GameRoom

Your Guide to the Ultimate Home Game Room

May 2009 Volume 21, Number 5

www.gameroommagazine.com

$5.95

GameRoom, Unplugged

Not all games need a cord

The Many Incarnations of Star Wars

Read this, you must

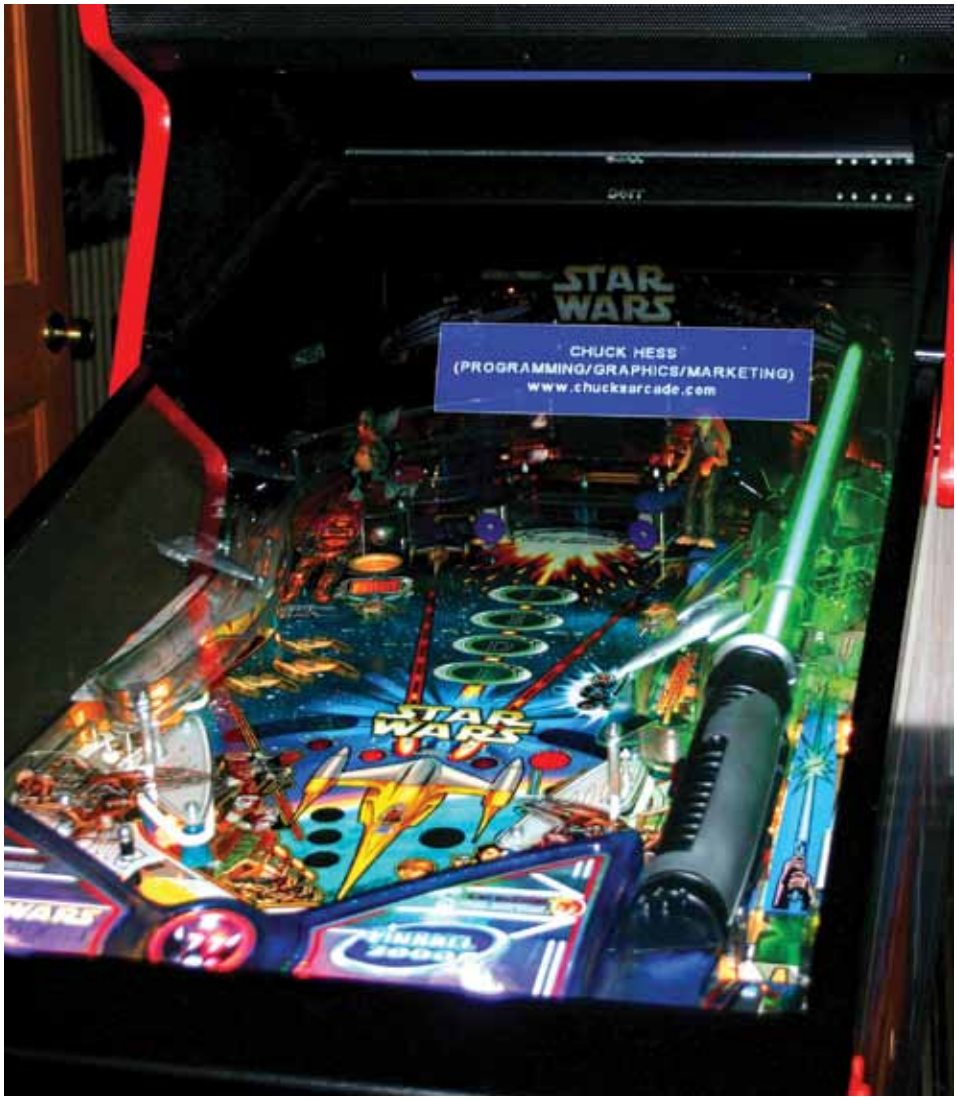
Rob Craig's

Tales of the Silverball

NuCore – More Than Just Preserving Pinball 2000

Here are some straight-ahead points for anyone that hasn't paid much attention to the last Williams machines that were made before the WMS corporate big shots killed off pinball: Pinball 2000 remains the most advanced pinball system ever made. Nothing that has been produced since (even by Stern) can even remotely touch the innovations that were implemented in *Revenge From Mars* and *Star Wars Episode I*. The second big deal is that all of these innovations fail to function as a machine unless something *big* can fix the weakest link to the Pinball 2000 system—the PC-based computer.

nucore™



Looking Back

Revenge From Mars (RFM) contained the single largest number of pinball improvements in any system upgrade, by any manufacturer. There are articles, recorded interviews, even a DVD that charts the Pinball 2000 story. If you haven't read, heard, or viewed any of the material, you should know that the pinball designers were forced to re-invent pinball or walk away from Williams Pinball completely. Everyone related to designing a machine: programmers, playfield designers, gadget inventors, and artists, had careers at risk. What came out of this whirlpool of high-end engineering talent was nothing short of amazing. When Revenge From Mars was first released to the public, operators and distributors knew this was a very different game. They were excited for the first time in a long time, about a pinball system that had the potential of bringing back some energy to the coin-op market. Sales of RFM were the highest the company had seen in 5 years. The second title, Star Wars Episode I (SWEP1 or SWE1) followed suit. While it's understandable to ponder the

reasons why these were the only two titles produced on the Pinball 2000 system, and ultimately the end of WMS Pinball, this article seeks only to provide an insight into what we can do to keep our Pinball 2000 games running for years to come.

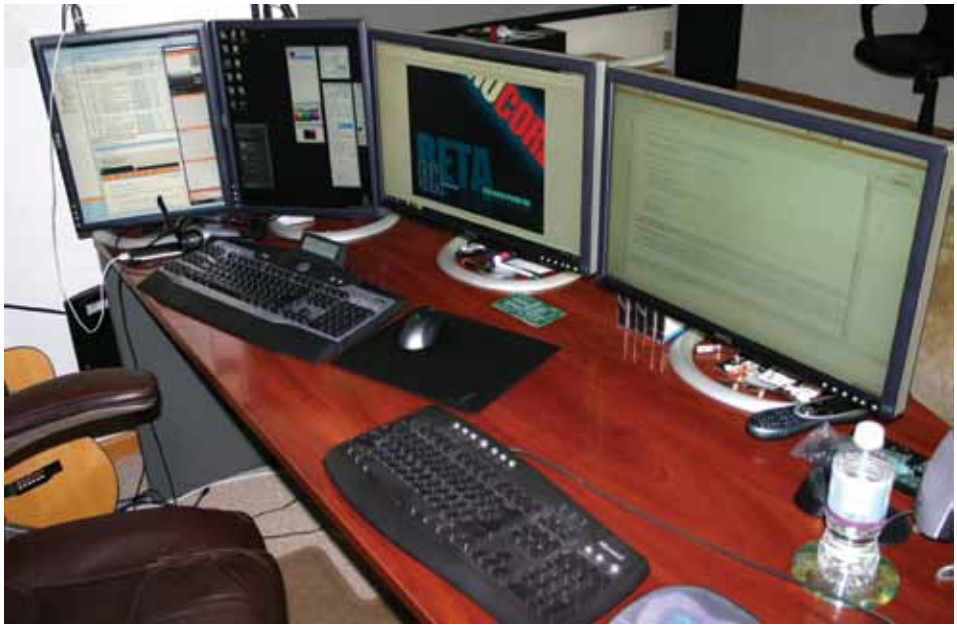
Electronically, Pinball 2000 was a completely new system. Previously, the circuit boards used to run a pinball machine were based upon simple microprocessors and common components. But, with Pinball 2000, the main electronics system was basically a personal computer, with computing power that went far beyond that of previous systems. Video is an integral part of Pinball 2000, and the PC-based system handles the delivery of graphics while also managing to monitor switches, lamps, and activate solenoids. The onboard PC also handles the stereo sound system. It's the most robust of any pinball machine before (and since).

While RFM was on the production line, another team was finishing up Star Wars Episode I. Shortly after its release, the leadership at Williams decided to end pinball production, despite the incredible re-invention of the machine through Pinball 2000 and its strong potential. Other games were in development at the time. Pat Lawlor and his team were working on an unlicensed title called *Wizard Blocks*, while another crew had just began work on a Pinball 2000 version of Playboy. These projects ended abruptly with the close of the pinball division.

It's important to know that the Pinball 2000 system was built to be modular. With SWEP1, an operator or collector that already owned an RFM could purchase a SWEP1 kit to convert their machine. The kit came with a playfield, translite, game, cabinet graphics, ROMs, and for this title, a shooter. The playfields are very easy to remove and replace. Within an hour, an RFM can become a SWEP1. It's entirely possible that the majority of all Pinball 2000 machines and playfield kits that are running today are in the hands of collectors.

Here's Your Problem ...

It's hard to believe the last Pinball 2000 machines produced are going to turn 9 years old soon. With electronic pinball machines that are 20 years older, the electronic systems that make them operate are repairable. Currently, there are many replacement circuit boards that promise an extension of life for our prized pinball possessions. Many of these reproductions are quite a bit better then the original stuff. In fact, some actually add features to the game. But with Pinball 2000, the complexity of the system and its outdated PC-based motherboard used spell certain death for the thousands of RFM and SWEP1 games that we own. The problem starts with a processor that has been obsolete for several years, and technologically "old school" from the beginning of the Pinball 2000 development. Beyond that is a unique motherboard that was specific to Pinball 2000. One would think that Pinball 2000, being a PC-based system, could somehow be ported over to another PC of modern specs without issue. But this is not the case, as you will see. Pinball 2000 machines are dying, and there aren't any more of the needed PC parts to be found. Anything related to the computer hardware in this system fetches amazing prices on eBay. There might have been a plan to update the Pinball 2000 PC-based hardware, but it seems that when the doors of Williams Pinball closed, so did any hope of a solution...that is, until now.



"Don said 'Why couldn't we emulate this? It looks simple enough.' Those were famous last words. Two and a half years later, and a lot of pain and suffering and...here we are."

NuCore is Born

Chuck Hess and Don Weingarden are true fans of the Pinball 2000 system. They like pinball, a lot! And thankfully, these guys are also talented IT guys. As Chuck tells the story, "Don and I were standing in my basement arcade in front of my RFM, and Don said 'Why couldn't we emulate this? It looks simple enough.' Those were famous last words—2 ½ years later, and a lot of pain and suffering and...here we are."

So, almost 3 years ago Chuck and Don combined their talents, and began work on dissecting the Pinball 2000 system. Both of these guys are extremists, unsatisfied with just talking about their ideas. Their relationship goes back many years and includes several IT centered projects including game software. While carefully assessing the scope of this project, Chuck realized that they would probably do well in finding additional people to join the team. They posted a request on the newsgroups that failed to gain any more serious partners. Through the old PinMAME forums, they read that Steve Ellenoff had found some apparent success with RFM and PinMAME. Finding Steve and gaining his trust was significant. He is one of the original four programmers that created the original

PinMAME emulator software in 2001. To understand the importance of this, you have to grasp a little about what an emulator actually does—it is software that has the ability to create an "environment" for code that looks just like the system the code was designed to run on. It reads original programs and communicates with them, fooling them into running just as they would in their original environment. In this case, the Pinball 2000 emulator that Steve had written was able to read the original data from the game software.

After understanding the amount of dedication that Chuck and Don had already established to the effort, Steve handed over the emulator. It hadn't been touched in a while, so Steve offered the new blood a shot at making it work correctly. Chuck explains what happened next.

"I took a look at the code, and what I immediately noticed is that it's pretty well written code, but it wasn't optimized. I knew if I spent some time, I could optimize it considerably, and that's what I focused on for a couple of months. I re-wrote the graphics pipelines, and re-wrote a lot of the internals. He (Steve) got excited after he saw (what we had done) so he started jumping back in. Steve and I focused on the software and Don focused on the custom hardware and the ROM readers." The trio continued to work towards a 100% working replacement system until discussions about potential legal issues surfaced. Steve took a departure from the project, while Chuck and Don continued onward, to work out legal details and solve some of the final issues with the software and hardware.

When the team ran SWEP1 on their emulator, a load of new problems surfaced. At Williams, there was a different design team working on the game. "When you have different programming teams working on something, you'll naturally have different ways of writing code to do things," explains Chuck. These differences were causing strange behaviors with the NuCore emulator. It took Chuck about four months to solve the biggest problem with SWEP1, but once complete, the NuCore system was successfully running both RFM and SWEP1.

With the emulator finally functional, there were other ideas they wanted to experiment with. Chuck and Don are both musicians, and love music. So, they added an MP3 jukebox feature into NuCore. They can add their MP3 collections to the NuCore system and have it play during attract mode. There are other things the team wanted to add to the system, including the ability to play video on the screen, and allow support for a tournament server.

Legally, both Gene Cunningham of Illinois Pin Ball and Wayne Gilliard of Mr. Pinball Australia have interests to be satisfied, in order for NuCore to produce a product that they could sell. While the history of reproduction pinball parts, artwork, and software has had a scattered trail of legal success, NuCore managed to successfully strike an agreement with all parties. One of the conditions of the agreement is that Pinball Life would be the exclusive distributor.

Installing NuCore

The NuCore product is made up of two components. There is the software emulator, and a small piece of hardware. One only needs to have a PC available in order to get started. The user will receive a Ubuntu Linux CD and the NuCore software. Once Ubuntu is installed, the NuCore software is installed. The small circuit board that comes with the product is then connected to the original Pinball 2000 parallel cable (that feeds data to the Pinball 2000 driver board) on one side, and then connected to a USB port of the PC you've installed NuCore on. Once this is complete, your PC can be booted up. NuCore will know which playfield you have installed (RFM or SWEP1) and boot the relating software. You get the jukebox software as a bonus.

The cost of the software and USB board is $400. Add a basic PC at $200-$300, and you're up to $600-$700, unless you already have a suitable PC to re-purpose for NuCore. It may seem pricey, but if you were looking for an old working Pinball 2000 PC with a PRISM Card, you can expect to pay more than $600 on eBay. There are more things to consider. If you want to keep the original CRT, you'll need an ArcadeVGA graphics card from Ultimarc (ultimarc.com) to get the video from the PC to talk to your arcade-style monitor. Or, you could save the cash on the video card and buy an LCD display to replace the current arcade monitor in your Pinball 2000 machine.

The Future Looks Bright from My Game Room

I can't help but to project that NuCore is onto something sweet here—there are a lot of products like this that we collectors actually need. When new circuit boards with improved technology arrive, I naturally get excited. For Pinball 2000, I was very concerned—I delayed my own RFM purchase for years, being afraid that it would fail and become a pinball carcass with no hope of resurrecting. I did end up buying an RFM, and later a SWEP1 kit. I'm lucky to have one that runs well today, but my years as an IT professional remind me that the PC could die on the very next power up. With NuCore debuting in July, I'm confident my Pinball 2000 machine will have the same chance as every other machine in my collection.

There is one other *BIG* point to all of this. Remember the Pinball 2000 titles that were in development when WMS Pinball closed their doors? Wizard Blocks was the one that came the closest to completion. It's currently preserved in a bare Pinball 2000 cabinet with a whitewood playfield. I've played the only machine known to exist, which is in Gene Cunningham's possession. While it doesn't have completed software, it does work with its basic rule set. I've been told that there is artwork for the playfield and cabinet. With NuCore's assumed ability to emulate the existing Wizard Blocks software, and its interface to potentially write game rules, I can hope for Wizard Blocks to someday become a Pinball 2000 kit. Sound crazy? It's closer to reality than you might think.

Big thanks to Chuck Hess, who spent a long time on the phone, sharing all kinds of techie info on Pinball 2000 and NuCore. Silverball Podcast listeners will be able to hear an extended interview with Chuck in The Silverball - Episode 12, coming soon. GR