

July 2010

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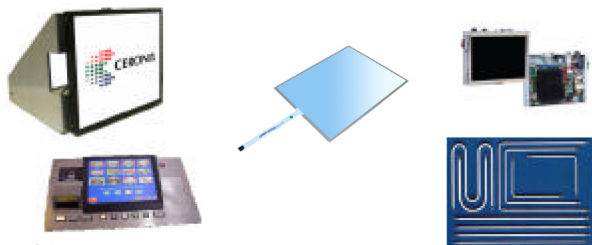
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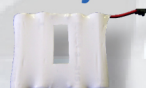


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Randy Fromm

Dear Friends of Slot Tech Magazine,

I recently received a rather mysterious, bulky envelope in the mail. The envelope was addressed backward, being sent to someone named "USA" at my address in El Cajon. The postage stamps were in Arabic but the envelope bore no return address other than one word:Libya.

Not trusting that the US Government had already cleared the envelope and that it wasn't a letterbomb, I asked my wife to open it for me while I found something to do behind the reinforced concrete wall of the shop. Inside the envelope, wrapped in five layers of paper towel affixed with black electrical tape, was a nice Casio watch (which my young Airedale Terrier subsequently ate) and a DVD containing 864 MB in 536 files, none of which were related to improvised explosive devices or jihad. Instead, it was (is) a remarkable collection of electronics documents, almost all of which relate to learning electronics and/or repairing electronics. The enclosed letter explained in broken but quite readable English that the sender had learned a great deal from some technical materials I had sent to him in the past and that this contribution (and the ill-fated watch) was his way of thanking me. I have only scanned a fraction of what he has sent but it is definitely worthy of your attention so I have put it up, unvetted, on the Technical Server. The URL is <http://bit.ly/atHOaE> or just go to the server at http://slot-tech.com/interesting_stuff/ and you'll see the obvious link to it. Your best bet is to use ftp and download it all as a batch because it is 536 files as I mentioned. Point your ftp client to slot-tech.com (not ftp.slot-tech.com). Username=Slot Tech Password=kxkvi8.

Enjoy!

A handwritten signature of Randy Fromm in black ink.

Randy Fromm - Publisher

Randy Fromm's Slot Tech Magazine

Editor

Randy Fromm

Technical Writers

Dean Auger, James Borg,
Vic Fortenbach, Chuck
Lentine, Kevin Noble,
Herschel Peeler, Pat Porath

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1944 Falmouth Dr.
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Trimline AVP Version 2.5 Keeps Rebooting

We were called to this machine because the game started to reboot all by itself. We first thought that the CPU could be overheating so we decide to check the fan. Once we verified that all fans were working properly, we next checked the filter just in case it was dirty or plugged. The CPU fan filter was as clean as a whistle. We powered off the game and then restarted to see if the game would come back up; we left it in service when it did. About 3 hours later, we received a call that the game was rebooting itself again. We had to power cycle the game because both monitors were blank and the game was not doing anything. Once the game came back to life I decided to check the event log to see if something was triggering it into rebooting itself. The only thing that I could see was that the log had stated that the machine had powered up but

Perception is Reality

By Kevin Noble

never stated that there was a power loss or that the game had been powered down. The only thing that was present during the two reboots was the error log “presentation set-up change – volume.” We closed the door and started to press the outside volume control icon on the screen to see if maybe the monitor was causing this problem. We played with the touch screen icon trying to recreate this problem but nothing happened. We went back in the log and noticed that the “presentation set-up change – volume” was logged properly for the couple of hundred times we pressed the icon. We did notice that the machine had no volume. We decided to check the connection between the audio plug and the CPU. It was missing. We found the audio cable that plugs into the CPU, plugged it in, and the game never rebooted itself after that. Was the audio cable grounding itself out somewhere in the cabinet causing the game to reboot? I did not see where the end was touching when it was retrieved.

Bally Alpha “Reel Gems” Theme Cannot Set the Progressive – “Invalid Progressive Level”

A few weeks ago, we started close to half the floor with the new Bally 326-00 Operating System upgrade. The first couple of “reel” projects started on a Tuesday (which happens to be my first day back) for about two or three weeks then shifted to Mondays with the video game upgrades. When I came back on Tuesdays, the games were usually all ready for AGCO inspection so I was not too involved in the beginning of the project and the setting of the options until this project started back on this one Tuesday and my brain was still thinking “reels”. Following the procedure



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outlined above, we ran into a small problem with one theme (Reel Gems) on our Cinevision Operating System upgrade. Everything was running smoothly with the upgrade and option setting until we tried to set a progressive amount. Usually, we would take the top award that was in credits, convert it to a dollar amount and make that the non-incrementing progressive value. Once the "GAME" options were set, we plugged in the value we thought was the top award into the base value (this was from our slot file) saved all the values, closed the door and the "Invalid Progressive level" error message was displayed. After pulling out the par sheet from the game and brainstorming about five minutes (coming up with a least a half dozen top award values) we proceeded to re-clear the game again, reset the options and plug in the new value. The same message appeared again. We went through the procedure of RAM clearing and inputting a different figure in the progressive base value on five different occasions. We called the Operations Manager to relay our findings and were told once we figure it out to report the findings to him so he can make the necessary changes to his slot file. The Shift Manager was now involved hunting down any other sites to see if this theme was already in service and what was the value

they were using. To much to our surprise, we were the only site with this theme with this problem. We contacted Bally support and explained our situation. I talked to Steve about our problem and discovered that we had "G" level software that was not progressive capable. I explained to him that in most cases, you generally hit a wall when trying to set the progressive values but this theme allowed us to proceed through the entire process. The first thing Steve asked us to do was to set the progressive value to a figure we have not tried. When we did, the problem reared its ugly head again. I called him back and explained that the problem still existed. I forward off a copy of the product development technical advisory to Steve. The next day Steve responded in an e-mail that the theme in question was a video game and it did not include this type of platform but reels. I immediately slapped my forehead like I could have had a V8 and realized he was right and I was wrong. But I did bring up a valuable point that this one theme allowed us to go all the way (which it should not have) and the product development team issued another updated technical advisory to allow us three possible scenarios for video game set up a couple of days later. After looking back at all the 100 or so Bally video game upgrades with the progres-

sive capabilities that were already set, we breathed a little sigh of relief that we were setting the video correctly after reading the new technical advisory. I would really like to thank Steve Brunn at Bally Gaming for all his work in helping us solve this over at our site.

Bally Alpha Six Inch Monitor Blank

I was called to this game after a Slot Attendant powered this game down and the monitor would not come back up. To verify the condition for myself and to see what was happening, I powered the game down and watched for any clues as to what was happening. I noticed that the LED lights over the top of the reels would not come on and the little six inch monitor would stay blank. I knew the monitor had life in it because the screen would display "No VGA Signal." Just to eliminate the monitor, I unplugged it but the lights still would not come on. I completely unplugged everything that the monitor plugged into and the problem was still evident. I started to swap out the 5 volt and 24 volt power supply and nope, not the problem. I next removed the CPU from the game and the lights came back up, I replaced the CPU back in the game and removed the power cord and powered up. The lights stayed on. I plugged in the cord and the lights went off. I thought



Bob Yabroff
President

“I have always supported Slot Tech Magazine”

“But to tell you the truth, the content of this magazine is gobbledygook to a seating guy like me.”



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that the CPU power supply was the problem. I decided to change the power supply out, powered up, and the light was off. We had AGCO come in and break all the seals and changed the entire CPU unit and the problem went away.

Garfield Mikohn Gaming Sigma Video CD-EPROM Mismatch

Sometimes when doing a service report, we find that the Mikohn and Soft meters are not aligned. Often, you can power down the game and power back up and the meters will match but not this game. It went into a CD ROM-EPROM Mismatch. After the game was powered off after it went through its boot up sequence. It took two hours to reach its goal of 100% so we knew something was up. We started chipping away with little things like cleaning the CD and swapping out the CD drive but the problem still existed. We ordered a new CD figuring that the CD went bad. That did cut down the boot up sequence to about ten minutes or so. We had the seals broken on the game so we could swap out the CPU board. Nope, same problem. We had AGCO verify the EPROMS and they were fine. We swapped out a new Disc-On-Chip and a motherboard but the same problem existed.

Getting nowhere and running out of ideas, I posted

on a couple of technical sites to help steer me in the right direction. Nick Surla asked me to try replacing the top bonus board. No harm in that as we ran out of ideas to get this game up and running. We ordered the board, replaced it, and watched the CD verify itself in anticipation 98%, 99%, 100%, then CD-EPROM miss-match error "Please call Attendant." The next day we received another message from Nick saying how funny it was that we mentioned these issues as they too have a game doing the same thing. He said the boys had ordered a new game chip but he was not sure if this would work. I stayed waiting patiently for any results from Nick. Then Nick finally responded with these conclusions:

After several more attempts, they were able to get this game working again and in OOS mode waiting for seals. These are the things that they did find:

1. CD was dirty, had some spots on it. They cleaned it.
2. Replaced the Disk-On-Chip. Were not sure if this was the issue.
3. Straightened a bent pin on the boot and game chip.
4. RAM-Cleared again and had to wait.....for boot up.

I think that there were several issues here that played a role in game failure. Please check the above and he wished us the best

of luck.

Well Nick, I am sorry to say that we cannot make any headway with this game and without any tech support or parts available, we were happily informed that this game plus the three others on the floor (that are currently running) just bought a one way ticket to the dump. I wish this was another happy ending on our end but I am glad Nick was able to solve it on his end. I wished him the best with his Sigma video. I wonder if he needs three more?

IGT I-Game CRC Error

We came in for our shift in the morning and were told that a game was down because of a CRC error. We needed AGCO to come in and break the seal so we can start by RAM clearing the game to see if that would help. Once they removed the seal off the EPROM we noticed that the EPROM looked like one of the pins was folded over. We removed the EPROM from its socket and noticed that it was not folded over but missing. The broken pin had to be just long enough to make contact and over time started to unseat itself. A new EPROM was ordered. When the new Base EPROM arrived, all we had to do was pop it back in the socket and verify that the options have not changed.

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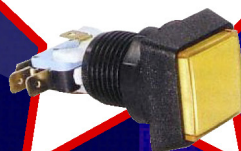
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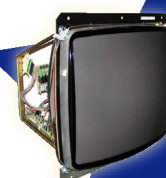
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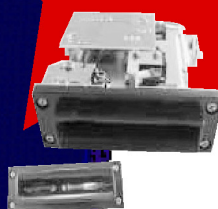
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IGT SAVP Tower Lights Staying On

Just out of the blue one day, the top tower lights on two games were staying on. We called around and others suggested that we change the power supply. We did but the problem still existed. The two games were in Board Monitor Tilts but never did lock out the game so you could continue to play. The reason we found out was because there was a low voltage on the battery. We called IGT Canada and they suggested on how to repair this problem so I wanted to pass this along. To fix the problem if it happens again, you have

to reboot the battery. This is done by unplugging the battery when the power is still on. After the battery is unplugged you power off the game and wait for about 20 seconds. Then you power the game back on. When it is powering up, you need to plug the battery back in. After it has powered back up you will need to clear some tilts and then reboot the game again. This should take care of the problem but if it happens again, replace the battery. Thanks to Andrew Randall, Senior Slot Technician here in Windsor for passing this information on to me to share with you.

Atronic e-motion System Error Log Corrupt

We tried to clear this error by rebooting the game and turning the reset key but the error would not go away. We next tried calling Atronic for any helpful advice. They concluded that a RAM clear might be needed to fix the problem but I had one, last-ditch effort before calling AGCO to come down to break seals. I was going to reboot the game but I was going to hold the red reset switch while I powered on. The error went away and the game was back in service.

- Kevin Noble
knoble@slot-techs.com

Slot Tech New Product Hardware Random Numbers From a PCI Express Card

ID Quantique SA announces the launch of a PCI Express version of its Quantis random number generator. The new card is a low profile device, so that it fits in all platforms. In parallel to this new product, ID Quantique is also introducing a new version of the software package accompanying Quantis, which includes 64-bit drivers. These new developments will strengthen the position of Quantis as the reference true random number generator for applications in cryptography or gaming.

Quantis is a true random number generator which exploits a quantum process – the reflection or transmission of a photon on a semi-transparent mirror – to produce random bits at a bit rate of up to 16 Mbps. The quality of its randomness has been certified in 2008 by the Swiss Federal

Office of Metrology. Since its commercial launch in 2004, Quantis has become the reference hardware random number generator for demanding applications, for example in the field of web services, cryptography or online gaming and lotteries.

In addition to the launch of this new product, IDQ is also introducing a new software package for the Quantis family. This package includes drivers for newer 64-bit operating systems, a new library with advanced features as well as wrappers to simplify integration with advanced programming languages. “We keep receiving excellent feedback from customers and we are confident of the great poten-

tial of Quantis on the market. This is why we have invested to guarantee that this product remains compatible with new platforms, both from a hardware and software point of view” notes Grégoire Ribordy, CEO of IDQ.



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IGT AVP 2.5 Bad COM Port

While helping install some games (IGT AVP 2.5 uprights) with programs such as “Abra Cash Cadabra” and “Sushi Cash” there was a communication issue. On the first game that was tested in the bank there was a problem; an SAS host error wouldn’t clear. I double checked the Oasis “global settings” and were ok. The Sentinel was looked at and come to find out, the “interface” cable was missing. (The cable that connects the game to the Sentinel.) Another game was checked and yes, the cables accidentally weren’t installed. Even with the cable installed and “global settings” double checked, one game still had a communication problem. On the game COM boards, none of the lights were lit up. When the interface cable is connected and the game is turned on, along with power to the

Quick & Simple Repairs #64

By Pat Porath

Sentinel, there should at least be a light or two lit up. Under normal working conditions the game COM board has three LEDs that light up, one red and two green that flash. I checked the game options to see if maybe one was missed, such as the “address 1 SAS secured enhanced” and such.

I didn’t know what the deal was. A co-worker looked at it and we swapped the COM board with the game next door. The problem did not follow which meant it was on the game side, not the board itself. There are open “channels” or “ports” that can be used but the software has to match which port the COM board is in. “Port 1” or “Channel 1” is at the top and “Port 4” is at the bottom. After the board was inserted in Port 2 instead of Port 1 and the software was set the same, the board lit up like a Christmas tree. For some odd reason, the game had a bad COM port on the motherboard. With it lit up and communication established, the game could be tested. COM was checked two ways: Firstly, the game didn’t have a “SAS” error on the screen. Secondly, it was checked by opening and

closing the door with a floor or mechanic card inserted to show OPEN or CLOSED on the Oasis display, which the game did. So, it ended up that the game had a bad COM port and the cause



was discovered by simple “swaptronics.”

IGT Upright Video Slot Power Problem

While walking up to the video slot machine, it looked like the power was turned off. Come to find out that the game had a power problem. The slot attendant stated after the bill acceptor was looked at and the main slot door was closed, power went out. The interior light of the machine was lit up so I know that I had some power to the game. The power switch to the game was turned off then back on but only the monitor flashed for a second, that was it. Next, I checked to make sure all of the I/O boards and the main processor board were snug in place, and they were. On this specific model, a power supply is located directly behind where the hopper would normally be. Being the game is coinless, it doesn't have a hopper and the power supply is in plain view. At a quick glance, it looked to be in place, but when I checked to make sure, it in fact was a bit loose. Now that the power supply was snug in place, power was turned back on to the game. All of the lights lit up and text appeared on the monitor. Simply a loose power supply was the problem. Once again, another game back online.

JCM Series 200 Printer Problem

First of all, a lot of the times only dust and dirt are the problem. When the JCM series 200 ticket printer is open, you should see one optic located at the top right hand side. (This optic is pretty obvious.) When the unit is looked at closer, you will see another optic located to the back of the print area. After the printer is blown out with compressed air, both of the optics need to be wiped off with a dry Q-tip (at least that is what I do with them). Most of the time, this does the trick. This applies to other brands and models of printers as well. Simply blow them out with air and wipe off the optics. Sometimes the printer needs to be torn apart and an inter-

nal optic needs to be cleaned, such as with the GEN 1, GEN 2, and GEN 2 Universal printers from FutureLogic. Once clean, they typically work fine.

WMS Bluebird - “Cherry Bomb” Wouldn't Boot

We had a WMS “Cherry Bomb” game that wouldn't boot up all the way, in fact, it wouldn't even boot past the “text” area. The OS (operating system) card was swapped with the identical game next door and the game was energized. Once again, the game wouldn't boot up. Next, the game card was swapped. This time, the game booted up normally.

The problem was found, simply a bad game card. When a replacement was



JCM Series 200 Printer

received, both the OS card and the game card came in, I was hoping that the procedure would be “plug and play.” As I found out, it sure wasn’t. With both cards replaced power was turned on. It appeared to be loading properly, then “call attendant” appeared (definitely not a good sign). The original OS card was a different version than the new one so I thought I would try putting it back in and see what happened. No such luck there either. Now with both new cards back in the game it was turned on once again and “call attendant” appeared again. This time I turned the jackpot reset key and it displayed on the screen something like “software changed, NV RAM needs cleared.” The RAM was cleared, the OS card was put back in and yet again, another power cycle. Finally, the game was loading like it was supposed to. Now, all of the game options needed to be set up, such as “no coin comparator,” “hopper disabled,” “printer enabled,” “SAS primary,” “address 1,” “asset number,” and others. I compared the options with the game next door to make sure they were correct. It was time to test “Promo Cash” and to make sure it would accept and print a ticket. The first three times I tried to download “Promo Cash” an error occurred. What option did I miss? Was there another problem that I wasn’t aware of?

Game options were re-checked, and I found that AFT was disabled. With it disabled, there was no way the game would take Promo Cash.” Another attempt was made and this time it worked. The game finally accepted Promo Cash and it printed and accepted a ticket. All that was left was for the paperwork to be verified and it was back online

IGT AVP Bartop Game-Black LCD Monitor

A call was received that a bar top game had a black LCD so I went there and checked it out. While looking at the back of the LCD, I noticed the power light for it was black too. It appeared it didn’t have any power at all. Was it a loose connection or did the LCD go bad? The location of the video cable was obvious and snug

in place but it took me a minute to find the power cable that goes to the LCD. At the angle from which I was looking, I couldn’t see it very well and it HAD to be there somewhere. While looking at a different angle I found it. I pushed on the power cable a little, and it was loose. Instantly the power light on the backside of the LCD came on which told me the unit should be on. Simply a loose power connection to the LCD was the problem and the game was fine. From the slot door being opened and closed numerous times, the cable had worked itself loose. I’ve also seen this a few times on upright AVP games. Make sure the power cable is snug in the LCD and it comes back on.

- Pat Porath
pporath@slot-techs.com

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Incredible Technologies Magic Touch BRZ-U1-Breeze Upright



By Herschel Peeler

I recently had the opportunity to see the Incredible Technologies Magic Touch games and Breeze cabinet up close that was in an earlier Slot Tech Magazine. The article was good but not of much value to a technician. Of course all games these days say their games are tech friendly. Well, I had to see for myself. For those of you that know me through the forums, you know that I do not have much of a reputation for being vendor friendly. So here's the scoop I get: Yes, very tech friendly. Easy to work on but for the same reason, such games may spell doom for us technicians.



Game Features

The game I saw was TITO only and had provisions for neither a coin acceptor nor Hopper. At the time of this writing the game was not completely approved for Nevada yet but in the test phase and it is expected to be approved soon. It is being tested at different locations with various accounting

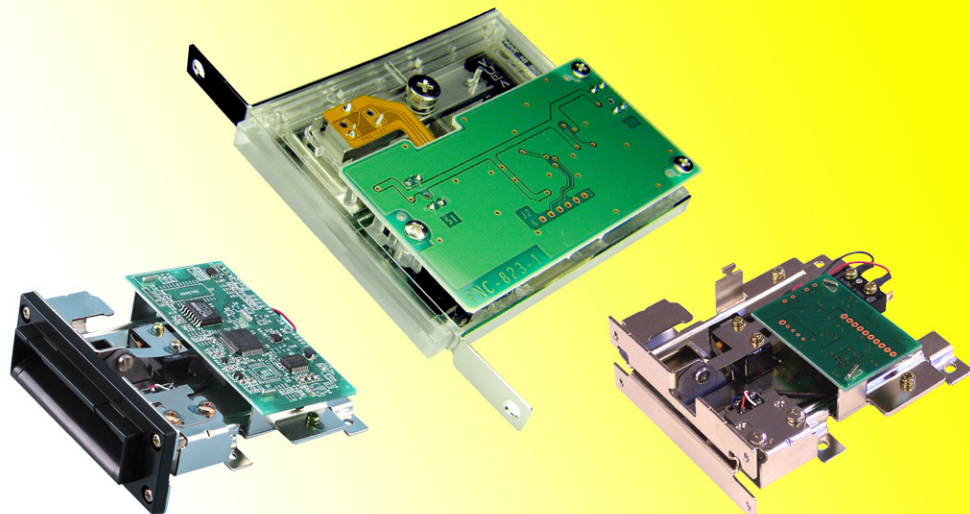
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systems. Most of the games were pretty standard. Keno had a neat feature that listed the most recently least and most popular number history for those who play those numbers. Personally, I don't think either of them helps you win but what do I know? I'm not a player. There is also a ProTip feature I will go into later.

Language Support

The software is written to make adaptation to a language other than English a pretty easy task. It is mostly just a matter of changing canned message routines.

Sound

The sound quality is quite acceptable. At the property's discretion, sound levels may

be set or left to the player to adjust within a predetermined range.

Cabinet

Perhaps some of the best features can be found here. It is comparatively light weight and is a one-sturdy-man machine move. One person of typical strength can move it from floor to stand. OSHA may not approve but it can be done.

Editor's Note: Breeze cabinet with Top Box weighs nearly 200lbs.

The bottom of the game is about 75% open space so mounting holes are easy to access. The game is small enough to shuffle around by one person. It is easy to get arms around and position it.

The LCD display (ELO brand) easily swings out of the way for access behind it and turns around so you can watch the display while working on the game. Super! Other monitor brands are being considered as I understand it.

Key switches are easy to access for changing. You don't have to tear out a bill validator or anything to get to them.

Lots of open space for air flow through the cabinet. The model I saw uses CCFLs for general lighting but the company is considering use of LEDs in future iterations. I don't see much of anything inside the cabinet to generate much heat once they get rid of the CCFLs. On this



Monitor swings out for service.

model, the Inverters for the CCFLs run off of 12 V. I assume the LED assemblies will also.

This looks like a super tech-friendly game. You can change the MPU / Motherboard with no tools literally in minutes. Remove connectors and twist a thumbscrew to remove the MPU. A super feature for troubleshooting weird problems by swapping MPUs between games.

The Bill Validator and Ticket printer are serial devices. The Player Panel is a USB device. Instead of having dozens of wires between the Player Panel and the MPU or I/O board, the player panel goes to a Door I/O board that connects to USB. This is good in the sense that the design is simplified but putting so many things on the same USB bus can be problematic to troubleshoot since any one device failing can cause all USB devices to fail. Troubleshooting down to a bad assembly isn't rocket science. Just disconnect devices until you find out which one is dragging it down.

Preference of Bill Validators and Ticket Printers is an option. They support most of the popular types.

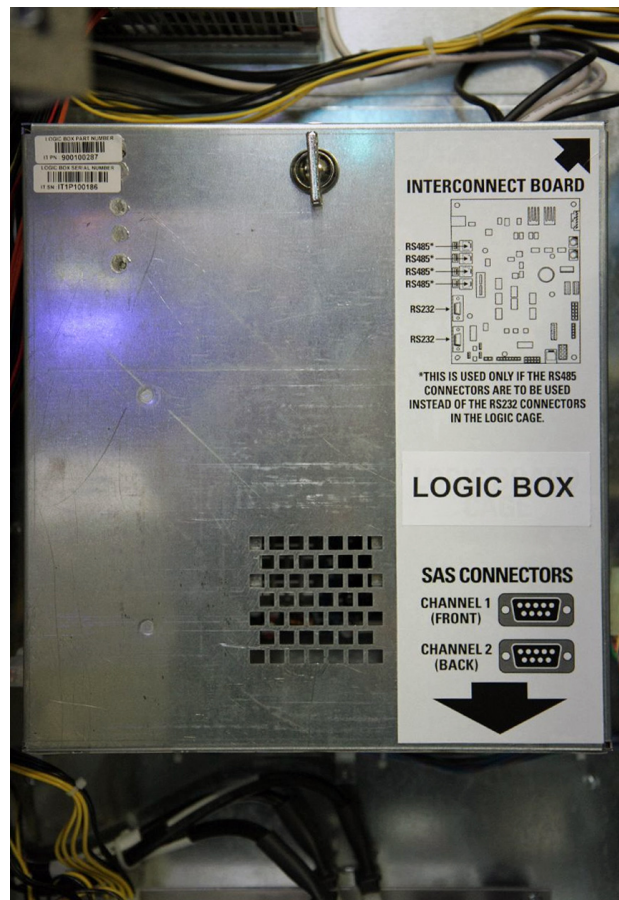
Other than the MPU/ Motherboard there are only two other boards: the Player Panel board and the I/O Board. Both looked like they were populated with off-the-shelf components. I saw no creative or tricky designs in the circuit. Troubleshooting and repair of both boards should be pretty easy if you

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grasp USB. I would be happy if they provided schematics for these two boards but the circuit looks pretty straightforward and simple even without one.

Top box glass and belly door glass are plastic so they won't break as easy as glass. The Top Box glass just lifts out but the belly door glass would take a little while to change.

Player Panel switches are the same line as IGT uses (Lorenzo is the manufacturer). Changing a player panel switch will be more than a



The MPU / Motherboard can be changed with no tools literally in minutes. Remove connectors and twist a thumbscrew to remove the



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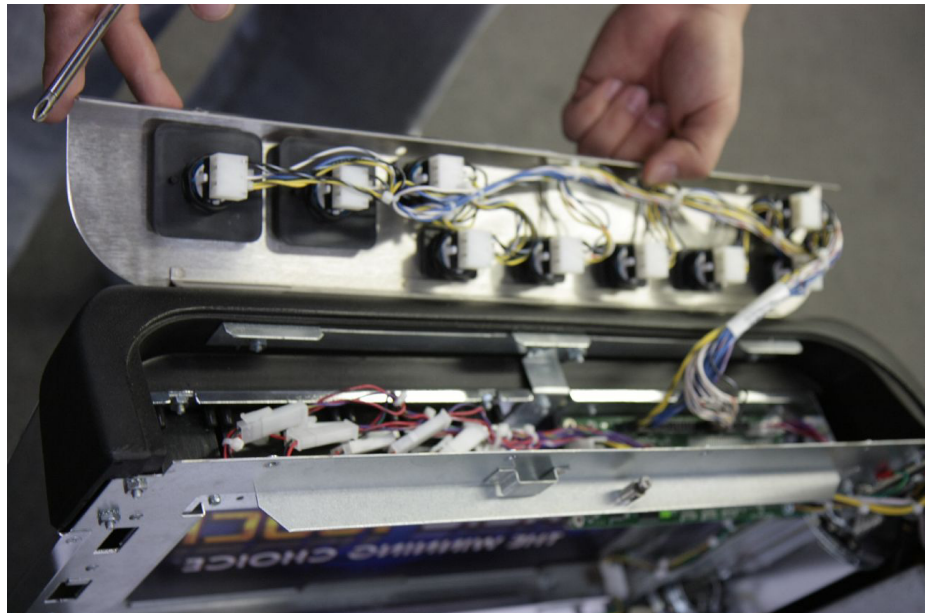
five-minute repair. Some disassembly is required. The Player Panel (Buttons) Board runs off of 12 V and USB. Instead of having dozens of wires running from the Player Panel to the MPU or I/O board there is a Button Board on the door close to the player panel. All player panel and most door functions go to this board (which is a USB device) and then to the MPU.

The tech manual doesn't have much "tech" stuff in it but isn't this the way the industry is going? A slot attendant can maintain the game with a screwdriver and a pair of pliers.

The tower candle is the only incandescent lamp in the game. Maybe by G2E that may be an LED also. Door switches are standard 3-position mechanical "Cherry Switches." This looks like it is a really low maintenance game.



ICB (Interconnection Board-I/O Board)



The Player Panel

Hard Meters

Hard meters are easily viewed through the belly glass area and are wired through the Player Panel USB board.

ICB (Interconnection Board-I/O Board)

This is a USB device connecting to the MPU. Connecting to it we have the Bill Validator, Ticket Printer, door circuits, tower lamps

and audio amplifiers. It runs on 24 V DC from the second power supply and 12 V DC from the ATX supply. A great feature here, most of the "likely-to-fail" circuits are on the I/O board outside the locked MPU cage. Changing it is a five-minute repair. Easy access. Simple tools.

The overall wiring diagram shows a cabinet fan running off of 12 V. The sound system also uses the 12 VDC power supply.



Two SAS ports

MPU and Electronics

Two MPU/Motherboards are shown in the tech manual. One is an MSI Motherboard, the other is an Advantech Motherboard. The Advantech can be identified from outside the cage as having a DVI video output (as well as the standard VGA connector) and two serial ports. The MSI just has the VGA and one serial port.

I think both MPUs have a dual core processor running at about 2 GHz with 2 GB of RAM. The MPU is a standard small footprint PC design.

NVRAM and NVRAM Clear switch are inside the lockable MPU cage.

There are four USB connectors for: button board (player panel), touch screen, ICB (Interconnect Board, I/O Board) and a spare. The Ticket Printer and Bill Validator are wired as serial devices through the control of the I/O Board.

There are two serial ports for SAS (Slot Accounting System) and two Ethernet connectors but as of this writing the Ethernet connectors are not used.

There are four USB Memory Boards conveniently mounted on the door for easy access. They are: Writable (NV Storage), Operating System (Linux), game programs and location configuration files.

Forensic Export

That spare USB space can be used for a USB stick to save the current state of the MPU

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in cases of those “real interesting failures” that you want IT to actually see. This is as simple as putting in the stick, turning on DIP Switch 5 and powering on. When the process is done, turn the game off, remove the stick and email the contents back to IT.

My take on this is that the contents of the forensic export file is tokenized and really can’t be interpreted by us who don’t have the inside info. Some parts of it are readable, but much of it is not. This seems like a great feature for those problems where the vendor says “we’ve never seen that before.” IT has given us a way to show such things to them. Another “Super!” is warranted here.

POST

The system runs a version of stripped down Linux. Most steps I noticed in Power-On Self Test were clearly de-

fined. If it fails, the screen gives a good description of what specific test failed in good readable English. It is especially useful to be familiar with embedded Linux or some other version of Unix.

POST takes a bit over four minutes but you have to consider the game I had in front of me had 27 games worth of software loading into it. It is the prerogative of the property to bring this down to a minimal number of games, speeding up POST I would imagine.

No CD or DVD. Being a PC at heart, most memory is Flash or USB card. Four cards are standard, easily accessed when you open the MPU door.

Diagnostics

Diagnostics were intuitive and clearly structured. Bill Validators and Ticket Printers can be pretty thoroughly



Diagnostic Menu

tested at the game. MPU Fan Speed and MPU Temperature are available on a menu but I didn't see voltage levels on any of the screens. That would have been nice. Of course all the usual tests are available.

Power Requirements

120 V AC, 7 Amps at initial start up and about 2.5 Amps during normal operation. The one I saw only had 120 V, 60 Hz operation but it may only be a change of power supplies to get to 230 V, 50 Hz. I couldn't see if the supplies that were in there would work at different voltages.

Convenience Outlets

Two un-switched, one switched. All have easy access with lots of visibility and hand room. Super!

Power Supplies

The 400-Watt PC-style (ATX) power supply is easy to access and replace but I would be happier if they had provided an easy place to check voltages. From what I could see, there was no "creative engineering" in the power supply. If you've worked on the power supply for a PC, you will be at home with this one.

Other than the PC-type power supply, there is a 24 VDC supply that powers the I/O board. Again, an off-the-shelf assembly. For the troubleshooting tech, the question is always "what power supplies cover what operations?"

24 V – Ticket Printer
12 V – Bill Validator, Gen-

eral Lighting (CCFL or LED), Button (Player's Panel), LCD Display, Cabinet Fan. There is also a run that goes up to the Top Box for General lighting and whatever else y'all might put up there. I assume the Tower (candle) is also 12 Volts but the schematic doesn't specify so. 12 Volts also goes to the MPU. 5 V – Meters, Bill validator interface and MPU. 3.3 V – MPU only.

The schematic does not indicate what powers the sound system. The audio originates on the MPU board of course and power audio amplifiers are on the I/O Board.

Operation and Game Play

The model I saw had 27 basic games. Each game has individually set options. Any game, any denomination, can be set to any allowed hold percentage. Each game (where it applies) can be set to adjustable volatility at three levels. More on this later. Incredible Technologies has put this option (volatility) in the hands of the player. I like it! Game speed can also be player selectable at the discretion of the house.

Game history and event history is... well, big! The game I had in front of me didn't have much history to go back on.

Any of the 27 games can be set to any denomination of



and any allowed Hold Percentage (within the range of your jurisdiction).

AFT is an option, depending on jurisdiction.

The playfield display is very flexible. Poker games can be set for many optional appearances. "Suggest Hold Cards" is an option the house can allow. When enabled, it gives the player potential percentages of probability of wins. This is a "ProTip" option.

ProTips

A neat feature that can be enabled at the house's prerogative is ProTip. Players accumulate ProTip points. After six wins, the "Pro" letters turn gold, the "Tip" letters turn green and the game begins to suggest the best possible win, such as poker hands. The screen suggests the best play and lists possible percentage probabilities for those wins. The player has the option of taking the tip, which uses one "tip point." Many tip points can be earned and transferred to different games but once the session is over (cash out hit) the ProTips are lost.

Future Features

Items being considered by

the company that are currently not available include a tournament play, progressives and WAP support.

Player Selectable Volatility

This is one of the best features, I think. Each game (able and activated) can be played in one of three volatilities. It can be High Volatility (large jackpot that comes up less often), Normal volatility, or Low Volatility (smaller jackpots that come up more often).

Player Tracking

A panel right above the player panel is available for the player tracking system. A shelf (the top of the speaker box) is available right behind that to mount the player tracking controller or SMIB. An unswitched AC power convenience outlet is easily accessed from that point. The game is currently being tested with different tracking systems and I'm told all is going well.

Problems

It's hard to find things to complain about but I'll force myself to find something here. The Player's Panel could have easier access. It requires removing a panel with four screws to get to the bottom of the switch panel in order to repair a switch. They use the same "reliable" Lorenzo switches IGT Game King stuff uses.

The door is pretty thick. Be sure to allow enough room between games so the door can open all the way without

hitting the game to the left.

Key Switches are in a bad place if there is a post supporting signage on the right of the game. This is a problem with any game it seems.

I would like to see a voltage monitor circuit board in this machine. It would provide a place to easily and safely check all power supply voltages. Preferably not just an LED "idiot light" that says any power at all is present. I would rather see a window comparator that confirmed each voltage was between two set levels, say a 5%

window each way. Each supply voltage would have an "Over", "Under" and "Good" LED indicator.

In too many places, the power sources for the MPU are the same as those that have problems. CCFL Inverters and Fans that can put a lot of noise on the line being on the same power supply that feeds logic circuits. I would have them on a separate power and ground system than the logic.

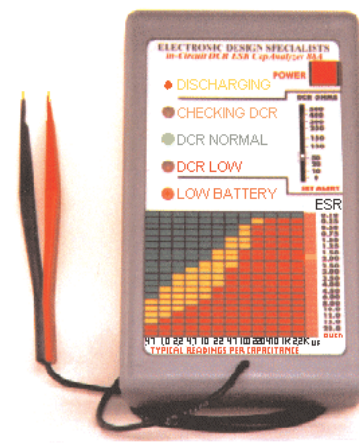
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Slot Tech Training at Riverwind Casino

As a technical instructor, I live for classes like this one. In this case, my host was a large operator that was throwing money at service problems because they lacked a service staff with bench tech experience. Like many operators, they were providing top-notch service to the casinos through Swaptronics but at the expense of their bottom line. When they experienced power supply or monitor failure, they would simply purchase a new unit.

Regretfully, they were actually discarding the inoperative units until they signed-up for a five-day slot tech class and I asked them to hold on to the bad stuff so we could repair it during the hands-on lab on the last day of class. I was amazed at the quantity of stuff they were able to gather for the lab. We had boxes and boxes of bad IGT power supplies! Within the first 90 minutes, the class had repaired over a dozen power supplies (I bring a mess of spare parts with me when I teach the class). At the end of the day, we totaled the value of what we had repaired (remember, they had been throwing the stuff in the trash) and it almost exactly offset the cost of the class! In other words, the training cost them virtually nothing right from the start and, of

course, now that everyone is on board with repair, they can look forward to saving this money ad infinitum. THAT'S what I'm talkin' 'bout and that's the coolest thing about being a repair tech. It costs only a few dollars in parts (capacitors mostly, of course) to fix these units.

I want to extend my thanks to Keith McKinney of Suzo-Happ who stopped by to give us a day of training on FutureLogic ticket printers as well as the MEI SC66 CashFlow bill validator. I also want to thank Harry Iverson of Pacific Illumination for providing the class with replacement CCFLs as well as the CCFL testers that I use during the class. Contact Harry at

pacificillumination@gmail.com if you have ANY questions about CCFLs or to obtain a CCFL tester. Thanks as well to my friends at monitor manufacturers Well-Gardner and Ceronix for providing other training supplies - **STM**





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About Randy Fromm: I am the publisher of Slot Tech Magazine. First published in 2001, Slot Tech Magazine is a monthly trade journal focusing on casino slot machine repair. I have been repairing electronics for the gaming industry since 1972. I really enjoy what I do and I love showing others how easy it can be. ***No previous knowledge of electronics is required.***

For more information, including course offerings and complete pricing information, please visit the website at slot-techs.com

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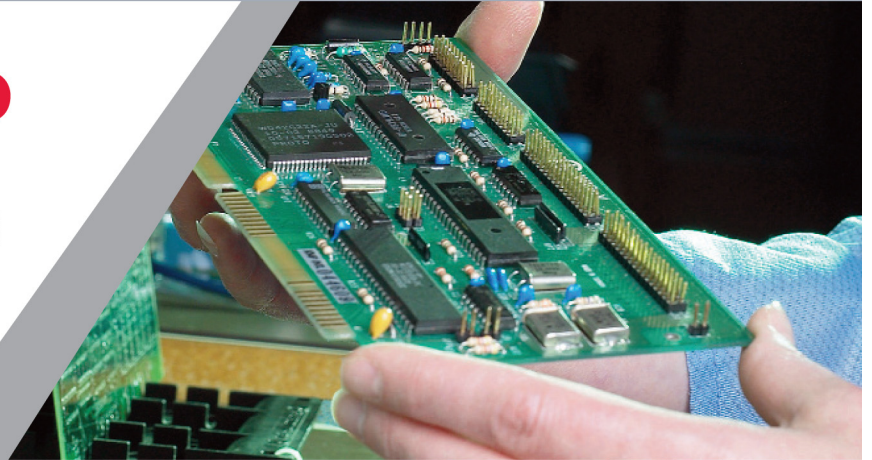
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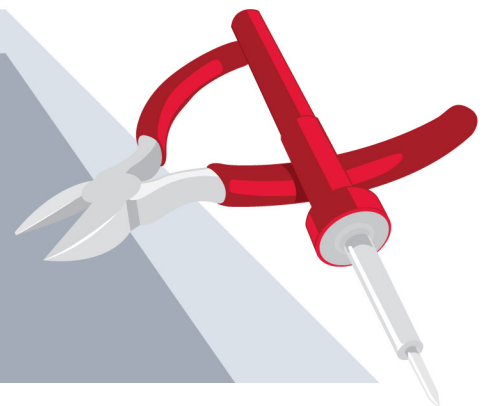
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