the ball will automatically be put on the green, by the way. However is it possible to continue to hit sand traps or strokes and have a stroke count above 7.

WHEEL AWARDS

In the original game, putting out not only yielded the hole count score and advanced the ball to the next hole, but also started either a specific mode tied to a hole such as hole-in-one challenge at hole 9 or awarded the wheel value, which could also be a mode/mini-game.

In No Good Gofers: Battle For The Green, the ability to start most of the mini-games/ modes from putt out is eliminated (such as speed golf, dance party or pop-a-gopher), however, other wheel awards will still be given. Most of the mini-games/modes will be a separate facet of the game and described in a later section. The exception to the above is Super Jets and Big Spinners, which can be started by a putt out award.

Available wheel awards:
- •   Light special at right outlane
- •   Warp (advance 1 hole with identical stroke count)
- •   Light extra ball at left outlane (but not at putt out)
- •   Start Super Jets for 30 seconds
- •   Start Big Spinners for 30 seconds
- •   Add 1 to Kickback stack

CART PATHS (LOOPS)

Cart path shots increase both the in-game score and the bonus multiplier but with multiple exceptions. All mini-modes do NOT multiply scores with 2X, 3X, 4X and so on, with the exception of Speed Golf. All under par bonuses at the end-of-ball do NOT multiply scores with 2X, 3X, 4X and so on, however, they do multiply at putt out.

The player must hit several cart paths to go from 1x to 2x to 3x and so on, not just a single hit. To get cart paths lit, you have to hit the skill shot targets, which is a pretty good change, I think, since in the old game those targets weren't used for much besides the skill shot.

To aid the player in achieving 2x, 3x, and so on, the flow of shots are the only targets that blink during the base game. The flow is as follows: hit the skillshot targets to light the inlanes, then hit the inlanes to light either the left or right the cart path. Shoot the lit cart path shot from left to right or right to left accordingly to increase the multiplier light at the bottom of the playfield. So, in effect, you need 3 shots to get a single cart path and you will need more than one cart paths to get to 2x, 3x, 4x scoring and so on.

Unfortunately, there are no separate lights for these targets so this is another reason why they flash. The skill shot lights point at the skill shot targets and are lit solid for skill shot and blink for the cart path permissive.

Likewise, the lower slam ramp light near the left inlanes is lit solid when it is a permissive to lower the slam ramp, but blinks when it is being used for a cart path permissive. The cart path light, which is an unlabeled circle, also blinks.

On ball start and just after the skill shot is over, one of the cart paths will be lit. Shoot the loop to get your first cart path. After that, the skill shot target will flash and so on as above. Shoot the appropriate 3 shots to get your second cart path.

- 2 cart paths => light 2X
  - 3 cart paths => light 2X and cart path 2X
  - 6 cart paths => light 3X and cart path 2X
  - 7 cart paths => light 3X and cart path 4X
  - 9 cart paths => light 4X and cart path 4X
  - 10 cart paths => light 4X and cart path 5X

Some of you analytical types are asking, 'if you hit a cart path shot, do you get both?' and the answer is yes.

Example:

No multipliers lit => cart path shot is worth 35,000

2X multipliers lit => all shots doubled, cart path shot is worth 70,000

2X and cart path 2X lit => all shots doubled, cart path shot is worth 140,000

3X and cart path 2X lit => all shots tripled, cart path shot is worth 210,000

3X and cart path 4X lit => all shots tripled, cart path shot is worth 420,000

4X and cart path 4X lit => all shots quadrupled, cart path shot is worth 560,000

4X and cart path 5X lit => all shots quadrupled, cart path shot is worth 700,000

EXTRA BALLS

Extra balls were super easy in the original game and we changed that with No Good Gofers: Battle For The Green for a few reasons, including the fact that they are typically turned off during tournaments. For No Good Gofers: Battle For The Green, extra ball can only be lit by a random wheel award during putt out and it lights only the left outlane (drain) not the putt out extra ball light.

If extra balls are turned off, or if the player has already achieved the extra ball limit set in the settings, extra ball will award 2 million points.

One thing to note is that the two outlane awards, extra ball and special, will swap each time a sling is hit.

KICKBACK

Shoot all of the kick lights and then the upper kick target to add 1 stack of kickback. Kickbacks can be stacked. If the ball drains to the left side drain, a coil will fire to launch the ball back on the playfield, consuming 1 stack of kickback. On most difficulties, the game starts with a single stack of kickback already loaded. Kickbacks carry over from ball to ball.

SUPER JETS

Bud is flying in formation! How did he get in that plane!

Super Jets is started by hitting a certain amount of jets or by the wheel award on putt out. During Super Jets all jets hits award big points. Additionally, water hazard is turned off and all putting green shots will send the ball to the jets instead of alternating between jets and firing back at the player. Super Jets do not have a completion value and each successive restart will require more jets hits.

BIG SPINNERS

Bud ate some wild mushrooms and now he doesn't feel so good. The whole world is spinning!

Big Spinners is achieved by hitting a certain amount of spinners or as a putt out award. During Big Spinners all spinners hits award big points. Big Spinners do not have a completion value and each successive restart will require more spinners hits.

SPECIAL

Special is awarded at the right drain so it is something of a consolation prize because you are losing your ball. Special is lit by the random wheel award. Specials do not stack and cannot be awarded during a multi-ball. If special was lit before the multi-ball, it will be available after the multi-ball ends.

If on coin play, scoring a special grants a replay, that is, it adds one credit to the machine. If on freeplay, special scores 2 million points.

One thing to note is that the two outlane awards, extra ball and special, will swap each time a sling is hit.

THE 19TH HOLE MODE

In the original game, there was a 'wizard' mode called hole-in-one challenge which started at putt out of the 9th hole. The 19th Hole is similar but starts after completing 18 holes. It does not start automatically, but is lit after 18 holes are completed. You will still need to make one more shot into the putt out to start the new mode.

The mode is a single-ball-timed mode and many shots are lit for huge points. This is one of two different wizard modes.

LOCKING BALLS, GOPHER MULTIBALL

This was a huge part of the original game and due to its progressive nature, the only thing people who knew the rules of the game would play if they wanted to score a lot of points. It has been removed in its entirety. In No Good Gofers: Battle For The Green, no balls are physically locked, however there are certainly several multi-ball modes, you just don't need to lock balls to start them.

MODES

Different from the original game, instead of starting modes as a wheel award at putt out, modes are started by hitting the gophers or the golf cart a set amount of times. The number of hits required depends upon the difficulty settings in the game in the options menu. Spell B-U-Z-Z with 4 hits to the buzz gopher to light his mode start. On easy difficulty, the game starts with B-U-Z so you only need 1 more hit. On harder difficulties the player has to hit him more times. The same follows for B-U-D and C-A-R-T.

These hits are not cumulative so a bud hit and a buzz hit do not add together. However, you can have more than one counter active at the same time. For example, you can have both BUD lit and BUZZ lit then start two modes in a row. You cannot have two modes running at the same time. Once one mode is finished, you can start the next one right away. All mode starts, except ripoff, are started at the putt out.

Hitting gophers actually brings up another point: random gophers.

In the original game, gophers popped up at random which was a sore spot for some at competitions as it was a variable out of the player's control that favored certain players randomly. In No Good Gofers: Battle For The Green, gophers only rise by hitting certain shots which makes them more player controlled. Also they will raise to make a comment if the ball is trapped or drains.

To raise the gophers, shoot the left ramp to light 'raise gopher' then shoot the left ramp again. Which gopher pops up alternates between the two.

Also the gophers raise for senseless banter, but only when the ball is drained or held at the putt out, so, technically, they shouldn't be able to block a shot at that time.

The golf cart can be hit by dropping the slam ramp. The slam ramp is dropped by the side ramp shot. Note that the player will receive a stroke count for hitting the cart but not gophers.

Mode completion and progress is displayed during end of ball bonus. Additionally, while a mode is being played the player will know how far away from completion by the color of the mode letters. Letters not acquired show gray. Letters acquired show white. Once the letters are completely spelled a completion bonus of 10 million will be awarded.

After the mode is completed, it will not end if time remains on a timed mode or there is more than one ball on the play field for a multi ball mode. The player can continue to accumulate hits and score bigger points. After the initial spelling of the letters and completion bonus, all additional shots will score 2x and the letters will spell in yellow. If the letters are spelled a second time, scoring will raise to 3x and the letters will spell in red. There is no additional completion bonus for spelling the letters a second or third time however, time will be added to the clock in timed modes.

GOPHER HUNT MODE

Freeze gopher! This is a single-ball-timed mode in which the player hunts gophers at night. The playfield general illumination lights are out and the screen is black with the exception of a circle of light that pans across the screen. When a gopher pops up it is time to blast him! Each gopher stays up for about 5 to 8 seconds and a gopher hit is worth big points. If you hit one (or miss and time elapses) he will drop down and you have to search for another.

While the gopher is underground, the k-i-c-k targets light and if hit they add time to the clock. The player can hit the k-i-c-k targets up to 3 times, but time cannot be added past that.

Like all modes, each gopher hit spots a letter. Spell G-O-P-H-E-R-H-U-N-T for 10 million points and to complete the mode. Once the mode is completed the player will be one step closer to the sorcerer wizard mode.

DANCE PARTY MODE

The gophers are dancing! This is a single-ball-timed mode in which both gophers are up constantly throughout the entire mode except when they are hit. When they're hit, they will hide in their holes for a few seconds, but the music always lures them back up to the dance floor. A gopher hit is worth big points. Like all modes, each hit spots a letter. Spell out D-A-N-C-E-P-A-R-T-Y for 10 million points and to complete the mode.

SPEED GOLF MODE

Golfing in half the time! This is another single-ball-timed mode in which many of the stroke lights are lit, all strokes travel 300 yards instead of the standard 100 yards, and all putt outs are worth big points instead of being dependent on under par scores. To spell out the letters of S-P-E-E-D-G-O-L-F, the stroke shots count, however, the big scoring is at the putt outs, so be aware of that. Like all other modes, completion awards 10 million. Also, note that since you are completing holes here, you will also receive the appropriate end-of-ball bonus based upon your stroke count.

There is no wheel award during speed golf such as super jets or big spinners. As soon as the player putts out, the ball flies back out to the flippers immediately.

SHORT CIRCUIT MODE

Bud got stuck below the playfield and is destroying everything! This is the last of the four single-ball-timed modes. When Bud chews the wires, the flippers become reversed, such that the left button now controls the right flipper and vice-versa. There are two ways to set up scoring in this mode.

Shoot the putt out to swap flipper operation from normal to reversed and vice versa. When flippers are reversed, the point scoring is 10x higher. Additionally, the area of the playfield which is lit for big points is randomly re-chosen when the putt out shot is hit.

Lastly, when the putt out shot is hit, approximately 8 seconds are added to the clock, but only the first 3 times the shot is hit.

Hitting lit shots with flippers reversed awards big points and hitting lit shots with flippers normal awards an amount of points equal to 10% of those when flippers are reversed.

For example, the mode starts with the flippers reversed and randomly the side ramp and skill shot targets are lit. You can hit the side ramp for big points per hit since the flippers are reversed. However, maybe the side ramp shot is difficult for you so you shoot the putt out instead in order to choose a different shot (maybe). The flippers are restored to normal operation and the game randomly chooses to illuminate the sand trap lights (of course, there is a chance that the side ramp is picked again). But since flippers are under normal operation, the shots are worth much less. You could hit the sand trap, or go for another reverse at putt out and another swap of lit lights. It is up to you.

To score letters, hit the lit areas of the playfield. Like all other modes, completion awards 10 million and the player will be one step closer to the sorcerer wizard mode.

CART SMASH MODE

Bud's in your golf cart and it's out of control and is destroying everything! This is a 4-ball multi-ball mode. The slam ramp drop is lit constantly so any inlane switch trigger, either left or right, will drop the slam ramp and allow the player to shoot at the cart for big points.

In addition to shooting the cart, the TNT light is lit at the center ramp. Each cart hit or TNT hit grants a letter to spell out C-A-R-T-S-M-A-S-H. Mode completion awards 10 million.

NAP TIME MODE

The gophers are sleeping in their holes. Can you wake them up? This is a 3-ball multi-ball mode. Both gopher holes are open with the ramps up and gophers down. Shoot the ball in

the hole to raise the respective gopher and try to hit them. But be quick! The gopher only pops up for about 2 seconds. Gopher hole shots are worth big points and grants a letter to spell out N-A-P-T-I-M-E. Hitting a raised gopher is super-hard and worth much, much more. Mode completion awards 10 million.

Note: some machines gophers mechanisms can be finicky and sometimes when the gopher should be up or the hole open, it is not and the ramp is down. Because of this, the code was written such that a gopher ramp shot also counts as a hole shot during this mode.

THUNDERSTORM MODE

Golfing in the rain? Are you crazy?! Just don't get hit by thunder! This is a 5-ball multi-ball mode. The playfield lights are all turned off and the sound of a terrible thunderstorm rages. When a lightning bolt strikes, an area of the playfield is lit for a number of seconds. Hit the lit area for big points. The area which is lit does not change when hit, but only after the time out so be ready for your easiest shots and wail on them! Each hit grants a letter to spell out T-H-U-N-D-E-R-S-T-O-R-M. Mode completion awards 10 million and the player will be one step closer to the sorcerer wizard mode.

RIP OFF MODE

The gophers are brazenly trying to steal your clubs! This is a 4-ball multi-ball mode. Shoot the captive ball for big points and each hit grants a letter to spell out R-I-P-O-F-F. Mode completion awards 10 million.

Unlike the other 7 modes described above, ripoff is started by hitting the captive ball, not the gophers or golf cart. But like the other modes, when ripoff is completed it cannot be restarted until all modes are completed and ripoff is also one of the permissives for reaching the final sorcerer mode.

SORCERER MODE

Bud found a sorcerer's wand. What could possibly go wrong?! Poor Buzz just got turned into a donkey! This is a 6-ball multi-ball mode. Multiple areas of the playfield are lit and which areas are lit change whenever Bud shakes his wand. Shots are worth big points.

The sorcerer mode is the second of our aptly-named "wizard" modes and is only available once all of the other 8 mini-modes have been not only started but also completed. This means the sorcerer mode is going to be the most difficult of all of the modes to achieve since you will need to get all of the letters on all of the other 8 modes which can be nearly impossible. You might have to lower the game difficulty to do it.

The game play of the sorcerer mode is similar to the Thunderstorm mode in that flashing areas of the playfield score big points and those areas change every few seconds. The difference is that in sorcerer all six balls will be on the playfield and that instead of one area of the playfield flashing at a time as in Thunderstorm, in sorcerer at least two area will flash simultaneously. Additionally, the point values are much, much higher.

In this mode, when Bud raises his wand a lot of pinball mayhem commences.

MENUS

Entering any of the options menus during a currently running game will end the game.

OPTIONS MENU

Hit the enter button on the coin door to start the options menu where you can access the following:

- Tests Menu

- Settings Menu

- Audits Menu

- Utility Menu

- Installs Menu

- USB Menu

The selected item will be highlighted in yellow. Push the enter button to select the item or execute the function.

TEST MENU

- switch edge test – test an individual switch

- switch level (matrix) test – read all switches and display the last switch made

- lights test – choose which lamp you want to flash

- all lights test – flash all lamps

- GI test – flash all the general illumination lamps

- coil test

- flasher test

- flipper test

- Bud and Buzz test – raise or lower gophers and check their associated switches

SETTINGS MENU
Settings Menu: Coil Strength Adjustments:
Adjust the coil strength of coils. The default values should work well, but this adjustment

is available if your outlet power is too low or too high. The default settings should work for the majority of installations, however.

This should not be considered a substitute for replacing old and weak coils.

Please be very careful on the adjustments here as coils which are set with a pulse time that is too long might propel the ball too hard and break things or possibly burn up the coil.

The slam ramp coil is a special case as it has three distinct adjustments. There is a menu item for slam ramp, slam ramp pulse on, and slam ramp pulse off.

The reason for these three different settings for the slam ramp is that unlike a normal coil which energizes for a very brief time (a pulse), the slam ramp may be pulled down for several seconds. So then, the software code needs to operate the coil in two different ways: it needs an initial pulse to pull the coil down and a "holding" pulse-pattern to keep the coil down.

The initial pulse is labeled "slam ramp" in the options menu and like all the other standard coils, this number corresponds to an amount of milli-seconds that the coil is energized in order to move it.

Once the coil is down, we do not want to maintain that large of a power on the coil or it will either blow a fuse or burn up. So instead, the software switches to a pulsed-pattern. In the menu the pulsed-pattern corresponds to an on-off cycle that will repeat until the slam ramp is told to go back up. This can be for several seconds. The on-off pattern in the menu is labeled "slam ramp pulse on" and "slam ramp pulse off". These numbers are, again, milli-second values.

Please note that if the pulse-pattern is on too long and off too short, the slam ramp coil will heat and eventually burn or blow a fuse.

If your slam ramp is not going down forcefully enough or is going down too forcefully, adjust the "slam ramp" value accordingly, but do NOT adjust the "slam ramp pulse on" or "slam ramp pulse off".

Settings Menu: Feature Adjustments:
Here you can adjust setting that are specific to NGG2.0. Here are some specifics to note.

Skillshot Timer:
Note that if the skill shot timer is set to a number less than the timed plunger, the timed plunger will automatically fire one second before the skill shot timer ends regardless of where it is set here.

Mode Start Difficulty:
this sets the number of letters needed to complete a mini mode and also the number of letters to spell bud, buzz, or cart and start the mini-modes.

Mode Start Difficulty (Intro Only):
Similar to Mode Start difficulty, but Intro difficulty only applies to the bud, buzz, or cart letters and is for the very first go around only. After the letters are completed for a gopher or for a cart and the permissive is used to play a mini-mode, the number of letters needed will be set to the value specified in Mode Start Difficulty.

Settings Menu: Pricing Adjustments:
Here the game can be set on free play as well as coin play. If set on coin play the game can be set on two different pricing tiers.
The idea with the pricing tiers is that if the player inserts multiple coins then bonus credits will be awarded. For example, 1 coin is one credit; 2 coins might be 3 credits.

Settings Menu: Standard Adjustments:
These are settings that are generally considered generic to most all pinball machines, such as balls-per-game or tilt sensitivity.

Disabling Autoplunge
In some certain situations, you may want to disable the auto plunge feature of the game. In general this is not recommended as it will also disable ball search until the first switch is hit, but if you are playing some sort of tournament where it needs to be disabled then you can do that as follows:

First turn the skill shot timer adjustment to OFF.
Next turn the timed plunger adjustment to OFF.

AUDITS MENU
The AUDITS menu contains data for the games played since the machine was last reset.
If you are having problems with the audits, you may want to restore the statistics to the factory default using the utilities menu.

Note that the audits menu simply displays the current audits on screen. If you want to download the audits to a USB stick, you can do so in the USB menu.

UTILITY MENU
Here the user can clear audits, high scores, or reset settings to factory values.

INSTALLS MENU
Here the user can change many settings all at once. For example changing all settings to easy or hard.

INSTALL EXTRA EASY

warnings_to_tilt 10	Cart_Smash_BallSaveTimer 40
multiple_hit_window 1000	Nap_Time_BallSaveTimer 40
Max_Extra_Balls 5	Thunderstorm_BallSaveTimer 40
Ball_Save_Timer 13	Ripoff_BallSaveTimer 40
Game_Difficulty 1	Cart_Smash_Multiballs 4
Game_Intro_Difficulty 1	Nap_Time_Multiballs 4
Dance_Party_Timer 120	Thunderstorm_Multiballs 6
Speed_Golf_Timer 120	Ripoff_Multiballs 5
Gopher_Hunt_Timer 120	Cart_Smash_BallSaveTimer 40
Short_Circuit_Timer 120	Thunderstorm_BallSaveTimer 40
nineteenth_Timer 150	Ripoff_BallSaveTimer 40
DanceParty_BallSaveTimer 40	Nap_Time_BallSaveTimer 40
SpeedGolf_BallSaveTimer 40	BigSpinners_Timer 55
GopherHunt_BallSaveTimer 40	SuperJets_Timer 55
ShortCircuit_BallSaveTimer 40	superJets_Difficulty 1
	bigSpinners_Difficulty 1

INSTALL_EASY

warnings_to_tilt 5	Nap_Time_BallSaveTimer 25
multiple_hit_window 500	Thunderstorm_BallSaveTimer 25
Max_Extra_Balls 3	Ripoff_BallSaveTimer 25
Ball_Save_Timer 7	Cart_Smash_Multiballs 4
Game_Difficulty 2	Nap_Time_Multiballs 4
Game_Intro_Difficulty 1	Thunderstorm_Multiballs 6
Dance_Party_Timer 75	Ripoff_Multiballs 5
Speed_Golf_Timer 120	Cart_Smash_BallSaveTimer 40
Gopher_Hunt_Timer 75	Thunderstorm_BallSaveTimer 40
Short_Circuit_Timer 75	Ripoff_BallSaveTimer 40
nineteenth_Timer 135	Nap_Time_BallSaveTimer 40
DanceParty_BallSaveTimer 25	BigSpinners_Timer 45
SpeedGolf_BallSaveTimer 25	SuperJets_Timer 45
GopherHunt_BallSaveTimer 40	superJets_Difficulty 2
ShortCircuit_BallSaveTimer 40	bigSpinners_Difficulty 2
Cart_Smash_BallSaveTimer 40	

INSTALL_NORMAL

warnings_to_tilt 3	Cart_Smash_BallSaveTimer 25
multiple_hit_window 300	Nap_Time_BallSaveTimer 25
Max_Extra_Balls 2	Thunderstorm_BallSaveTimer 25
Ball_Save_Timer 7	Ripoff_BallSaveTimer 25
Game_Difficulty 3	Cart_Smash_Multiballs 3
Game_Intro_Difficulty 2	Nap_Time_Multiballs 3
Dance_Party_Timer 60	Thunderstorm_Multiballs 5
Speed_Golf_Timer 75	Ripoff_Multiballs 4
Gopher_Hunt_Timer 60	Cart_Smash_BallSaveTimer 25
Short_Circuit_Timer 60	Thunderstorm_BallSaveTimer 25
nineteenth_Timer 120	Ripoff_BallSaveTimer 25
DanceParty_BallSaveTimer 25	Nap_Time_BallSaveTimer 25
SpeedGolf_BallSaveTimer 25	BigSpinners_Timer 30
GopherHunt_BallSaveTimer 25	SuperJets_Timer 30
ShortCircuit_BallSaveTimer 25	superJets_Difficulty 3
	bigSpinners_Difficulty 3

INSTALL_HARD

warnings_to_tilt 2	Nap_Time_BallSaveTimer 8
multiple_hit_window 300	Thunderstorm_BallSaveTimer 8
Max_Extra_Balls 1	Ripoff_BallSaveTimer 8
Ball_Save_Timer 4	Cart_Smash_Multiballs 3
Game_Difficulty 4	Nap_Time_Multiballs 3
Game_Intro_Difficulty 3	Thunderstorm_Multiballs 5
Dance_Party_Timer 50	Ripoff_Multiballs 3
Speed_Golf_Timer 60	Cart_Smash_BallSaveTimer 15
Gopher_Hunt_Timer 50	Thunderstorm_BallSaveTimer 15
Short_Circuit_Timer 50	Ripoff_BallSaveTimer 15
nineteenth_Timer 90	Nap_Time_BallSaveTimer 15
DanceParty_BallSaveTimer 15	BigSpinners_Timer 25
SpeedGolf_BallSaveTimer 15	SuperJets_Timer 25
GopherHunt_BallSaveTimer 15	superJets_Difficulty 4
ShortCircuit_BallSaveTimer 15	bigSpinners_Difficulty 4
Cart_Smash_BallSaveTimer 15	

INSTALL_EXTRA_HARD

warnings_to_tilt 1	Thunderstorm_BallSaveTimer 8
multiple_hit_window 300	Ripoff_BallSaveTimer 8
Max_Extra_Balls 0	Cart_Smash_Multiballs 2
Ball_Save_Timer 2	Nap_Time_Multiballs 2
Game_Difficulty 5	Thunderstorm_Multiballs 4
Game_Intro_Difficulty 5	Ripoff_Multiballs 3
Dance_Party_Timer 30	Cart_Smash_BallSaveTimer 8
Speed_Golf_Timer 30	Thunderstorm_BallSaveTimer 8
Gopher_Hunt_Timer 30	Ripoff_BallSaveTimer 8
Short_Circuit_Timer 30	Nap_Time_BallSaveTimer 8
nineteenth_Timer 90	BigSpinners_Timer 20
DanceParty_BallSaveTimer 8	SuperJets_Timer 20
SpeedGolf_BallSaveTimer 8	superJets_Difficulty 5
GopherHunt_BallSaveTimer 8	bigSpinners_Difficulty 5
ShortCircuit_BallSaveTimer 8	
Cart_Smash_BallSaveTimer 8	
Nap_Time_BallSaveTimer 8	

INSTALL_MASSIVE_MULTIBALLS

Cart_Smash_Multiballs 4	Thunderstorm_BallSaveTimer 40
Nap_Time_Multiballs 4	Ripoff_BallSaveTimer 40
Thunderstorm_Multiballs 6	Nap_Time_BallSaveTimer 40
Ripoff_Multiballs 5	
Cart_Smash_BallSaveTimer 40	

INSTALL_CHAD_TOURNEY

warnings_to_tilt 2	SpeedGolf_BallSaveTimer 10
multiple_hit_window 300	GopherHunt_BallSaveTimer 10
Max_Extra_Balls 0	ShortCircuit_BallSaveTimer 10
free_play True	Cart_Smash_BallSaveTimer 10
skillshot_timer 0	Nap_Time_BallSaveTimer 10
skillshot_autoplunge_timer 0	Thunderstorm_BallSaveTimer 10
CoinDoorDisableTilt_Timer True	Ripoff_BallSaveTimer 10
Ball_Save_Timer 4	Cart_Smash_Multiballs 3
Game_Difficulty 5	Nap_Time_Multiballs 3
Game_Intro_Difficulty 5	Thunderstorm_Multiballs 5
Dance_Party_Timer 30	Ripoff_Multiballs 4
Speed_Golf_Timer 30	Cart_Smash_BallSaveTimer 10
Gopher_Hunt_Timer 30	Thunderstorm_BallSaveTimer 10
Short_Circuit_Timer 30	Ripoff_BallSaveTimer 10
nineteenth_Timer 90	Nap_Time_BallSaveTimer 10
DanceParty_BallSaveTimer 10	BigSpinners_Timer 20
	SuperJets_Timer 20
	superJets_Difficulty 4
	bigSpinners_Difficulty 4

USB MENU

Here the user can download audits or logs to a USB stick as well as install software upgrades as well as clear log files.

On the software update menu, you will see the current software revision installed on your machine.

USB MENU: SOFTWARE UPDATE

In the event that new code becomes available, it is simple to upgrade your machine to the latest software. Here are the steps necessary to perform the upgrade:

- Obtain the new, upgraded software and copy the file to a blank USB memory stick. Most memory sticks sold in the USA are pre-formatted in FAT (FAT32). This is the way the stick should be formatted in order for the NGG2.0 CPU to read it. If your stick has different formatting then your stick will most likely not work. The file should be a single file and have the extension 'CPD'.

- Ensure the stick is blank and nothing else is present on the stick. It is our recommendation to not use a stick that had been previously used on anything else as the NGG CPU does not perform a virus check.

- Copy the update file to your USB stick. Do NOT change the file name.

- Insert the memory stick in an open USB slot on the NGG CPU.

- Navigate to the menu and then the USB menu->then the UPDATE submenu

- Execute the command by pressing enter. Do NOT turn off the game while files are being copied.

- Once the file copying is complete, you will need to shutdown the game and reboot it for the new software to take effect.

Please note that the upgrade file will only include data that were changed and not the entire system, so the file copying should be fairly quick.

If your system has become corrupted such that you think you will need an update of the entire system, please contact us for a replacement hard drive/CPU.

TROUBLESHOOTING
Listing of Specific Components Operation

In order to aid in trouble shooting, please peruse the following specific operation and purpose of select components:

Power supply

Converts 120-240v AC power to adjustable 12v DC power on two separate channels, with fuses, and sends it to the FAST audio board. The power supply unit has an LED indication that shows green when outputting voltage. The power supply unit also has an adjustable potentiometer. If used, please check the voltage at the destination with the boards energized when setting voltage. Do NOT adjust the voltage potentiometer without a meter.

FAST audio board

This board has 2 purposes:
1) Audio amplifier -- Splits the audio signal such that there is two normal channels and two subwoofer channels and amplifies all four of them independently.
2) Startup Shutdown controller -- Senses power at the RJ45 jack and turns on or off the 12vDC output as appropriate so that the NUC CPU and display will turn on or off.

NUC CPU

Contains all of the programming and logic for the 2.0 system as well as the graphics and sound system for the 1.0 system. Communicates with the FAST controller to control the pinball machine and sends sound and graphics to the monitor.

FAST controller

Contains all of the programming and logic for the 1.0 system as well as the machine interface for the 2.0 system. Receives commands from the NUC CPU and interfaces with all of the original hardware such as reading the status of playfield switches and sending flasher, lights, and coil signals to the appropriate hardware.

RJ45/Ethernet cable

This cable connects the FAST controller with the FAST audio board. Its only purpose is to tell the FAST audio board when power is on so that the FAST audio board can turn on power to the NUC CPU and the display. Please note that since the FAST audio board is powered by the 12v power supply fed from the service outlet, the power to the FAST audio board will always be on as long as the machine is plugged into an energized wall outlet. However, the FAST controller is powered by the power driver board and then will only turn on when the power switch to the machine is turned on. When that happens, the FAST audio board senses it through the RJ45/Ethernet cable and tells the NUC CPU to turn on.
Some users elect to leave the power switch always closed on their machines and instead switch banks of machines on or off using either a circuit breaker or some other sort of power switch that kills power to the wall outlets. In this scenario the system will also work as designed.

Mini USB cable
This cable connects the NUC CPU to the FAST audio board. Its only purpose is to allow the CPU to communicate with the audio board when changing volume in the service menu. This cable is not needed to run the system and if missing will only prevent the user from changing discreet volume settings. The overall volume of the system is set on the CPU however, so this can still be altered.

Micro USB cable
This cable connects the NUC CPU to the FAST controller. Its purpose is to allow two way communication between these two components. When in 2.0 mode, the FAST controller will shut down all lights and coils if this communication is lost. Once communication is restored, lights and coil controls will restart. If this happens, the watchdog light on the upper left hand portion of the FAST controller will light. If you have a problem with everything on the playfield randomly dying for a second or more then it is surely the watchdog killing everything in order to protect the playfield circuitry. Please verify that the Micro USB cable is good and not too close to other wiring.
In 1.0 mode, the communication between the FAST controller and the NUC CPU is only to send sound and graphics data to the NUC CPU.

HDMI cable
This cable connects the NUC CPU with the monitor. Its purpose is to relay both sound and video to the monitor. The video is displayed and the sound is converted from digital to analog at the monitor and then sent onto the audio board for amplification.

Audio cable
This cable connects the monitor and the FAST audio board. Its purpose is to relay analog sound to the audio board for amplification.

TROUBLESHOOTING
System Operation

The No Good Gofers: Battle For The Green kit electrical operations are as follows:

The power supply is plugged into the service outlet and converts the nominal input voltage into 12VDC and is fused there. The 12VDC output voltage powers the FAST audio board. So the FAST audio board will always have power as long as the machine is plugged in because the service outlet does not power down when the cabinet power switch is turned off.

The FAST controller is powered by the WPC power driver board and then it only powers up when the machine is switched on. The FAST audio board detects the power being on through the ethernet cable connected to the FAST controller and when it sees power it energizes both of its two outputs through two fuses. These two outputs are connected to the display monitor and the CPD CPU. The two fuses have green LEDs behind them and if the two green LEDs are illuminated then the fuses are good. If either light is out then that means a fuse is blown or missing.

When the CPU boots, it communicates with the FAST controller through a micro USB cable. This communication tells lights to light and coils to fire as well as letting the CPU know when switch hits are made. A watchdog circuit will de-energize all coils and lights if communication is lost between the CPU and the FAST controller. If the watchdog circuit triggers then an LED on the top left hand corner of the FAST controller will illuminate to indicate this loss of communication with the CPU.

Audio and video output from the CPU go to the monitor on the HDMI cord and the audio is then forwarded on from the monitor to the FAST audio controller through an analog audio cable.

So then the FAST audio board serves two purposes. It turns on and off the CPU and display when power is detected and it also controls and amplifies sound that is outputted to the speakers.

Volume can be controlled in 2 places in the software. The master volume of the CPU is controlled on the first screen of the service menu when the coin door is opened. The volume of the individual components on the FAST audio board can be set in the audio section of the settings menu of the service menu. The controlling of the volume on the FAST audio board by the CPU happens through the mini USB connector between the FAST audio board and the CPU.

Finally, the FAST controller has available ethernet connection ports for future use to connect accessory controller boards.

TROUBLESHOOTING
Steps to Fix Specific Problems

Problem:
 The game boots up then shuts down shortly after it boots, or locks up while playing.

What to check:
This is typically because the CPU power input voltage is too low. Verify the power supply voltage is at 12.5vdc minimum and that the power connections to the CPU and leaving the FAST audio board are good and not loose.

Problem:
 The machine boots up then stops at a screen that says "loading xxx of xxx" crashes to a screen full of text about 30 seconds after power on.

What to check:
This is due to no connection found between the CPU and the FAST controller. The CPU is waits to connect to the FAST controller for about 30 seconds at this point but if no connection is found will exit. Verify the micro USB cord is plugged firmly into both the CPU and the FAST controller. Verify the FAST controller is being powered up and its green LEDs are on. Also note that the FAST controller may take a few seconds to initialize at this point so make sure wait at least 10 or so seconds before you assume there is a problem.

Problem:
 A coil doesn't fire strong enough or when it fires it makes a chattering-humming noise.

What to check:
Either the coil is too weak and needs to be replaced or the coil strength in the options menu is set too low for your machine due to a low input voltage.
You can test the coil in the tests menu and change the coil strength in the settings menu. Bounce back and forth between these two menus until you are happy with all of your settings.
Please note that this should not be considered a substitute for NOT replacing faulty coils.
Also note, that this doesn't help too much with flippers since flippers are a two coil device and then due to the operation of a flipper coil, if it is too weak due to age, boosting its energized time will not work to make it stronger.

Problem:

The game volume is way too loud or way too low.

What to check:

Note that there are two different places to adjust volume settings in the settings menu in addition to a hidden place on the display. The first is a master volume control that appears when the coin door is first opened and affects the entire system. The second set of volume controls as in the settings menu and allow you to set individual volumes for the cabinet speakers and the backbone speakers.

Additionally, there is a third place to adjust volume on the back of the monitor but this must be done manually by pressing the up or down buttons on the back of the monitor. We set this volume control to 50 as a default when the kit is shipped.

Problem:

Sound doesn't sound quite right. It seems hollow.

What to check:

The speakers in the back-box and subwoofer in the base cabinet should be wired in the same polarity. Positive-to-positive, and negative-to-negative. If they are in opposite polarity, some of the sound waveforms may cancel each other out which results in loss of part of the sound spectrum.

Problem:

Switch(es) are not working.

What to check:

If your machine was working prior to the installation, then you may have disturbed a wire or connector and now it is not making a good connection. Also it is possible that you wired your FAST controller up incorrectly.

All of the switch reading wires come directly into the FAST controller on the connectors at the bottom. You can start checking there. There are two different switch test menu items as well that should be helpful in diagnosing the problem.

Problem:

The wrong switch is activated when another switch is hit.

What to check:

This is typically caused by a shorted diode in the switch matrix and is documented on the FAST website. This is not a problem with your kit but a problem with the pinball machine itself.

Problem:
Coil(s) are not working.

What to check:
If your machine was working prior to the installation, then you may have disturbed a wire or connector and now it is not making a good connection.

All of the coil outputs come off the power driver board and the FAST controller directly communicates with the power driver board. You can start checking there. There is a coil test menu items as well that should be helpful in diagnosing the problem.

Problem:
The flashers in the back of the playfield and the red, white, and blue dome flashers do not work.

What to check:
If your machine was working prior to the installation, then you may have disturbed a wire or connector and now it is not making a good connection. Also it is possible that you wired your FAST controller up incorrectly.

The flashers described above are NOT powered by the power driver board, but the aux-8 board. The aux-8 board is also called the 8-unit flasher board. The aux-8 board is a small board that sits above the old WPC-95 CPU board (now the FAST controller) and has a ribbon connector to it that allows the FAST controller to communicate with it. You can start checking there.

Problem:
There is no power coming out of the power supply even though it is plugged in and neither of the fuses are blown.

What to check:
These power supplies have a protective circuit in them that shuts off all output if it detects a downstream short. This protective circuit can only be reset by powering down the supply. So then first step would be to unplug both of the 12v cords from their loads then unplug the power supply from the service outlet and then plug it back into the service outlet. If the little green light illuminates on the power supply (even better if you have a means of verifying that it has a 12v output) then the short is downstream of the output. If the power supply still will not put out voltage then either the cables or connectors on the ends of the cables have a short or the power supply itself is bad. I would check the end connector first. You can determine which side is bad, if any, by checking with one of the fuses removed to check one side at a time.

Problem:

The CPU will not boot. I removed the backglass panel and the NUC CPU light is blinking in a pattern.

What to check:

The power LED on the Intel NUC blinks in a pattern if an error occurs during power on self test. Below are the manufacturer's patterns and what to do to check it out.

Pattern: 3 blue blinks (1.0 second each) three times, then 2.5-second pause (off). The pattern repeats until the computer is powered off.

This is a memory error. We have found that this error will come up if the game is rapidly power cycled because when the game is turned off and immediately back on, the memory does not have enough time to reset to its default state. So the first thing to do is to turn off the machine for about 30 seconds then turn it back on. If the problem still exists and there really is a true memory problem then follow the below.

- Remove and reseat memory.
- Make sure the contacts on the memory and the socket are clean.
- Check for a faulty memory module by trying the memory in a known good system.
- Try using just one memory module at a time, swapping it between the upper and lower memory slots.

Pattern: 1 orange blink every 5 seconds

This is caused by the on/off button being stuck down or shorted internally. The on/off button is above the power LEDs on the CPU and actually should never be touched as the system is set up to be turned on and off by the FAST audio board.

Pattern: 1 blue blink every 5 seconds

Power-on circuit may have failed.

- Deenergize the CPU for at least 30 seconds and try powering back on.
- Check power supply input voltage at the power supply.

Pattern: 16 blue on/off blinks 0.25 seconds on, 0.25 seconds off, for a total of 16 blinks. Then the NUC shuts down.

CPU thermal trip warning. Check that chassis ventilation holes are not blocked and unit has sufficient airflow. Check CPU fan.