The Making of Sharpe Shooter III

Sharpshooter
1979

Sharp Shooter II
1983

Sharpe Shooter III
2015

Open Pinball Project

Introduction

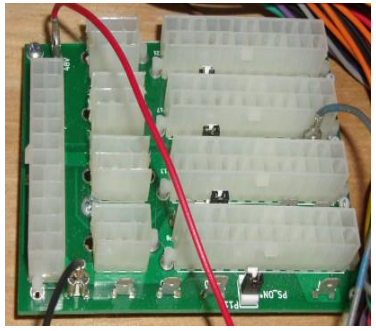
- Talk is centered on SharpeShooter III
- Project was created as extension of Open Pinball Project
- Forced OPP to a more complete state more quickly
- Impossible to discuss SS3 without discussing OPP because it utilizes the hardware, framework, and code generator

Open Pinball Project

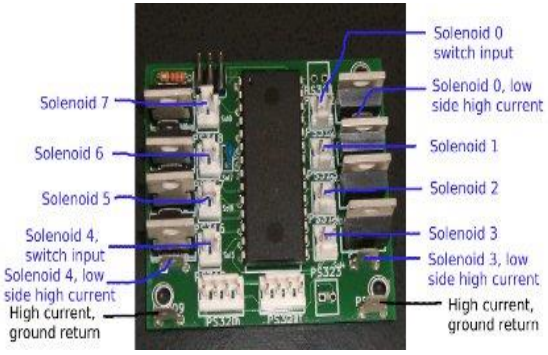
- Provide complete electronics solution for pinball machine
- Completely open source including PCB designs, embedded firmware, and pinball framework
- Leverage inexpensive processors for real time control
- Does not try to be a drop in replacement for any other board
- Targetted? towards homebrew pinball
- The one and only truly open source pinball project

Open Pinball Project (cont.)

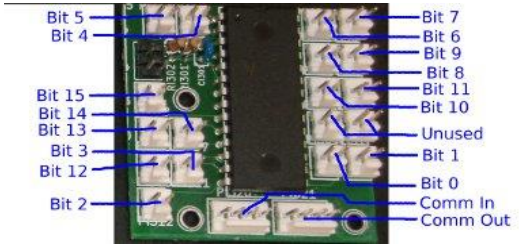
- Contains four boards
- Open source repository contains schematics, layouts and Gerbers in Kicad (PCB layout tool)



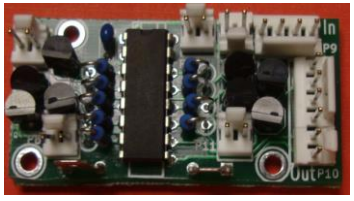
MaxPwr



Solenoid Driver



Input Driver



Incandescent Driver

Open Pinball Project

Open Pinball Project (cont.)

- Actively flipping three machines
  - SharpeShooter III
    - https://openpinballproject.wordpress.com/
    - YouTube - openpinballproject
  - Blue October – Joe (ToyotaBoy's project)
    - http://homebrewpinball.blogspot.com/
  - Bulls Eye 301
    - YouTube - kerform

Open Pinball Project

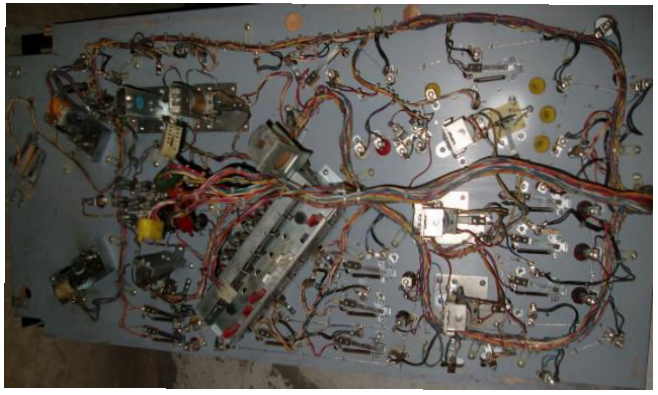
What Ever Happened To...

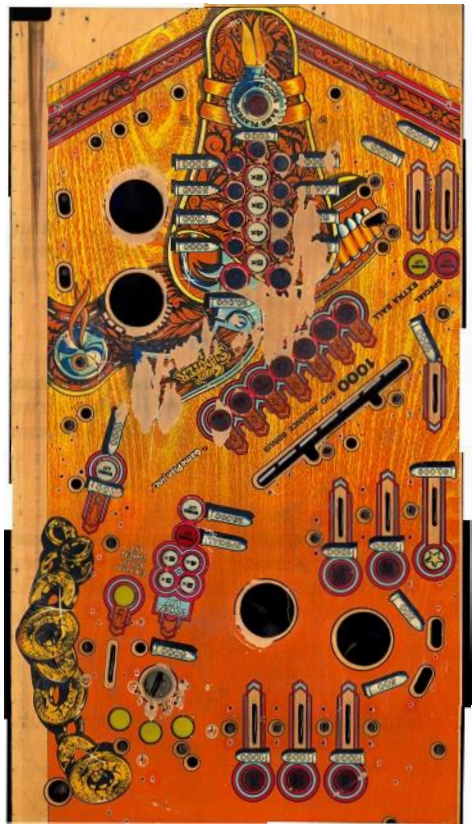
- Disaster
  - Narrow body machine with tornado at top center
  - Created visual pinball layout
  - Contained many novel concepts:
    - Change slope of playfield depending on mode/difficulty
    - Change angle of playfield
    - Auto leveling
  - Decided custom layout would slow project too much
- Backpack pinball
  - All mini-pinballs I've seen don't have correct feel

Open Pinball Project

Sharp Shooter II

- Purchased playfield 5/8/2014 for $75
  - Not a fan layout
  - Major wear so not destroying good game
  - Designed by Roger Sharpe





Open Pinball Project

Starting Conversion

- Strip bottom of playfield of all wires
  - Distributed system so wires end beneath playfield
  - Locate solenoid cards
  - Locate input cards
  - Create a route map of wires between cards
- Strip top of playfield if re-doing art
  - Remove everything that sticks out of playfield
  - Playfield divided into six sections and parts kept separate
  - Take lots of pictures, so it can be reassembled

Open Pinball Project

Scanning a Playfield

- Used HP-4600 flat scanner (inexpensive on Ebay)
  - Overlap each scan 30% or more
  - Scan playfield in rows
  - Directions on website on getting old scanner to work on Windows 8
- Use Microsoft ICE (Image Composite Editor)
  - Use ICE to make complete rows
  - Combine all rows to form complete image
  - Reduces amount of twisting/rotation by program

Open Pinball Project

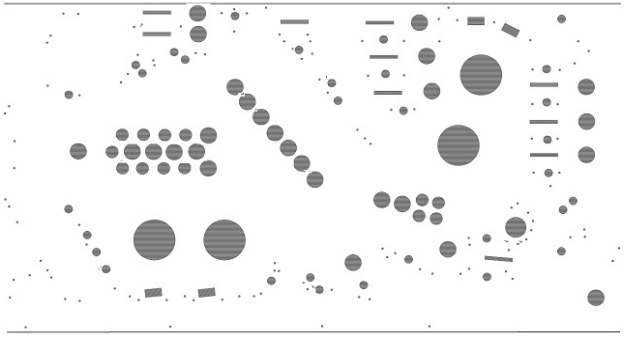
Create Whitewood

- Sand down the top of the playfield
  - Built pinball rotisserie to hold playfield
  - A Random orbital sander is your friend
  - Restore any issues with playfield
    - Bamboo skewers to fill holes
    - Reseat inserts if not flat
- Paint playfield white if using clear vinyl overlay
  - Required so inserts are brighter
  - Mask off inserts and areas of bare wood

Open Pinball Project

Create Template

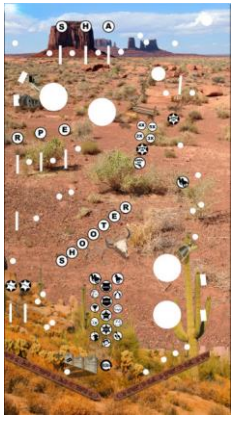
- Templates are required if creating new art
  - Allows art to be positioned appropriately
  - Shows locations of all features
  - Can be printed inexpensively to verify template
  - Verifies overlay matches playfield

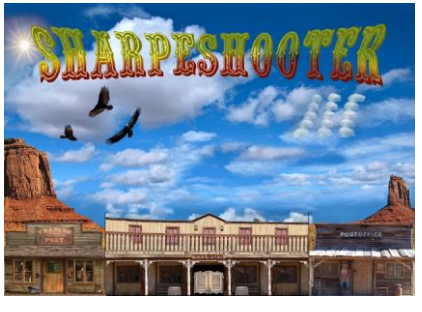


Open Pinball Project

Art and Sounds (it's all Joe)

- Started working with Joe as alpha site for hardware
- OPP supported his project providing boards
- Joe provided:
  - Cabinet art
  - Backbox art
  - Playfield art
  - Monitor art
  - All game specific callouts





Open Pinball Project

Preparing the Cabinet

- Prep the Cabinet
  - Sand sides flat
  - Fill dings with wood putty
  - Use a base coat of paint
    - Must be white if using clear overlay
  - Sand, sand, sand
    - Imperfections are very noticeable
- Use wet method to apply overlay
  - Spray with water and couple drops of detergent
  - Allows overlay to be repositioned

Open Pinball Project

Woe of the Frankenstein Machine

- Lockdown bar did not match playfield
- Coin door did not fit in cabinet
- Backbox did not attach to cabinet
- Glass interfered with lockdown bar
- Side rails did not match flipper button holes
- Cabinet work took much longer than expected
- Many parts were fabricated to make things work

Open Pinball Project

Autoclear – Not as bad as you think

- Time was running out
  - Varathane cure time is about 2 months
- Auto clear – start to finish (1.5 weeks)
  - Painting, 1 day per coat (5 days)
  - Hardening day, 1 day
  - Sanding, 2 – 4 days
    - Wet sanding keeps sandpaper from clogging (but messy)
    - Used 600, 1200, and 2000 grit sandpaper
    - Brush worked better than expected (sprayer would be best)
  - Repopulated playfield < 2 weeks

Open Pinball Project

Autoclear – Scary Stuff

- Exposure issues include:
  - Blindness
  - Brain damage
- Safety equipment needed:
  - Respirator (prevent organic vapors)
  - Swim goggles
  - Not in the house

Open Pinball Project

Finishing Up

- Reassemble playfield
  - Remember all those pictures, now they pay off
- Clearcoat cabinet with polycrylic (can be done inside)
- Start playing machine
  - Non-volatile config allows machine's flow to be tested
  - PinBrdGui shows output of switches continuously

Open Pinball Project

PinballFramework

- Python Based framework
- Auto creates hardware map using config file
- Supports multiple rulesets
- Has simulation mode so code can be written in parallel with playfield development

Open Pinball Project

What did it Cost?

- Playfield, $75
- Cabinet, $50
- Backbox, $30
- Driver/Input Cards, $50
- Power Supplies, $50
- Art, $150
- LEDs/parts, $130
- Monitor, $80
- Old PC, free
- Total - $615

Open Pinball Project

Restoration Throwdown Contest – Vote for Me

- Spirit of the hobby
  - Discarded waste, back to playing machine
- Restoration – swapping playfields
  - What are you restoring when you replace the playfield?
- Retheme
  - Usually only change art and add sound triggers
  - SharpeShooter III has 11 modes and 4 different levels
- The playfield has been restored to fully playable machine

Open Pinball Project

RTC – Vote for Me (cont.)

- What if SharpeShooter III wins?
  - 50% cash goes to Joe for all his hard work
  - Rest of cash get split amongst:
    - Clay – aka PinballNinja
      - Without his website much of this would not be possible
      - The definitive source of info on pinball restoration
    - Pinside – answering the arcane questions
      - Providing a search engine to answer most questions
      - Telling me where to find pinball when stuck on a business trip
      - Forum for people answering any question you have on any machine you need the answers

Open Pinball Project

Questions?