Author | Topic: Prototype Whitewood Project (Read 23738 times)

JoeShabadu2000
Wizard
Posts: 118

Re: Prototype Whitewood Project
« **Reply #15 on:** September 04, 2012, 12:24:36 AM »

Thanks for the heads up regarding the diodes. I think I will go ahead and remove all the diodes, since the PD16 has them installed I don't see the need for redundancy, and I would prefer not to accidentally blow up my PD16. I take it that for coils (once the diodes are removed) the polarity of wiring doesn't matter? This makes sense to me from a physics standpoint, I just want to make sure that this is true from a practical standpoint as well.

I spent all day today doing measuring, marking, and drilling, so I didn't end up hooking up any coils yet anyway. I'll post some on my adventures in drilling in tomorrow's installment!

Logged

Gerry Stellenberg
Administrator
Posts: 2399

Re: Prototype Whitewood Project
« **Reply #16 on:** September 04, 2012, 12:36:44 AM »

Correct - after the diodes are removed the wiring polarity won't matter on **single wound coils** (two lugs). Dual wound flipper coils (three lugs) will still need power connected to the common lug and the switched returns wired to the other lugs. This is for the 'newer' flipper coils found in most WPC machines since the late 80's. These coils have two windings wired in parallel.

Just for completeness... older Bally flipper coils have two windings wired in series. I doubt anybody will be using these, but if so... they get power wired to the non-common high power lug and the switched returns to the other lugs.

- Gerry

Logged

JoeShabadu2000
Wizard
Posts: 118

Re: Prototype Whitewood Project
« **Reply #17 on:** September 04, 2012, 12:04:38 PM »

It is now time to start making some holes in our playfield so we can start mounting our lower playfield components. The locations of these holes are going to be determined, in most cases, from measurements I made from the pinball

machines I have at my house. I didn't want to disassemble the games too much, so some of my measurements are based on screw locations, or measurements that I made by "hovering" my eye and trying to get the right perspective, so they could be off by 1/8" or more. This probably wouldn't fly if we were doing this in CAD or something, but since we are using hand tools and aren't trying for absolute perfection anyway, I think we'll be good.

A quick note about my hole production routine. I am marking all the holes using a pencil, then using a 1/16" drill bit to make an pilot hole, this should hopefully get the centers of the resulting larger holes as close to their intended location as possible. If my final hole is less than 1/4" or so in diameter, then I will drill the final hole without drilling an additional pilot. If my final hole is larger than 1/4", I will drill an additional 3/16" pilot hole to remove some more material before making the final hole. Remember, the larger the bit, the slower drill speed you should use.

I don't know if it is my drill bit or what, but my "exit holes" from the MDF are atrocious, the underside of my playfield is pretty ripped up. If anyone has suggestions about bits to use that will make a nice clean exit hole, please let me know. I don't think it will affect my build too much, but it sure is ugly and takes extra time to clean up after I have drilled the holes. Until I can get this part figured out, I am going to be sure to drill all my holes from the top to the bottom, that way the top of the playfield stays clean.

We will start with the flipper hole, measurements from Terminator 2. The holes for the flippers are 1/2" diameter and the centers are located 7" up from the bottom edge of the playfield. On the T2 playfield, the left flipper hole is 5 13/16" away from the left edge, and the right flipper hole is 7 13/16" from the right edge of the playfield. The flipper holes are 6 13/16" apart from center to center. This adds up to 20 7/16", which is close enough to the 20.5" width of the overall playfield to give me reasonable confidence that these are good measurements.

Once the flipper holes are drilled, we will do a test fit of our flipper assemblies. I am using complete Williams flipper assemblies available from pinballlife.com. To attach these assemblies to the playfield, I am using hex head #6 wood screws x 1/2" long, which are the same ones used on all my "real" pinball machines. These are also available from Pinball Life. You will also need two flipper bat and shaft assemblies. I am also including the part number here of the playfield rubber assortment that I bought, but at this point all you will need are two flipper rubbers to put on your bats.

234-5100-00.5 #6 x 1/2" Unslotted Hex Head Screw $0.06
pbl_A-15205-R-2_A-15205-L-2 Full Flipper Assembly For Williams/Bally Machines From 02/1992 To 10/1998
Options:
Choose A Base Plate : Left Choose A Coil : FL-11629 Choose a Coil Stop : A-12390 $36.50
pbl_A-15205-R-2_A-15205-L-2 Full Flipper Assembly For Williams/Bally Machines From 02/1992 To 10/1998
Options:
Choose A Base Plate : Right Choose A Coil : FL-11629 Choose a Coil Stop : A-12390 $36.50
pbl_20-9250-5_20-9250-6 Williams Logo Flipper And Shaft Assembly
Options:
Choose A Color : White $3.00
125_black_set 125-Piece Black Rubber Ring Set
Options:
Choose Flipper Rubber Color Combination : 6 Black $29.95

You will need one left assembly and one right assembly. I am using 11629 coils since they are the strongest, I figure if they are too much power then I can

always use the "pulse" command in my machine yaml file to reduce their strength. I don't know what difference the choice of coil stop makes, I think that is more important if you are replacing an existing assembly in a game.

With the playfield turned over, insert the nylon bushing of the flipper assembly into the flipper hole. Make sure that you have the left and right flipper assemblies in their proper location and orientation, remember that since you have the playfield flipped over that the right flipper will be on your left side, and vice versa. I have included a picture of the T2 underside, the picture attached has been rotated so that that the view is as it will look when you are seeing it on your rotisserie. Once you get the assemblies positioned so that they are roughly equivalent to the photo, use your pencil to mark where the mounting screws will go.

Remove the flipper assemblies, and use your 1/16" drill bit to make some pilot holes. You want to be careful to not drill all the way through the playfield when making these pilot holes. I used a black marker to make a line on my drill bit at the 1/2" mark. While drilling, I was careful to make sure that I didn't insert my drill bit past this point. I have attached a photo showing the flipper holes and the pilot screw holes for the flipper assemblies.

Once all your pilot holes are drilled, go ahead and affix the flipper assemblies to the playfield. We are only going to be doing this temporarily (lots more holes to drill and we don't want sawdust in our flipper assemblies) so I only used two screws per assembly. Since we are using 1/2" MDF instead of the 17/32" wood that would be used on a real playfield, I am going to be using a washer on each #6 screw to make sure that I don't punch through the top of the playfield.

Go ahead and put your rubbers on your flipper bats. Insert the flipper bat through the top of the playfield (which is upside down at this point), and tighten the nut on the pawl of the flipper assembly so that the bat doesn't fall back through. However, you want to leave it a little bit loose so that you can still make the bat move if you put a little pressure on it. This will help us set up the approximate flipper angle. You will find the right tension without too much work, trust me. Once you have both flipper bats in place, rotate the playfield so you are looking at the top again. Move the flipper bats so that they look like they are in a reasonable playing position, they don't have to be exact.

We are going to use our flippers to position our return lane guides. I purchased my lane guides from marcospecialties.com.

Ball guide - clear return lane guide 550-5037-01 2 $12.95

They are vertically symmetrical, so you just flip them over to use on either the left or right side. Positioning the ball guides is going to be by eyeball mostly. On the part that sits next to the flipper, there is a cutout that matches the flipper curvature, you want about a 1/8" gap there. The top of the slanted portion of the lane guide should be in a straight line with the top edge of the flipper rubber, you may have to make some additional adjustments to the orientation of your flipper bats to make this happen. Once you have that positioned, you want to make sure that the vertical part of the lane guide is completely vertical. I used a ruler to draw a vertical line on my playfield in the approximate position where the lane guide would go, and I used this line as a reference to get this part of the lane guide vertical. When you have the flipper end positioned with the appropriate spacing, and the upper vertical portion lined up with your straight reference line, you can start marking where the holes will go.

Marking the holes for the lane guides was a bit of a tricky process. The screw holes for the lane guides are long and narrow, so I couldn't insert a pencil or pen in there to make a mark. What I ended up doing was just tracing the outsides of the holes where the screws will be inserted. Then I found the center of those

holes, and drilled there. The lane guides use #6 machine screws, so I drilled 5/32" holes, 4 for each lane guide. Go ahead and attach the lane guides to the playfield using the holes you just drilled. A 2" long screw is just barely long enough to get through the lane guide and the playfield and attach a nut to, so you may want to use 2 1/2" or 3" screws if you have them available. However, the screws right next to the flippers may interfere with the flipper brackets if they are too long, I ended up keeping the 2" screws in those locations. Once you have everything screwed down, go ahead and take a picture of your playfield like the one I provided below, it is amazing how much getting flippers and lane guides on makes this thing look like a real pinball machine!

Lets get going now on setting up our slingshot area, which includes the triangular portion that we will put a rubber around, as well as the slingshot assembly itself which sits inside the triangle. Remove the flipper bats and flipper assemblies, but leave the lane guides on. A little sawdust isn't going to hurt our plastic lane guides, and we will be using them for positioning.

A standard pinball is 1 1/16" diameter, so any place the ball travels needs to be at least that wide. In looking at T2 and Lethal Weapon 3, it looks like the spacing between the vertical part of the lane guide and the vertical part of the triangle is a little bit less than the spacing that is used between those two once they start to angle downward toward the flipper. I am going to be using 1 1/4" spacing for the vertical part, and 1 7/16" spacing for the angled part, sort of taking the average between the spacings on T2 and LW3 (LW3 uses a bit wider spacing than T2).

Using my ruler, I drew a vertical line that is 1 1/4" away from the vertical part of the lane guide by measuring two points that were 1 1/4" away from it and connecting those two dots. I followed a similar procedure for the angled portion, measuring two points 1 7/16" away from the lane guide and drawing a line that connects them. Make sure you draw the lines long enough so that they intersect. The position of these two lines is approximately where our rubber will sit once we get that put on.

To support the rubber band that will sit around this triangle, I will be using "star posts" (3 per side) available from Pinball Life.

pbl_03-8319-xx Plastic Translucent Star Posts 1-1/16" Tall
Options:
Choose A Color : Clear $0.36

I wanted the center of the first star post to be lined up with the screw holding the top of the lane guide in place. Grab a star post and position it vertically so that the screw hole is in line with the top of the lane guide, and horizontally so that the edge of the star post is right up against the vertical line we drew earlier. Trace around the outside of the star post, the center of this circle is where our hole is going to be. The second vertex of our star post triangle is going to be where the vertical line and the angled line meet. Position your star post so that it touches both lines, and trace around the edge. The last post is a little tricky. Vertically, you want to position it so that it touches the angled line. Horizontally, first imagine that there is a vertical line going through the ball guide screw closest to the flipper. You want the center of the star post to be about 1/8" outside of this line (away from the center of the playfield). Once you have that one lined up, trace your last circle. Repeat for the other side. Before we drill these holes out, go ahead and mark a straight line between the center holes you marked for the top and bottom star posts, this will help us later when we go to make our slingshot holes. For reference, we will call this line S1. The star posts use #8 screws, so drill your holes using a 3/16" bit.

While we are drilling and what-not, lets go ahead and make our slingshot holes. I am using a Stern slingshot assembly that I got from Pinball Life.

500-5849-00 Data East/Sega/Stern Slingshot Assembly
Options:
Choose A Coil : 23-800 "090-5001-00" $44.95

The same assembly is used on the left and right sides, so you don't need to worry about that. Again I chose the option of the more powerful coil, understanding that I can tune its power later in my machine yaml file.

The slingshots need 3 holes cut in the top of the playfield, two for the switches and one for the slingshot arm. The two switch holes are circles with a 1/2" diameter. The slingshot arm fits in to a groove that is 1/2" wide and about 1 1/2" long. I am positioning my assemblies so that the arm will be directly in the middle of line S1 (that we drew between our top and bottom star posts). Using a ruler, make a mark directly in the middle of line S1. Now make a mark 1 1/16" on either side of that center mark along S1. From each of these two side markings, make mark 1/8" away from the line (toward the center of the playfield), at a 90 degree angle to the line. These marks are going to be the centers of our slingshot switch holes. Go ahead and drill a 1/2" hole for each.

A quick note before we go forward, I do not currently have a router, which means a lot of these non-circular holes are going to be kind of odd using my construction method. If you have a router, feel free to use it here instead of the drill instructions I give below.

Now we need to make the hole for our slingshot kicker. From the two switch holes we just drilled, make a line between the tops of the two holes (the edges closest to the center of the playfield), which we will call S2. This line should be parallel to line S1. Draw a line at a 90 degree angle from the midpoint of S1 (that we found earlier) through S2, which should bisect the middle of S2. We will call this line S3. Where S2 and S3 meet is going to be the center of the front part of our slingshot hole. From this intersection, measure back along S3 (away from the center of the playfield) and make a mark 1" from the intersection of S2 and S3. This will be the center of the back part of our slingshot hole. Drill 1/2" holes at the holes you marked for the front and back of the slingshot kicker. Now, make one more mark between these two holes along S3, and drill one more 1/2" hole. Now comes the fun part. We will use a file to shave down any remaining wood between our front and back slingshot holes, so by the time we finish we should have a relatively smooth slot for our kicker to function in. See the attached picture for the example of what I did. The filing took about 5 minutes per side, so hopefully I won't have to do too many of these by hand.

Our last drilling for the day is going to be for some lamp holes that will stick up in to the slingshot area, and up into our ball guides. These are going to be 1/2" diameter holes for the short #44 sockets that I referenced in an earlier post. For the lamps in the slingshot area, just pick two spots in each slingshot area that won't interfere with the other holes you have drilled. It may be tight, but you should be able to make them fit. For the ball lane guides, assuming that you still have them on at this point, use a pencil to make a mark in the middle of each of the two larger holes. Remove the ball lane guides from the playfield, and drill 1/2" holes using those marks as your center. At this point you should have nothing attached to the playfield, but there should be a bunch a pretty holes just waiting for action!

In the next installment we will get all these parts assembled on to the playfield, and maybe (just maybe) we will start to see some balls in motion.

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« Last Edit: September 04, 2012, 12:09:16 PM by JoeShabadu2000 »

Logged

Steve S

FPGA_testers

Posts: 434

Steve Shoyer

Re: Prototype Whitewood Project

« Reply #18 on: September 04, 2012, 01:14:17 PM »

Quote from: JoeShabadu2000 on September 04, 2012, 12:04:38 PM

> I don't know if it is my drill bit or what, but my "exit holes" from the MDF are atrocious, the underside of my playfield is pretty ripped up. If anyone has suggestions about bits to use that will make a nice clean exit hole, please let me know. I don't think it will affect my build too much, but it sure is ugly and takes extra time to clean up after I have drilled the holes. Until I can get this part figured out, I am going to be sure to drill all my holes from the top to the bottom, that way the top of the playfield stays clean.

If you clamp a scrap piece of wood or MDF under your playfield where you will be drilling, then drill through the playfield into the scrap wood, the exit hole will be much cleaner.

--Steve

Logged

JoeShabadu2000

Wizard

Posts: 118

Re: Prototype Whitewood Project

« Reply #19 on: September 04, 2012, 01:55:43 PM »

Thanks for the tip on the MDF drilling, Steve, I'll give that a shot next time and let you know how it goes.

Logged

Steve S

FPGA_testers

Posts: 434

Steve Shoyer

Re: Prototype Whitewood Project
« **Reply #20 on:** September 04, 2012, 07:02:39 PM »

Also, if you use spade bits for larger holes (like this one), the outer edges will cut through before the center, so the hole is a lot neater, as long as you're not pushing too hard on the drill.

Logged

JoeShabadu2000

Wizard

Posts: 118

Re: Prototype Whitewood Project
« **Reply #21 on:** September 08, 2012, 11:09:49 AM »

I have spent the past few days doing some wiring and testing.

I forgot to mention in the last post, but while you have your drill out, go ahead and mark and drill your pilot holes for the slingshots. I also drilled a few pilot holes for the #44 lamp sockets referenced in a previous post, these will be placed in the slingshot area and in the ball lane guide area.

Get all your sawdust cleaned up as best you can, and start getting your playfield pieces put back on. I would recommend starting with the lane guides, then do the flippers, then mount your slingshot assemblies (using the #6 hex head wood screws), then attach your star posts (using #8 machine screws and nuts). Flip the playfield over so you are looking at the top, and put a 2 1/2" rubber around the slingshot area, mounted on your star posts.

At this point you may need to adjust the leaf switches on your slingshot assembly, depending on how close they are to the rubber you just mounted. Just push the metal tabs on the leaf switch closer to the rubber, or move them away, depending on how sensitive you want your slingshot to be.

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CIMG0532 (Copy).JPG (177.34 kB, 1024x768 - viewed 594 times.)

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Logged

JoeShabadu2000

Wizard

Re: Prototype Whitewood Project
« **Reply #22 on:** September 08, 2012, 12:53:29 PM »


Posts: 118


So now that everything is mounted, let's get this thing wired up. Hopefully this goes without saying, but make sure that the power is off to your P-ROC and your Antek power supply before doing anything with your wiring. The voltages involved here are potentially dangerous, safety first!

I started with the coils. Per Gerry's advice, I removed the diodes from my coils (except for the flippers), since the PD16 has diodes built in to it. Hooking up the power to the incorrect terminal on a coil with a diode can cause the PD16 to blow, so I figure it is better to be safe than sorry.

The slingshot coils have two terminals. Once the diodes are removed, the polarity with which we hook up our power and sink wires doesn't matter. One terminal on the coil will be for power, and the other terminal will be our sink. The power is going to come from the power out section of our P-ROC. In my case, I am using bank A for power for all of these coils, so I am connecting a 70V power out from terminal J3 on the PD16 to one of the terminals on the slingshot coil. J3 is another 3 pin Molex connector, you should be familiar enough with that connection at this point.

In the photos below, the yellow wire is my 70V. As you can see, I have "daisy chained" the power to each of the other coils, so that I only have one 70V wire leading from the PD16 to my first coil, then a shorter wire to connect the power to the next coil. Each bank on the PD16 has two power output connectors, but they run through the same fuse, so you can hook the coils up to power however is most convenient for you.

When wiring up your Williams flipper assemblies, you will note they have 3 terminals, be sure to pay close attention to the terminal that you connect the power to. You can read much more about this on the wiki page and in the fourms. These flipper assemblies need to be hooked up properly or they will not function as intended. You want to hook your 70V up to the "common" terminal, which will be the terminal on the left hand side if you have positioned your assemblies like I have shown in the photo. The "power" terminal is in the middle, and the "hold" terminal is on the right. To confirm this, use your multimeter to determine the resistance between the common terminal and the power terminal. It should be 4 ohms or so. If it is closer to 130 ohms, then you have misidentified your terminals, this is the resistance between the power and hold terminals. Once you have identified the common terminal for each flipper, go ahead and hook up your 70V wire to it. Connect your last slingshot to the power line as well.

Now we have all 4 coils hooked up to power, we need to connect them to the sink section. Since we are using Bank A on the PD16, we will connect the other end(s) of our coils to connector J7, which is a 10 pin Molex connector. Pin 2 is blank, so don't put any wires in there. We will need two connections for each Williams flipper (one for power and one for hold), and one connection for each slingshot. It is a good idea to use different colored wire or different colored shrink tubing so that it is easy to identify which connection on the coil corresponds to which connection on the PD16. We can change all of the mapping for these connections in the software, but you have to know which coil is connected to which terminal on the PD16 for that to work. I have connected my coils to the following pins (along with their corresponding output number in your machine yaml file):

1 - output 0 - Right Flipper Power
3 - output 1 - Right Flipper Hold
4 - output 2 - Left Flipper Power
5 - output 3 - Left Flipper Hold
6 - output 4 - Left Slingshot
7 - output 5 - Right Slingshot

We can connect our switches now. To connect switches, we can use either the direct inputs, or the matrix inputs. For right now, I am only going to use the direct inputs. This eliminates the need to include a diode on each switch. The direct inputs look for a connection to ground, and when the input senses it has been connected to ground, it registers the switch as being closed. So, each switch we have hooked up to a direct input needs one side connected to ground.

I am going to be hooking my switches up to the "Stern" inputs on the P-ROC. Direct inputs 0-7 are located on connector J6 on the P-ROC, which is a 10 pin Molex connector. The numbering of these inputs is backwards from what you might expect, input 0 is at pin 9, input 1 is on pin 8, etc., so please be sure to keep aware of this as we are connecting our switches. Pin 10 is ground, and we will be using pin 10 to provide our ground signal for these switches. We can "daisy chain" the ground wire between our switches, in a similar fashion to how we connected the 70V wire to our coils.

We have a total of 4 inputs to wire up, one for each flipper button and one for each slingshot. Each slingshot has two leaf switches connected to it, but we don't need the P-ROC to distinguish between the top and bottom slingshot switches, the idea is that when either switch is triggered the coil will fire. So, we will connect the top and bottom slingshot switches together before we connect them to the rest of the circuit. Use a short wire to connect the rear terminal of the top switch to the rear terminal of the bottom switch, and use another short wire to connect the front terminal of the top switch to the front terminal of the bottom switch. Now, there will be one switch event that gets triggered whenever either switch is pressed.

Make a connection to ground (through pin 10 of J6) on one end of each flipper switch, and at one of the terminals on each slingshot. It doesn't really matter which end of the terminal you hook up the ground wire to, but in my build I am using the rear terminals (farthest away from the center of the playfield) for the ground connections.

Now we need to hook up the other end of each switch to an input on the P-ROC, through connector J6. You will need a separate wire for each switch. I have connected my switches to the following pins (along with their corresponding input number in the machine yaml file):

6 - Input 3 - Left Slingshot
7 - Input 2 - Right Slingshot
8 - Input 1 - Left Flipper
9 - Input 0 - Right Flipper
10 - Ground

You will need to make sure to update your machine yaml file to reflect these changes, these inputs are different than the ones that were included in the example I posted previously. Please be certain especially that you are referencing the correct Bank for the PD16 in your PRCoils section, you want to be using Bank A (0 in your yaml file) if you have hooked things up as I described above. Any Bank that is not defined in the yaml file will connect directly to ground as soon as you execute a program, which will cause all your coils to fire and your fuse to blow.

The following is the updated machine yaml file I am using (simple.yaml):

Code: [Select]

```
# P-ROC Game Description file a sample machine using PDBs (PinballControllers.com Di
PRGame:
    machineType: pdb
    numBalls: 4
```

```
PRFlippers:
    - flipperLwR
    - flipperLwL
PRBumpers:
    - slingl
```

Once you have your yaml file correct, you should be able to turn the power on to the P-ROC and your Antek power supply, and run the same sample.py program referenced in an earlier post. Hit the flipper switches, and the flippers should activate. Push on your slingshots, and they should fire.

Here is a video of my first flips:

http://youtu.be/xaJNB0B9-po

Having the playfield rotate is kind of fun, I wonder if there is any way to turn that in to a game mechanic somehow?

It seems to me like I don't really have enough space on my inlanes, the ball has a hard time getting in. I would estimate right now that I only have about 1 1/8" total in the gap, which is just large enough for the 1 1/16" pinball to get through. The rubbers are slightly larger than I was planning for. If I was doing it again, I would probably put another 1/4" between the edge of the slingshot triangle and the vertical portion of the lane guide.

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CIMG0540 (Copy).JPG (196.08 kB, 1024x768 - viewed 502 times.)

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« Last Edit: February 10, 2013, 09:11:20 PM by JoeShabadu2000 »

Logged

Gerry Stellenberg

Administrator

Posts: 2399

Re: Prototype Whitewood Project

« **Reply #23 on:** September 08, 2012, 07:55:54 PM »

Nice to see your flippers/slings working. I agree, there's interesting potential for a rotating playfield.

Quote from: JoeShabadu2000 on September 08, 2012, 12:53:29 PM

> Please be certain especially that you are referencing the correct Bank for the PD16 in your PRCoils section, you want to be using Bank A (0 in your yaml file) if you have hooked things up as I described above. Any Bank that is not defined in the yaml file will connect directly to ground as soon as you execute a program, which will cause all your coils to fire and your fuse to blow.

The issue is unfortunate, but it's not quite THAT bad (as evidenced by your coils not firing when your PDB's board address was not defined in the YAML). The exact issue is that the default polarity of uninitialized drivers is the opposite of what the PDBs expect. When either bank of a PDB is initialized by software, an internal PDB-reset signal is released. If either bank is completely unitiialized (ie. no drivers are defined in the YAML for a bank), the drivers in that bank are disabled according to the default polarity. Since the default polarity is wrong, the drivers activate.

To avoid this, the software framework, whether pyprocgame or something else, should initialize both banks of a PDB if any driver in either bank is configured. I'll see about making this change to pyprocgame's pdb.py when I get some free time.

- Gerry

Logged

JoeShabadu2000

Wizard

Posts: 118

Re: Prototype Whitewood Project

« **Reply #24 on:** September 17, 2012, 08:51:33 AM »

After doing some serious thought, I have decided to abandon my hand drilled playfield, and am in the process of getting converted to a CAD / CNC process. The prospect of having to redo all my drill holes every time I want to change something was just too much. Also, I think it will be beneficial to get a design (of some sort) finalized, that way I can know all the locations of the switches, coils, and lamps in advance so that the wiring process won't be quite so insane.

I'm still early in the process, but I have been able to test fit some parts based on my CAD drawings of them, seemed to turn our pretty well. I have some more items coming in later this week, and I need to make a few tweaks to my drawings, but I will post my CAD blocks once I'm satisfied that they are good. In the meantime, a few pictures of my test fitted parts and the empty board. My pilot holes weren't deep enough so I have some mushrooming on those surfaces, I have a new end mill bit coming later this week that should help with that.

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CIMG0544 (Copy).JPG (174.59 kB, 1024x768 - viewed 444 times.)

CIMG0545 (Copy).JPG (152.88 kB, 1024x768 - viewed 477 times.)

CIMG0546 (Copy).JPG (142.39 kB, 1024x768 - viewed 455 times.)

Logged

lachied

P3 Developers

Posts: 296

Re: Prototype Whitewood Project

« **Reply #25 on:** September 17, 2012, 11:22:14 PM »

Keep the posts coming!!
Im going to be starting my own soon and I dont have any reference machines so all the information I can get will be great. Funds are a bit limiting for me so Ill probably look to do as much of the planning preliminary layout as possible up front.
Hopefully I can go into it knowing all my drill holes and how to wire up the devices first time.
I was thinking that an exploded view of each of the devices e.g. flipper assembly, would be really cool/useful. I might give that a go...

Logged

-- Lachie

Game of Thrones Machine

Blog
Photo Feed

JoeShabadu2000
Wizard
Posts: 118

Re: Prototype Whitewood Project
« **Reply #26 on:** September 18, 2012, 11:28:55 AM »

Glad to hear it is useful to you lachied. You can actually do quite a bit with the P-ROC software before you even get the hardware by using FakePinProc, so you can start learning how to do the programming or whatever.

My CAD drawings are 2D only and are really geared toward making sure the holes are placed correctly and that no parts overlap, so if you want to do an exploded drawing or something using a 3D package that would be awesome. I have a few new parts coming in and I need to do some more tweaks of my existing parts, but hopefully I'll have some CAD blocks up later this week. I do have the CAD blocks for the flippers attached to this post if that is any use to you in the interim.

Logged

Steve S
FPGA_testers
Posts: 434
Steve Shoyer

Re: Prototype Whitewood Project
« **Reply #27 on:** September 18, 2012, 06:19:32 PM »

Quote from: JoeShabadu2000 on September 17, 2012, 08:51:33 AM

> My pilot holes weren't deep enough so I have some mushrooming on those surfaces, I have a new end mill bit coming later this week that should help with that.

I'm guessing that the mushrooming is caused by the MDF rather than the depth of the pilot holes. When I did a playfied swap using a NOS playfield a few years ago, there were no pilot holes in the plywood for the screws, just small dimples where the screws were to go.

The thickness of the board might also be an issue, if you are using the same screws that were used in the 17/32" board. I was planning on using the CNC machine with a surfacing bit to get the plywood to the right thickness before cutting the rest of the holes.

--Steve

Logged

JoeShabadu2000
Wizard
Posts: 118

Re: Prototype Whitewood Project
« **Reply #28 on:** September 24, 2012, 11:34:16 AM »

Just to keep everyone up to date, I've continued working on my pinball part CAD blocks, and I'm still waiting for a few parts to come in so that I can get them measured and test fitted. However, I have decided to release all the blocks that I have developed so far, I have tested these on a CNC and everything appears to be spaced properly. If anyone notices any errors please let me know. I have included each block in both DWG and DXF (version R14) file formats. These were created in DraftSight, which you can download for free, if you need to convert to another format, or take measurements or whatever. The attached file contains the following elements:

Ball Inlane Guide (left) - 550-5037-01 (mirror to get the right inlane)
Ball Lane Guide Top Double Sided - 03-7034 - and Star Posts - 03-8319 w 5-16 in rubber
Flipper - Williams A15205 (left and right included)

Magnet Bracket A-15257 and Magnet Coil 20-9247
Rollover Switch and Bracket A12688
Pop Bumper Assembly Williams Bally
Narrow Plastic Post 03-8365 w 3-16 in rubber
Slingshot Assembly - 500-5849-00
Stand Up Target Rectangle 1 1-16 in - B-12001-4
Star Post - 03-8319 - w 2 1-2 in rubber (for slingshots)
Star Post - 03-8319 - w 5-16 in rubber (on its own or with top lane guides)
Star Post - 03-8319 (no rubber)

Pinball Component CAD Files - 09-24-12.zip (411.36 kB - downloaded 227 times.)

Logged

JoeShabadu2000
Wizard
Posts: 118

Re: Prototype Whitewood Project
« **Reply #29 on:** October 17, 2012, 09:29:55 PM »

I was just checking this thread and realized it has been several weeks since I posted, so I figure I should give a quick update. I have been working with the CAD files for a while now, it takes an incredible amount of time to think through everything that you need to, and I'm sure I have missed something important somewhere. Anyway, I feel like I am just about ready to use the CNC router to get my first revision produced. I have attached a photo from DraftSight with the current design. Barring a few tweaks here or there, this should be the version that gets routed. I will post the CAD files and some more detailed explanations once I can be sure they don't have anything crazily wrong with them after I run them through the CNC.

pinball playfield - design (rev 1).jpg (79.51 kB, 463x762 - viewed 2328 times.)

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