

December 2009

# SLOT TECH MAGAZINE

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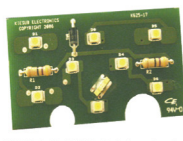
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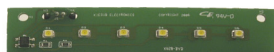
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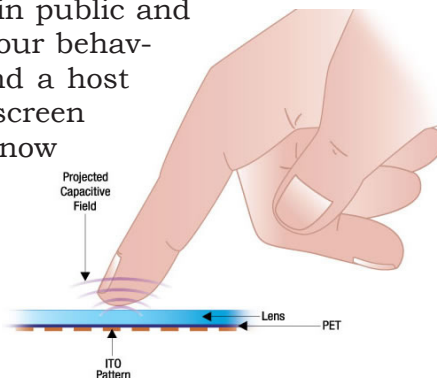
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**Page 25-JCM Bows iVIZION at G2E**



**Randy Fromm**

Now you can pinch and flick in public and nobody will think badly of your behavior. In fact, pinching, flicking and a host of previously impossible touch screen behaviors are all possible right now with 3M Touch System's evolutionary new projected capacitance touch screen with fully functional, unrestricted, ten-finger touch. They showed it at G2E and while it is not enough for a feature article-It's ten-finger touch. What more can you really say about it?-it is well worth mentioning as a nice, new technology.



Of course, there are plenty of non-gaming applications that immediately come to mind once you lift the single-touch restriction. Full QWERTY keyboards now work with fingers resting on virtual keys. Piano keyboards do too. The types of virtual joysticks and other controllers that are now possible are "virtually" limitless in the true sense of the word. We shall see what the gaming industry's design engineers come up with using this new device as a human interface.

Scott Reynolds is back! Some of you may remember Scott from the early days of Slot Tech Magazine. Well, for the past half-dozen years, Scott has worked for a manufacturer whose employment practices prohibited him from moonlighting in the gaming industry (a sensible rule, I suppose). That extended to writing for Slot Tech Magazine. Unfortunately for Scott, he was laid off but we win because he has contributed a nice article on IGT machines. Thanks, Scott. Welcome back. BTW, he's still lookin' for work so if you have anything, e-mail [sreynolds@slot-techs.com](mailto:sreynolds@slot-techs.com).

*Randy Fromm*  
Randy Fromm - Publisher

#### Randy Fromm's Slot Tech Magazine

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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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I'd like to share with you some information I have on the IGT G Series games, including the G20 upright, G20 Bar Top, G22 Slant Top, G23 Upright, S-AVP and the SMLD, in the hope that it may help.

Let us first discuss the various Ekeys and diagnostics. There are three Ekeys used on all AVP games:

Ekey 3 – Installation

Ekey 4 – Diagnostic, used among other things to clear safe RAM and cabinet memory (cabinet memory is equivalent to E2)

Ekey 5 – optioning

In order to figure out which diagnostic key to use when troubleshooting or loading software, you must know the “family” of the software installed on the machine. You can find this information in the PSR (Program Summary Report) for the software you are installing/troubleshooting.

## Tips for the IGT “G” Series Machines

By Scott Reynolds

The G20 & G22 are video slots while the S-AVP is a three, four or five physical reel slot and an SMLD is a Multi-Level Display in an S-AVP cabinet made to look like standard three, four or five reel slots. If you have trouble navigating the narrow touchscreen on the S-AVP, you can use a capacitive stylus designed for the iPhone/iPod Touch. These can be found at amazon.com or many other places on the internet. Just search for iPhone stylus.

The G23 is primarily used in participation games such as Star Wars, Wheel of Fortune and Indiana Jones Multi-Level Progressives so most casinos shouldn't have to worry too much about them. In the case that you have “device offline errors” as described later in this article, you can use the procedure as described with one exception: If the LED bar lights go out, power down the machine, unplug the USB cable for the light board (the light board will be located in the upper left of the main cabinet), Plug the USB cable into a new USB port and power up. The cable for the lights must be plugged in before the machine fully boots or the LED light bars will not come on.

The games you have will either be AVP 2.5 or 3.0. The 2.5 is the most common right now and has a separate video card. When you need to load software, you must use a write protect jumper on the pins located on the lower left corner of the brain box. The 3.0 on the other hand has integrated video and a write protect switch in the lower left corner of the brain box.

Be aware that all of the 2.5 games suffer from heat issues primarily caused by faulty video card fans. If you have





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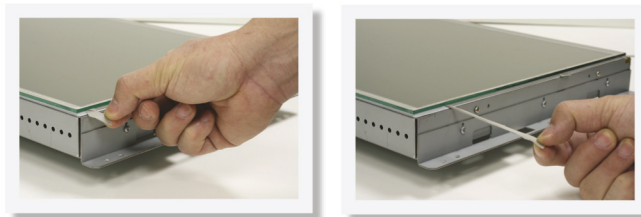
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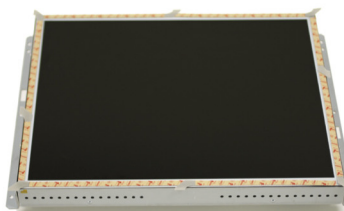
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any type of video issue and/or rebooting, check that the fan on the video card has not seized or is about to seize.

All of the G series games suffer from many types of RSOD (Red Screen of Death) memory errors, so named because when one occurs, the screen goes red with an error message. A good deal of these can be taken care of by clearing safe storage memory. If however, you encounter a "Presentation Manager" error, the 1GB DRAM stick will need to be replaced. To clear safe storage memory:

1. Power down the machine
2. Insert proper diagnostic flash drive in any available USB port
3. Insert Ekey 4 in protected USB port, this is usually behind a locked door on the brain box
4. Power up the machine
5. After a little while you should see a light blue screen come up with many different buttons on it
6. Select "Clear Safe RAM"
7. Follow instructions
8. When finished, remove diagnostic flash drive and Ekey 4
9. Cycle power

You will need to enable games and set percentages following this procedure; all other options should be fine but verify them just to be sure.

Other problems you may you may run into with all of these games are peripherals that error with "Device Offline" messages. The first thing you should try is this: unplug the USB cable of the offending peripheral, power down, power up and then plug peripheral into different USB port. Due to an issue with software, the USB ports tend to go to sleep after a time and this is the approved way of waking them back up.

If you encounter a game that is stealing bills, be sure that the bill validator has either the netplex connector or USB connector plugged in depending on your setup but not both; if both are plugged in

this will cause a conflict which in turn will cause the stealing of bills.

If you get a "License Dongle Failure" following option changes, power outage/ brownout or player tracking problems, check to make sure that the time and date are set correctly. The license dongles are encoded with a date when they are loaded at IGT. When the real time clock on the machine defaults for any reason, it returns to 1986 or some other date in the past, this date is before the encoded date on the license dongle and therefore the software sees it as a failure.





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The G22 slant top frequently has issues with main door open errors. Get out your Allen wrench and loosen both screws on the door latch, pull this latch assembly up with your fingers and tighten down the screws at the same time. The main door must be closed forcefully but not slammed; lower the door gently to the latch then put both hands over the center of the door and push down hard. The latch pin on the door itself is cast metal, so there is no bending it. A lot of things are cast metal on these machines so that individual parts cannot be replaced anymore.

The G20 upright latch pin (the pin you lift to release the latch so the door will open) frequently breaks off. This is typically due to the pin just being pressed into the plate. If one of these latches needs to be replaced, you will most likely need security involved as the bill validator and cashbox assembly must be removed to access it. The IGT Part number for new welded latch pin plate is 59682000.

On the S-AVP, there are several items to watch out for. When the S-AVP originally shipped, it was equipped with a ticket holder expander that screwed onto the top of the printer. As you know, most floor people are hard on equipment and they will typically slam the printer home when closing it on these games. There are two things that frequently happen when they do this: First, the spring that controls the latch which holds the printer up comes off and the printer will no longer stay upright. Second, the ticket holder expander is forced into the USB cables which are directly behind unit. This can break the wires in the USB cable or more likely, damage the USB port which is located on the distribution board attached to the back wall of the game. The distribution board generally has to be replaced at this point and that is a long and painful process as the brain box assembly, AC Power assembly and printer assembly must all be removed to access it. Do yourself a favor and remove the ticket expander. No one I have

ever talked to actually uses it. As for the spring, you can either make your own or order a replacement. The IGT part number for the spring is 33011890W.

On the S-AVP, if you are getting various reel tilts that will not clear, take a look at the USB cable that runs from the reel driver board behind the reels down to the distribution board. The USB connector originally used on these was a standard straight connector. The problem is that it butts against a sound amplifier board which eventually creates a short in the cable and causes the tilts. You should replace this with a 90 degree connector or for the short term, you might be able to remedy it like this: Remove one of the nuts that hold the sound amplifier board in place and swivel the board up at an angle. Then, tighten the remaining nut to hold it in place so that it no longer interferes with the USB cable.

If you encounter a 3.3v out of range on an AVP 2.5, you can remove and reseal the cable from the ATX power supply to the brain box. Remember to turn the power off first. The ATX power supply is in a cage attached to the top of the brain box and has two cables that run from it to the distribution board in the back. AVP 2.5 and 3.0 ATX power supplies and cables are not interchangeable.

When trying to load software on an AVP 3.0, if you get a message that the machine cannot see the hard drive, clear the CMOS in the brain box. On the back of the main board in the brain box you will see a jumper marked CMOS. Remove and then replace this jumper to clear. Software should now load normally.

That's it for this time. If you have any comments or questions, please don't hesitate to write.

**- Scott Reynolds**  
**sreynolds@slot-techs.com**



# Subject: TechFest 20

## Date of Event: May 4-6, 2010

## Location: Mystic Lake Casino Hotel

### Schedule of Events

Events subject to change

#### Tuesday, May 4, 2010

9:00 am - 12:00pm

**Power Supply Repair** - Presented by Randy Fromm - Let's face it, we have a lot of power supply failures in slot machines. Some power supplies are more-or-less disposable due to their cheap replacement cost but many of the supplies we find in slot machines are custom-built units costing hundreds of dollars. For example, the ability to repair Aristocrat and IGT power supplies (actually manufactured by Setec and Win-Tact respectively) in-house will save your casino hundreds or even thousands of dollars in a year. We will cover the operation and repair of power supplies in detail during this session.

**1:15pm - 3:15pm MEI - BV troubleshooting and repair** - Suzo-Happ's Director of Training and Service David Oldham will discuss BV operation and service. Troubleshooting guides and handouts will be presented to help speed through troubleshooting in the shop.

**3:30pm - 5:30pm FutureLogic Ticket Printers** - Suzo-Happ's Director of Training and Service David Oldham will discuss FutureLogic printer operation and service.

#### Wednesday, May 5, 2010

**9:00 am - 12:00pm CRT & LCD Monitor Repair** - Presented by Randy Fromm - Video slot monitors are a lot easier to fix once you know how they work. Some understanding of electronic components will be helpful as this session will be somewhat more advanced than at previous TechFests.

**1:15pm - 3:15pm 3M Touchsystems Touch Screens** - Touchscreen Technology Presented by Paul Hatin and Mark Roberts - 3M Touch Systems Field Application Engineers - It is really amazing how touchscreens actually operate. During this session, touchscreen theory of operation will be presented along with diagnostic and repair techniques.

**3:30pm - 5:30pm Incredible Technologies Slot Machines** - Incredible Technologies has been credited by many operators as one of the most important and innovative manufacturers of video games in the world. Their "Golden Tee Golf" game revolutionized the online game tournament. Now, IT brings their team of manufacturing and design experts to the casino industry and to TechFest 20 with a close look at their IT slot machine. You will not want to miss this presentation.

#### Thursday, May 6, 2010

**9:00 am - 12:00pm Ceronix CRT and LCD Monitor Repair** - Presented by Troy Nofziger - Ceronix Armed with a general knowledge of how monitors work (and how to fix them when they don't) it's time to look at Ceronix. The Ceronix design is unique in the entire world and requires a bit of specialized knowledge in order to be successful at repair. LCD Monitor repair will also be covered. Ceronix's most experienced bench tech, Troy Nofziger will instruct.

**1:15pm - 3:15pm Transact Technologies Ticket Printers** - Transact Technologies' Russ Wigé presents servicing and troubleshooting Transact brand, thermal ticket printers. These units are simple to understand and troubleshoot, once you know how they're put together.

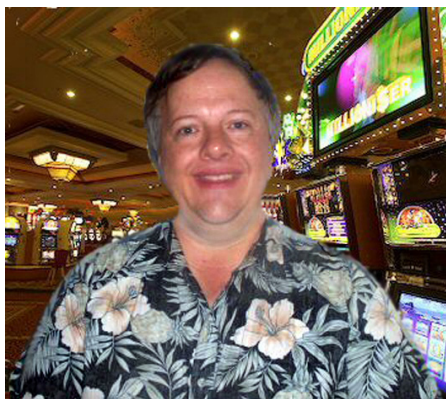
**3:30pm - 5:30pm JCM Bill Validators** - This is arguably the best seminar of its kind in the gaming industry so we've saved the best for last. This presentation will be given by JCM's Jack Geller. This is your chance to ask the world's #1 expert about your JCM "issues."

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# Touch Screen Troubles

By Vic Fortenbach

**I**t's Friday night and it's busy in the casino. You're walking the floor, just waiting for a call, when you notice a guest struggling to pick her numbers on an IGT bar top keno game. You notice that no matter which number she touches, a different number is selected. You figure it's a simple touch screen calibration problem. You perform the calibration procedure and test it by drawing straight lines on the screen with your finger in a criss-cross pattern but in certain areas, the straight lines you drew are displayed all wavy and curvy. Maybe it's getting late and you're tired but you know you drew straight lines. So you try again. Your finger moves straight and the lines start out straight but then go wavy and straighten back up. No, you're not tired, the touch screen has scratches. Where there is a wavy line, a scratch is nearby. The more the wavy the line is, the longer the scratch is. Most of the time the casino guest does not know that

they have just scratched the touch screen. Jewelry is the main cause. All a guest has to do is to graze the screen with any diamond jewelry while reaching for change or a drink and the touch screen is damaged. There is no way to repair a scratch in the touch screen, so replacement is in order. Touch screens or touch sensors as some manufacturers are calling them, are now made by several different companies, including Microtouch, made by 3m Touch Systems ([www.3mtouchsystems.com](http://www.3mtouchsystems.com)), Touch international ([www.touchinternational.com](http://www.touchinternational.com)), Optera ([www.optera.com](http://www.optera.com)) and Digitech [www.digitechsys.co.kr](http://www.digitechsys.co.kr). Optera is the only company currently making curved touch screens for CRT monitors; Touch international and 3m Touch Systems stopped making curved touch screens a few years ago. Optera touch screens are available from American Gaming and Electronics, AG&E ([www.agegaming.com](http://www.agegaming.com)). There are several other manufacturers making touch screens and controllers but their use is very

limited in the gaming industry.

Figuring out a touch screen problem can be tricky. Is the problem related to the glass touch screen itself or the controller? One sign that the touch screen controller may be bad shows up in the touch screen calibration test. You draw your criss-cross lines as usual but the lines on the screen start to curve, not a jerky wavy line but a gentle slow curve. Most of the time, this occurs in the lower corners. It is impossible to draw a calibration test line into this curved area. One reason this has happened is some liquid from a drink spill has seeped into the area under the monitor bezel and has started to corrode the fine printed circuit traces (lines) along the edge of the touch screen. Once this has happened, touch screen replacement is imminent, since there is no approved way of repairing this touch screen. Sometimes this problem can be linked to the touch screen controller itself.





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One obvious symptom of a touch screen controller failure is freezing. The screen is just frozen; no touch screen input will make the game proceed. Sometimes the controller will lock up and not allow any touch screen input from the touch screen or the player buttons. Power resetting the game only cures this problem temporary. Replacing the touch screen controller is in order. Many years ago if you had a controller problem you could not just grab a controller from the shelf and install it. This is due to the serial communication configuration. But times have changed and now the controller configuration step is not necessary. You can pretty much just plug and play a new controller into a game. Just be sure to pay attention to the input and output cables/connectors of the controller.

The most common controller is a small pearl-colored case about 3 x 4 inches in size (see figure 1). Microtouch was one of the first companies to manufacture touch screens and touch screen controllers for the video and gaming industry. They have been doing that since the early 80s. The Microtouch Company and name have since been merged with 3M which now owns, manufactures and markets controllers and touch screens with the Microtouch name. Their

web site is  
[www.3mtouchsystems.com](http://www.3mtouchsystems.com).

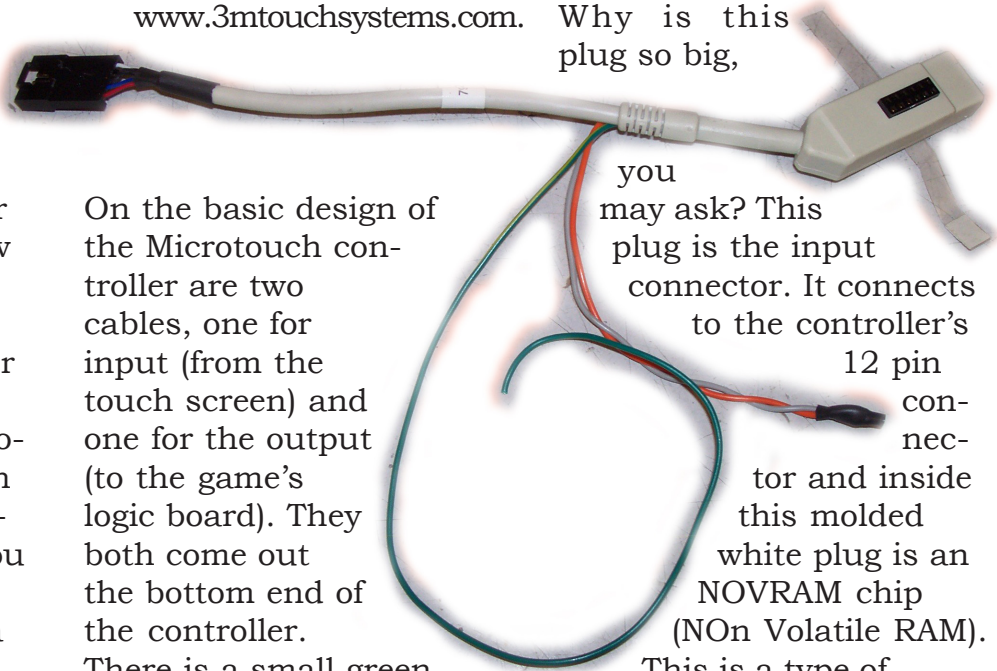
On the basic design of the Microtouch controller are two cables, one for input (from the touch screen) and one for the output (to the game's logic board). They both come out the bottom end of the controller. There is a small green LED on the opposite end. This green LED is not only a power indicator but also a diagnostic tool of sorts. You can use the LED to confirm the controller is receiving a touch from the touch screen. The LED change brightness level when the touch screen has been touched.

If you remove the case from its mounting (which is usually mounted on the back side of the LCD monitor or inside the monitor frame on a CRT) you will see the input cable has a large molded white style plug on the end (see figure 2). Both 3M and Touch International used this same style of plug

on their touch screens. Why is this plug so big,

you may ask? This plug is the input connector. It connects to the controller's 12 pin connector and inside this molded white plug is an NOVRAM chip (NO n Volatile RAM).

This is a type of memory chip that no power is required to retain its memory. Memory for what you may ask? The data for the linearization of the touch screen. The touch screen linearization data is stored in the molded white



**The Touch Controller**



plug, which should always remain attached to the sensor itself. All you have to do is mount it and connect it. You should calibrate and test a new touch screen and controller just to confirm its functionally.

The output cable is a serial communication from the controller to the game's logic board. The communication to and from the touch screen controller uses the RS232 serial standard. Normally the controller gets its power from the cable going to the logic board. The controller operates on a single +5 volt supply. Along the input of white touch screen cable are three additional wires protruding from the cable about one inch from the white NOVRAM plug. The wires just kind of hang there but are usually tie wrapped up. These orange, grey and green wires are available so 12 volts may be used to power the controller instead of 5 volts. The orange is the +12 volts, the grey is ground and the green is the Earth ground. Only one or the other power connections can be used (+5 or +12) never both. No matter which power configuration the game manufacturers chooses to use, the green wire **MUST** be connected to ground. The touch screen may be intermittent or not function at all if this green wire is not connected. Since the orange and grey wires are just tie wrapped

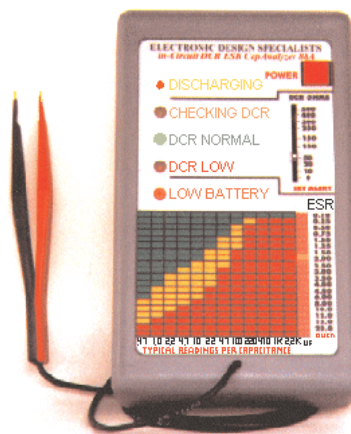
up or hanging, it's a good habit to apply heat shrink tubing to the ends of these wires (separately) to prevent them from touching something or shorting out.

On the newer IGT AVP games (which are PC based) the controller is mounted inside and on the back of the lower monitor. The top monitor does not have a touch screen or controller. But instead of having a serial output, its output is USB. The serial and USB controllers can not be swapped between different machines nor can you just cut the plug end off and replace it with the other.

If your game is an older IGT video, don't search for the controller inside the monitor. Its not there. The older IGT games use a special communication protocol for the touch screen designed by IGT and named Netplex.

No RS232 serial controller here. IGT uses this Netplex protocol to communicate with devices throughout the game including bill acceptors, printers and touch screens. The Netplex touch screen controller is not a nice little box but a large PCB mounted to the inside chassis of the monitor. This controller does have a red LED instead of the green one and it still functions the same. The large white molded plug still attaches to this PCB controller but because of its size and weight, the large white plug loosens up frequently. This causes the touch screen not to function. On some LCD monitors there is a bracket that will hold this white plug securely to the PCB. Because this controller is Netplex compatible, it uses 13 volts from the power supply for power. The orange and grey wires are still left unconnected.

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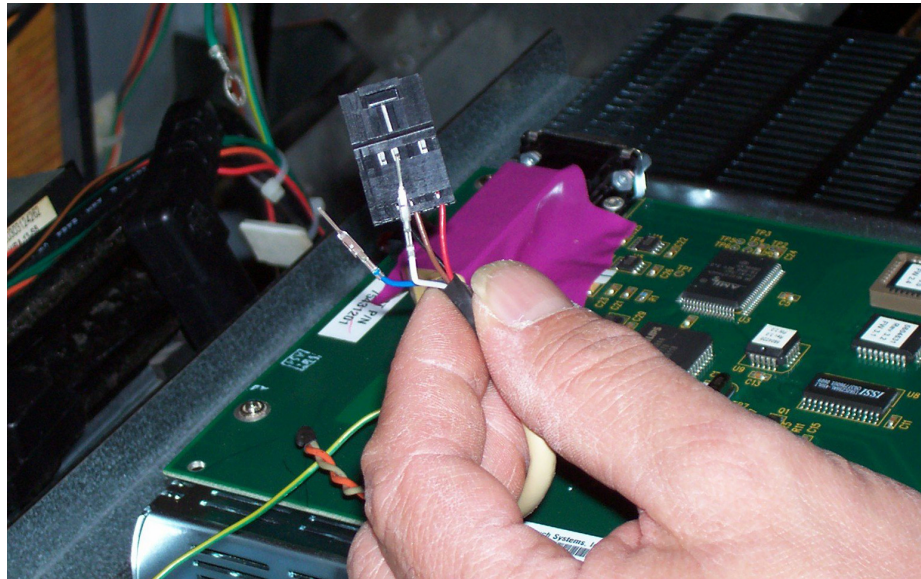
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There are two versions of the Netplex touch screen controller used. The easiest way to tell the difference is by looking at the PCB itself. The older controller PCB is stuffed full with discrete components while the newer one employs just a few surface mounted components. The part number for the older IGT controller #7542390, the newer one is # 75431200. Digitech also make a surface mounted controller, so both versions are compatible with each other.

The main difference between netplex PCB controllers is the way the touch screen is connected. The older PCB has the standard five pin AMP connector, no large white connector available. As for the surface mounted controller, both versions, they will only work with large white plug touch screens.

Recently we have been purchasing and using glass touch screens from different companies. We may need a 15" touch screen for a bar top game. On the shelf is an Optera touch screen but the game has a microtouch touch screen already installed and scratched on the game. Most of the time they are compatible but on occa-

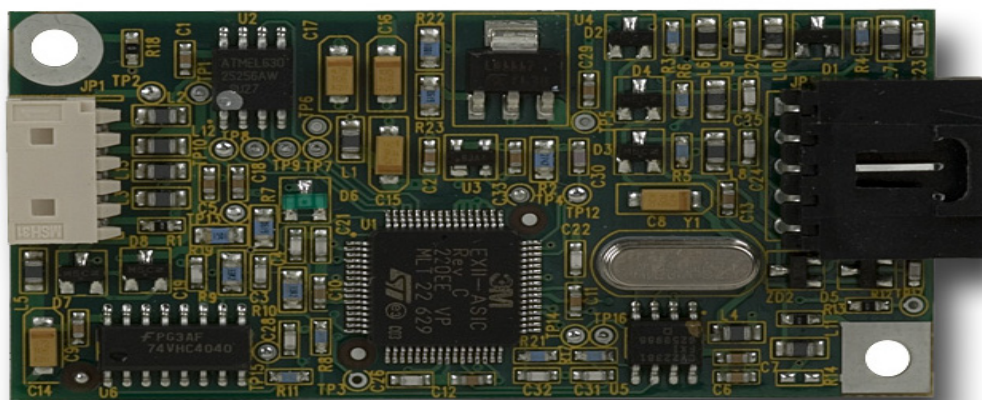


**If you touchscreen is off by 90 degrees, the wires can be swapped at this connector.**

sion there are issues. These issues are not serious and are easily remedied. In our case, we had installed the Optera touch screen and calibrated it. The calibration was successful but in the test mode, the touch was off by 90 degrees. In other words, you touched the lower left corner and the touch point displayed on the lower right corner. We touched the upper left corner and the touch was in the lower left area. Since all the newer touch screens use now use the black five pin AMP inline connector, a simple re-pin of the pins is

all that was needed to correct this anomaly. You can not re-pin the flat cable from the touch screen itself, you have to re-pin the cable (see figure 3). We purchased the Optera touch screen from AG&E. If you don't feel like re-pinning the connector, a jumper conversion harness is available.

The newest version controller is a small PCB 1.5 inches by 3.5 inches with surface mounted components. This small PCB is also made by 3M and called the EXII. So far I have seen



**The EXII Controller**



this controller used only on WMS Bluebird games. This controller is so small, that it is mounted inside the LCD on both the larger 17 inch and the smaller 6 inch LCDs. The EXII is available in both the serial RS232 and the USB versions. WMS uses the serial version. The same power LED is mounted on this board but because this board is mounted inside the LCD monitor, is impossible to see and use this LED as a visual indicator for touch screen operations unless of course, you remove the monitor black plate. Because of its size and available configurations of outputs, the EXII is fast becoming the standard of touch screen controllers used on new games.

The idea of storing the touch screen linearization data in the large white plug is now obsolete. The large white plug is only seen on older touch screens. A new five pin black inline pin connector made by AMP is now the standard. All of the touch screen manufacturers use it. Some of older touch screens made have both the large white connector and the smaller black connector. The large white connector cable connects to the new five pin AMP connector. Since the large white connector is no longer being used, the linearization data are now held in the controller. That why when you purchase a touch screen glass (from suppliers such as Suzo Happ) the controller comes with it.

If you need help in obtaining a Microtouch part number for a specific style of touch screen, 3M touch systems has come to the rescue. On their web site [www.3mtouchsystems.com](http://www.3mtouchsystems.com) is a nifty touch screen selection tool. You can select the size, where the touch screen tail or connector is positioned and several other options. Once you have entered your parameters, the Microtouch part number is displayed.

- Vic Fortenbach  
[vfortenbach@slot-techs.com](mailto:vfortenbach@slot-techs.com)



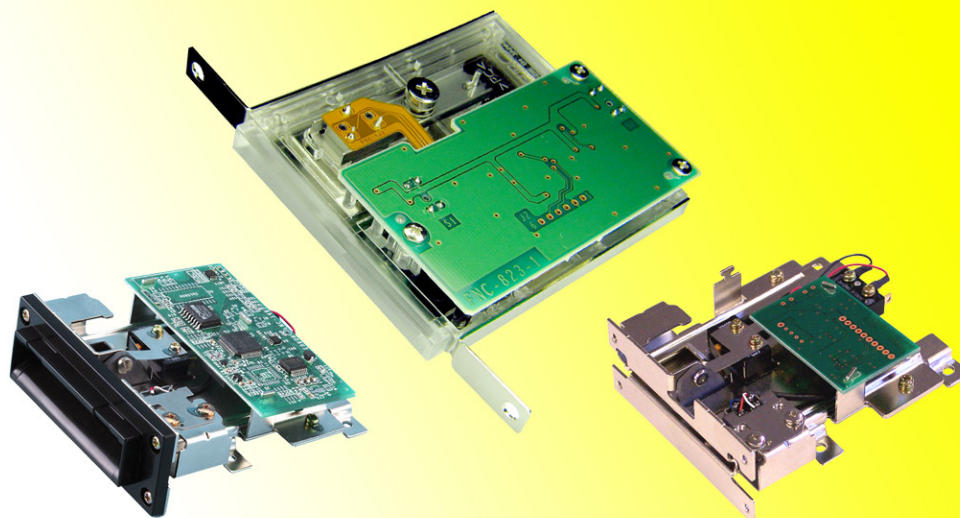
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**Washington:** Chris Riley, James Clark, John Cates, Todd Geary, Randy Johnson, Brycen Mazurek, Michael Mallory, Megon Jones, Marty Lange, Letisha Peterson



**Mole Lake:** Vince Marshall, Josh Lundequam, Emanuel "JR" Morfin, Jesse Smith, Joseph Garza

I love Washington. I'll tell you that right now. I recently completed the second of two training missions at Clearwater Casino (near Seattle, on Bainbridge Island), one in July and the other at the end of October. It's a beautiful property overlooking Puget Sound and we had a lot of fun fixing some LCD monitors, CRT monitors and power supplies during the hands-on repair lab the last day of class. We would have repaired an additional CRT monitor as well but I couldn't find a 10N60L



Mark Roberts of 3M Touch Systems stopped by the class in Washington to give a presentation on touch screen technology and troubleshooting. Thanks, Mark.



Hands-on labs make the class interesting and fun. Here, students are using a meter to test components, just as they will during actual repairs.

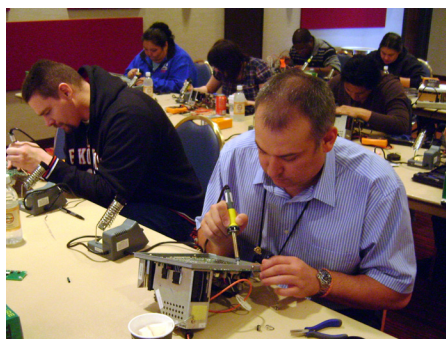


MOSFET anywhere in my supplies. Stupid. That's a common MOSFET and one that I should always have with me.

Mole Lake Casino hosted a regional Slot Tech class in October as well, at their property in Crandon, Wisconsin. I had expected more local participation but slot techs came from places like Texas and West Virginia so go figure.

A special note of thanks to my friends at Wells-Gardner for donating a mess of junk chassis that we used for our component identification and testing lab as well as for soldering practice.

These classes are really a fast, effective way to learn electronic repair. If you're interested in sponsoring a regional slot tech class at your property, contact Randy Fromm at Slot Tech Magazine. 619.593.6131



**Greg Fisher hard at work on a monitor chassis during one of the hands-on labs that make the class fun.**



**Washington: Loretta Conville, Randall Smith, James Guarino, Bruce A. Nelson, Dani Alexander, Vander McInnis, Gregory Fisher, Rochelle Stockwell, Al Ruiz, Brandon Ellison, Nick Sorenson.**

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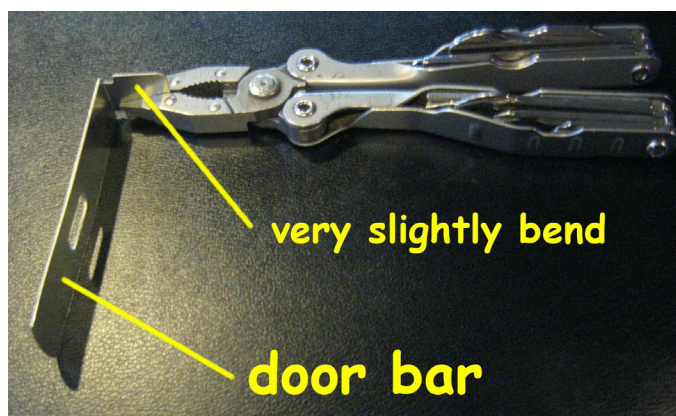
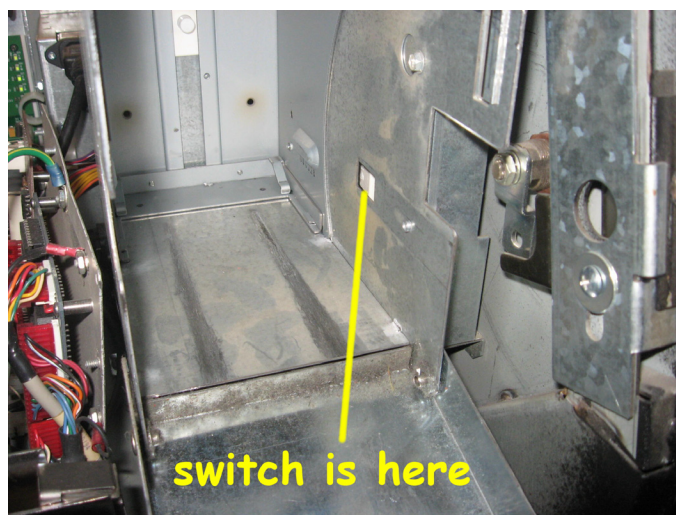
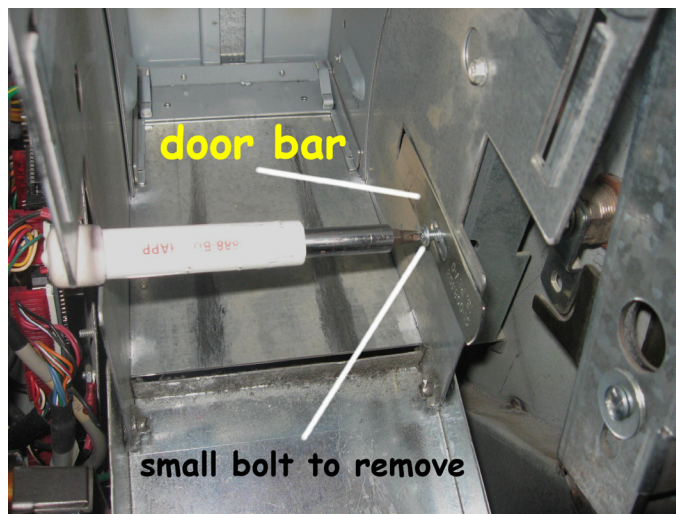
## Quick & Simple Repairs #57

By Pat Porath

### IGT AVP Door Open M

I think I can safely say many of us have dealt with “door open Ms” on slot machines. This time it wasn’t so easy to repair. The main slot door optic adjustment and tests of other switches didn’t help at all.

The game was an IGT newer AVP upright (we call them 2.5s, the kind that the button panel flips down) and I took a look at all of the door switches (so I thought) and didn’t see a problem. From what I was told, the door optics have been replaced too. Another tech checked out the game, doing the usual checks of switches, and found one that I didn’t even see. The small micro switch is located in the middle area of the button panel door and the metal tab on the switch needed to be bent slightly so that when the door pressed on it, it showed closed. When the button panel was locked back in place and the main door closed, the “door open M” was gone. The small switch (under the player buttons) only needed to be “tweaked.” If you run into a “door open M” on a newer AVP, the small micro switch may be to blame.





### **Bally S6000 “Monte Carlo” Display Problem**

On this specific “Bally Monte Carlo” (with the bonus wheel on top) and a stand alone progressive game, the progressive display would go black (The display is located in the “top glass” area). It seemed like once a week or so we could get a call that it went out again. What was the problem? The unit appeared to lose power for some reason. When the two pin power connector was unplugged and plugged back in, it would work for a while. Sometimes even if the connector was wiggled a bit, the display amount would come back. It was definitely time to check further on why it was going black. Upon closer inspection of the progressive display board, two cracked solder joints were found in the power area. The two pins that the power connector plugs onto had loose, cracked solder joints! No doubt this was causing the problem. After the unit was re-soldered, the display was fine. Kind of logical, the display appeared to have a power problem so why not look at the power area on the board. The display has been in the game for at least a week, and no complaints yet.

### **WBA Capacitor Problem on Older Models**

JCM has found a problem with a capacitor in WBA CPU boards made before June of 2005. Not all WBAs but ones with serial num-

bers that are lower than 0506xxxxxx. These specific boards were made with an “Elna” (small, flat) cap. The top of the tab looks sort of like a bow tie. This is how it can be identified. According to [jcm-american.com](http://jcm-american.com), testing has shown that these specific caps may fail over time causing a data loss. The cap was replaced with a “Panasonic” one that has a “straight” tap on top of it. JCM has replacement caps which is part number 451-100130R. More information can be found at [jcm-american.com](http://jcm-american.com).

### **A Game That Needed Some Work**

The original call to the game was “no Oasis display.” When I arrived, I found out that the Oasis display had a loose connection. Problem solved right? Not quite. When I checked to see if I had a “slot door open” and “slot door closed” on the Oasis display, it didn’t show that the door was in fact open. This was a problem. As a reminder, when the Oasis System AKA. “CDS” doesn’t show a “door open” and “door closed” like it is supposed



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to, there is a very good chance that the game has lost communication with the Sentinel or that the Sentinel has lost communication with the game, whatever the case may be.

The first thing I tried was to reboot the Sentinel but this didn't help. The next thing I did was to reboot the game. On a rare occasion, I have run into a few Bluebirds that lost communication with the Sentinel and a simple reboot of the game did the trick. In this case it didn't help. Next I checked the game interface cable. This is the cable that connects the game to the Sentinel. All of the connections looked fine. One end of the cable is on the backplane board of the game and the other two connectors are on the Oasis side. One is connected to the Sentinel and the other is on the SMI board.

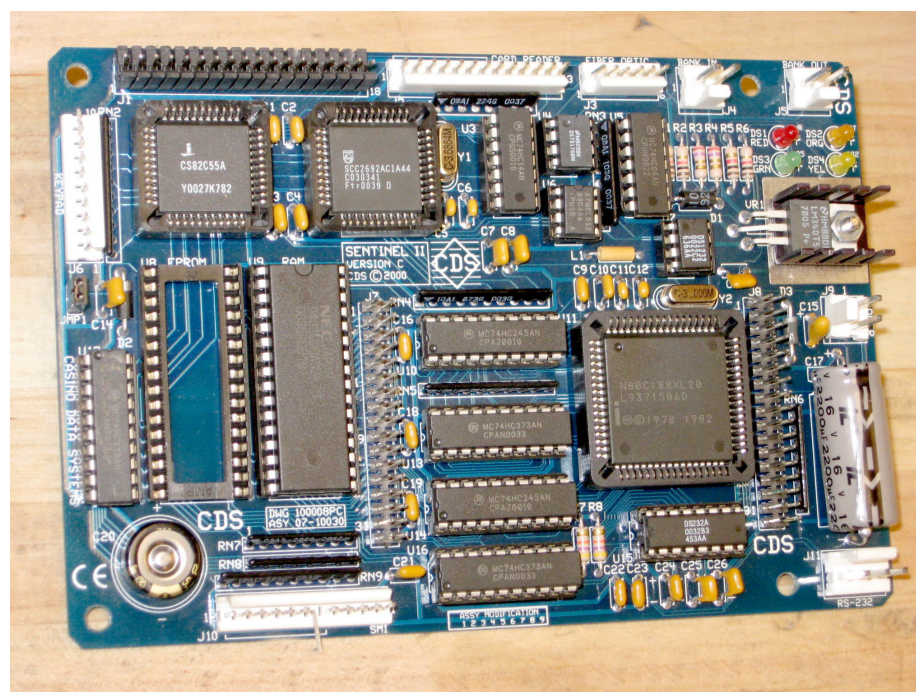
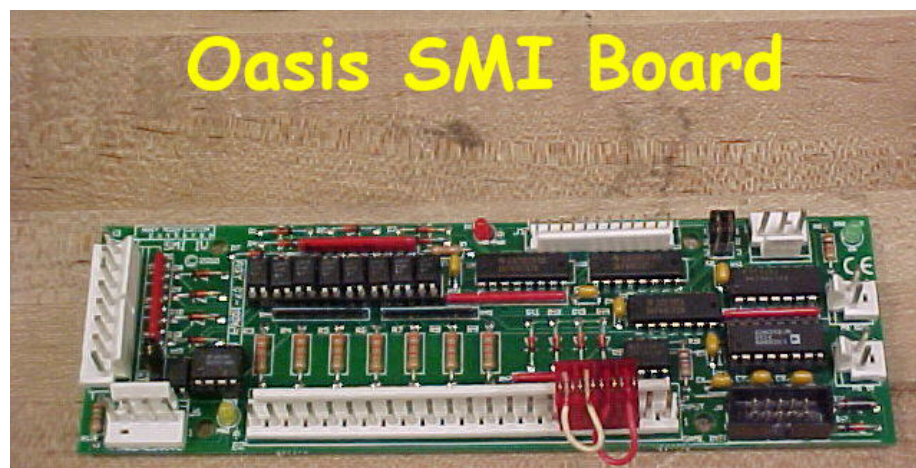
Now what? Well, I tried to RAM clear the Sentinel, which didn't help either. I also replaced the Sentinel along with the Sentinel EPROM. Maybe for some weird reason the EPROM went bad? No luck there either. In my personal opinion it is pretty rare but why not replace the Oasis SMI board? I grabbed a spare and put that in, powered up the Sentinel once again and waited for a few minutes. FINALLY, when I physically opened and closed the slot door, the Oasis display showed an OPEN and CLOSED door. This meant that communication between the

game and the Sentinel had been established. Like I said, kind of unusual (in my opinion) that the replacement of the Oasis SMI board fixed the problem.

### **Progressive Bank of IGTs That Lost Oasis Communication**

This bank of games at our casino is known as the "Prize Bank." We have had a variety of items at it over the years. Such items include: cars, vacations, golf carts, cash, big screen TV and entertainment center including a massage re-

cliner, side by side four-wheeler and other items. The problem that I was told about was Oasis communication after the Sentinels were changed on the bank. All were changed but one (some kind of accounting problem happened with the games, I guess) so we were asked to change all the Sentinels on the bank. Before I changed the last one, I wanted to get the bank communication established again. So, if all were changed except one and communication was lost, why not check the last game that was worked on? I





opened up the game to look at the Sentinel board and to my surprise, the problem was right in front of me. By accident, the COM out cable had been put on backwards. This would bring down the whole bank. Not long after the connector was put on properly communication was established. Just to double check, I looked at the Poller and the whole bank of games appeared in yellow. On our system, when a bank appears in yellow, it means the games are working and communicating properly. When the games show as the color blue or black, it means there is a problem somewhere. After looking at the Poller (which looked good) I knew the games were back online. Later in the day I replaced the last Sentinel in the bank without any problems.

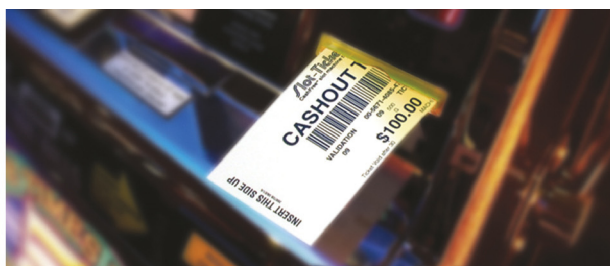
### IGT Game King Multi-denomination version 6.0

The IGT "Game King" has been on the market now for at least ten years that I know of, so what's so special about the "Game King" version 6.0? One machine that we recently did a conversion on has a total of 34 games on it! Yes, 34 different games! The denominations vary from 1 cent to 25 cents on the bank of games we did. I think they are very, very cool games. While sitting at ONE slot machine, you can go from playing a three reel video slot, to a five reel. No luck there? Try some video poker such as Jacks or Better or Joker Poker.

December 2009

Maybe video keno is your thing? Multi-Card, Cave-man Keno, or Extra Draw keno. The game even includes video Blackjack and a host of others, so many that my editor (who pays me by the word) won't let me list them all! Shall we say, "IGT Game King 6.0, the King of Games." I heard it took a half hour just to make a copy of all of the PAR sheets. It took me quite a while just to verify the options and setup of four games. (When we verify a game at the casino I work at, a different technician verifies that a game is optioned correctly. Such as the correct pay tables, correct max bet, correct denominations, the type and version of bill acceptor, the lockup amounts, and

other things.) We converted one side of the bank which was four games one day and the other side the next day. Luckily all that needed to be replaced was the flash board and of course, chips. (The "piggyback" board that sits on top of the main processor board.) We weren't sure if we had to replace the motherboards or not. They came with the conversion kit but on our games, they didn't need to be installed. Those who have replaced motherboards in games know that sometimes they can be quite involved. It will be interesting to hear customers different responses to the games.



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## WMS Bluebird Stacker Door Switch Adjustment

On some of our WMS Bluebird games, periodically a small letter "V" will appear on the game display. As most of us know, this means that the game has or "thinks" that the stacker access door is open (This is in reference to the Bluebird upright games). When the stacker access door is open, there is a rectangular shaped thin metal bar that moves inward and outward when the door opens and closes. One thing to check, is to see if the small bar is moving inward and outward without obstruction; it should move freely. When the stacker access door is closed, the bar is pressed inward and in turn pushes on a cherry switch which is located to the right hand side toward the back of the game. When the bar pushes on the cherry switch, the game shows that the door is closed. When the door is open, the bar is released forward by the use of the spring which is located inside of the cherry switch (a common white "push-pull" switch). What we have found, from normal use (could be from

slamming the doors) that the small metal bar may need to be adjusted. With the stacker access door open, you will see a small Phillips screw that holds the bar in place. Remove the screw and gently take the bar out of the game. On the end that pushes on the cherry switch, SLIGHTLY bent it so it pushes on the switch a bit more. Only bend it around 1/8 or 1/4 inch. Too much will break the switch when the door is closed. All that needs to be accomplished is slightly more pressure to be applied to the cherry switch when the door is in the closed locked position. This seemed to have helped with our "door open V" problems.

## WMS Upright 550 - Black LCD

While taking a walk on the gaming floor, I noticed that an upright WMS video game had a black LCD. Upon opening the door, even the power light for the LCD was black. Well, how about the "infamous" re-boot? I turned the game off then back on. Now not only was the LCD still black but the game lights were out.

All that was lit up were the bill acceptor and the printer bezels.

What the world happened? Did the power supply decide to fail? I turned the game back off and checked all of the connections on the power supply and they all looked nice and snug. I was going to swap power supplies at this point but decided to hold off and check more things out on the game. My experience with the WMS power supply is they are all or nothing, either they work or they don't and it powers pretty much the whole game. Why were the bill acceptor and the printer bezels lit but not the LCD and the game lights? How about taking a look at the LCD? Maybe, just maybe there would be a logical explanation why it was black. Ah ha! This could be it. The power cable wasn't pushed in all the way for the LCD. I pushed it in like it was supposed to be and bingo! It lit up! Now, what is the deal with the bulbs? I removed the top glass of the game to check it out and what did I see? NO STARTER FOR THE BULB! Thinking "technically" I was definitely wrong with my "power supply theory." In conclusion, all that was wrong, was a loose power cable on the LCD and the bulbs needed starters installed but the combination of the two pointed elsewhere.

- Pat Porath

- pporath@slot-techs.com







At G2E 2009, JCM Global unveiled two revolutionary new products: the iVIZION™ bill validator and the Sentry 2.0™ bezel that up the ante in performance and capabilities.

First is iVIZION, which forever changes the way the gaming industry sees banknote validation. It is the foundation of intelligent validation and, according to JCM, “sees better, thinks smarter and runs faster than any comparable product in the industry.”

iVIZION's ability to see better comes from its Contact Image Sensor (CIS) Technology, combined with transparency and reflective sensors that scan 75 times more data points than competitive products. The result is the most powerful sensor capabilities available, giving operators a 99%+ acceptance rate on valid banknotes and the most diligent counterfeit protection.

CIS captures 100% of the full front and back image of a banknote or ticket, resulting in faster banknote-to-banknote processing speed, and a 99%+ acceptance rate. Quicker dispute resolution and validator operation comes from incorporating the Sentry™ bezel where slot floor personnel can see any operational error or show customers the last banknote inserted without opening the machine.

## Slot Tech New Product - iVIZION from JCM

iVIZION is designed with the widest banknote path entry, allowing quicker and easier banknote insertion and can optically align the banknote's or ticket's image for optimum data validation and fastest processing.

Inside iVIZION is the best security combination in gaming: a combined optical and patented mechanical anti-stringing device that detects and prevents manipulation or mechanical cheating.

Backed by 20 years of JCM Global currency software development, iVIZION thinks smarter than any other bill validator. Thinking smarter starts with its RFID Intelligent Cash Box (ICB®). Each transaction is captured and stored on the cashbox for the most secure and robust data reconciliation possible. This unfiltered baseline data gives a redundant source that streamlines the reconciliation process. Additionally, the ICB gives extensive, detailed reporting to slot management that is encrypted and web-enabled for easy access.

Next, its 64 megabit FLASH memory recognizes and validates more banknotes, meaning greater validation optimization. The large memory also means iVIZION is prepared to accommodate future enhancements. Its sensor package is smart enough to self-calibrate, reducing maintenance and resulting in increased uptime and maintaining a high acceptance rate. Its 600 and 1,000 banknote cash box is compatible with all current supplier cabinets and was designed at the optimum size for gaming efficiency.

iVIZION is smarter because it has a component modular design. That means when future enhancements are implemented, only the component affected



Jack Geller demonstrates iVIZION at G2E

would need to be replaced, not the entire bill validator. This results in greater design flexibility, reduced down time and reduced cost of ownership. Last, its barcode reader can think both horizontally and vertically, so operators now have greater flexibility in designing promotional coupons that can be accepted at the slot machine.





iVIZION runs faster than any other bill validator because it has two high-speed processors, one of which is solely dedicated to banknote evaluation. This delivers the highest acceptance rate, better counterfeit protection and open memory bandwidth for future enhancements. Its sealed 85 mm banknote path is the widest opening on any bill validator in gaming, providing easy banknote entry, and because it is sealed, the banknote path is dirt and liquid resistant, resulting in less service-related down time, lower cost of ownership and maintaining high acceptance rates.

JCM's patented and proven removable stacker mechanism gives slot techs easy access to critical components, resulting in greater uptime and an optimum data capture. iVIZION was created with a "Blind Mate" and "Hot Swap" design for ease of access, giving operators the ability to pull components without powering down the machine resulting in greater earning uptime.

iVIZION is fully compatible with all gaming protocols and interfaces and delivers all the industry standards for easier OEM integration. Additionally, iVIZION deploys JPL, or JCM Private Line, for transmission of custom transaction management application data and future enhancements.

iVIZION is the foundation of intelligent validation and was built to be future-proof. Because it offers both open and proprietary data protocols, the development roadmap includes implementation of Sentry 2.0™ today, Managed Services tomorrow, and other operator and player enhancements in the future.

In addition to iVIZION, in JCM's booth is the incredible new Sentry 2.0, the next generation bill validator bezel. Today, bezels play a critical role in guiding and educating the player on a slot machine via iconic symbols, flashing lights and subtle reminders. Bezels also aid floor techs with self-diagnostics and can display the denomination of the last banknote played.

The Sentry 2.0 bezel brings that interactivity to a new level utilizing high resolution, high contrast, two color LCD. The player-friendly interactive messaging is noticeable immediately, and, because it is con-

trolled by the bill validator, absolutely no changes to the game software are necessary.

The Sentry 2.0 bezel is customizable and easily programmable so an operator can display a wide range of messages – such as the property logo or a good luck message – all in bright, fully functional two-color LCD graphics. When the bezel is in attract mode, it operates at full light intensity; when a player begins to play, the bezel automatically dims to create a more comfortable gaming experience.

The Sentry 2.0 is designed to accept banknotes and tickets up to 85mm wide, and incorporates multi-currency and multi-language support. The original

release will support English, French, Spanish and simple Chinese, which can be displayed one at a time or in concert, such as English/Spanish or English/French.

Using the new IR secure JCM keyfob, Sentry 2.0 helps to quickly settle customer disputes. Attendant messages are clearly displayed at the push of a button. Events such as the last banknote in are shown on the display. Key items such as the denomination, the direction of insertion (face up or down), and the elapsed time since the last banknote was inserted are shown on the LCD for both player and attendant review. - **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](http://slot-techs.com)

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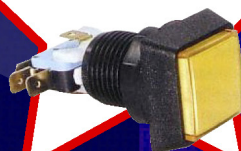
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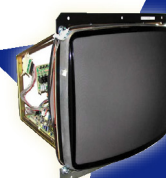
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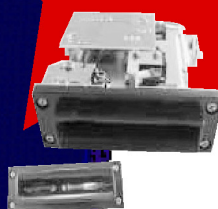
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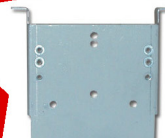
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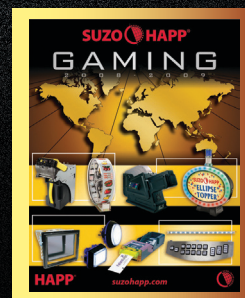
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