

February 2012

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Slot Machine Technology for the International Casino & Gaming Industry

## The Viridian

Slot Tech Magazine

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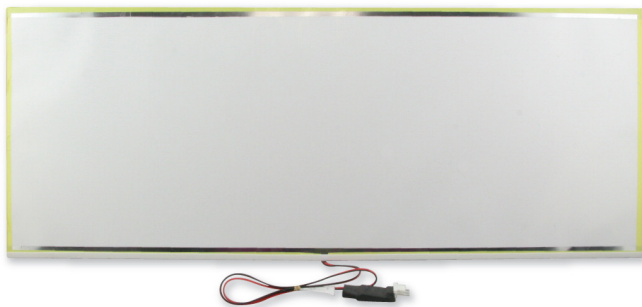


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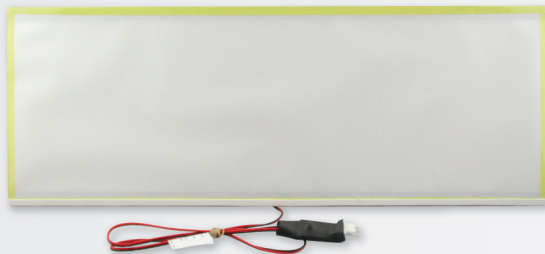
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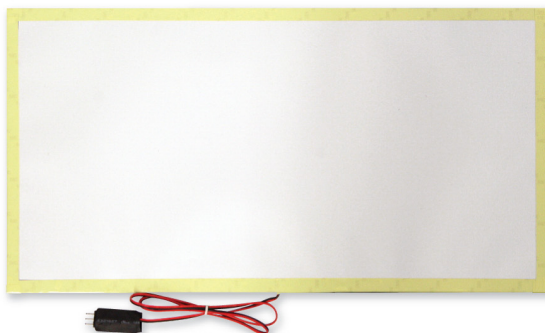
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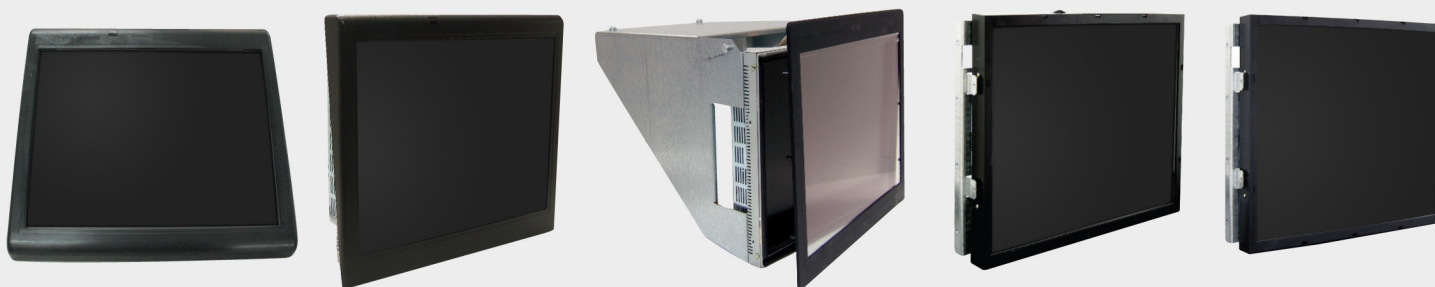
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## Slot Tech Magazine Editorial



Randy Fromm

### Randy Fromm's Slot Tech Magazine

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TechFest 25-Las Vegas

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November 6-8

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for the Slot Technician

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Simple

Repairs #82

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Dear Readers,

I was pleased to open my inbox and see a contribution from Slot Tech Magazine's favorite Maltese correspondent, James Borg. To quote from the website, "With Mediterranean summers and mild winters, a rich culture and fascinating history, Malta can be both idyllic hideaway and a cosmopolitan center. The Maltese people are well known for their friendliness and hospitality."

The small island nation has a few casinos on it. James works at the Oracle Casino. The Oracle Casino is on the northern coastline of the Island, an area called St. Paul's Bay. It forms part of the Dolmen Resort Complex, one of the best four-star resorts in Malta.

This month, James has a story about an Aristocrat Viridian repair. He always strikes a nice balance between being somewhat technical and very entertaining. Read "The Viridian" beginning on page six. Thanks, James.

You will notice some new support from our old friends at Suzo-Happ this month. Please take a look at their new "LightPro" system for slot glass illumination (look for a feature on this product soon) on the preceding page and please tell 'em you saw it in Slot Tech Magazine when you order some. They are also featuring Ceronix monitors (the "Cadillac" of monitors and sponsor of Slot Tech Magazine's free, solar-powered technical server at [slot-tech.com](http://slot-tech.com)) as well as their new "Celebration Topper" on the back cover. Thank you, Suzo-Happ, for your amazing and continuous support of Slot Tech Magazine (since 2001!).

*Randy Fromm*  
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# The VIRIDIAN

By James Borg

I have come across many a situation, where try as I might, whilst pulling all the strings within reach, the outcome still isn't at all as hoped for, especially if something should be pretty straightforward and without any evident complications. That, however, is what makes life as a slots technician exciting and fun. Or does it? Weekends here in Malta are usually much busier than normal working days. With crowds swarming in their hundreds, the probability of coming across the occasional one-off unfortunate and difficult client can make a rather loud and unwelcome noise. This would be especially more so if the mentioned client has had a long list of unlucky strikes during such a visit and blaming the blameless slot machine (or even me) for his shortage of prosperity only adds to the pandemonium. One such ill-fated client happened to be on one of the many Viridian machines we have in our casino. They're brilliant machines and as far as I can remember, none of

them have given me any headaches, that is, until one particular evening. And true to the saying, it just doesn't rain, it pours, and boy did it pour that evening. My shift started off pleasantly, with my going 'round the premises checking that all was fine. Clients were playing away happily and not needing anything when I heard the distinct noises of an Aristocrat spluttering sad noises. Making my way to where the noise originated, I came across a flustered man in his late fifties who was hitting the PLAY button like a lunatic. He seemed lost and kept alternating his gaze between the stationary reels and the button he was hitting without mercy. On approaching the scene of the trouble, I realized why the constant hammering on the button wasn't having any effect on the reels and no, it wasn't a case of the machine running out of credit! That sort of thing doesn't happen in our

casino. It had stopped on a 'Door Open' error. Nothing just a simple reset couldn't rectify. The client grumbled something to the effect of 'crappy machines' but carried on playing while I made my way to another part of the casino, on the lookout for a new adventure, a new beginning, something to trigger my juices to keep on flowing. Moments later, I was called back to the same machine as the client encountered difficulty once more and couldn't play any longer on it for some reason or other. Oh dear. I found that the same error had surfaced again and the poor buttons had been subjected to yet another hammering. Politely explaining to the client that there was no real reason to bash the life out



Fig. 1 – Buttons on the Viridian



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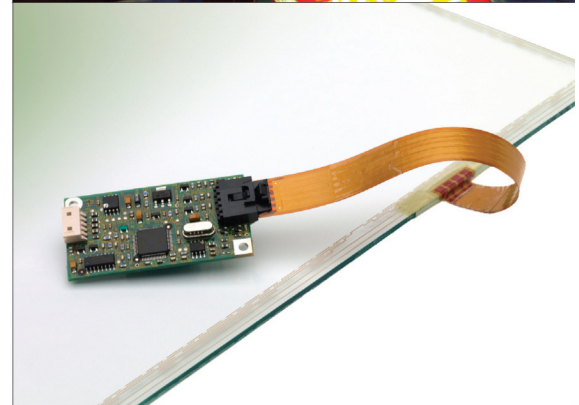
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of the buttons sometimes has the desired response from the client but sometimes it doesn't as once my back is turned, the hammering starts again. I clearly highlighted that if the buttons end up getting broken, the client will have to remain without his machine until the damage has been rectified accordingly. I gently explained that his fists could also end up being damaged as there are bound to be sharp edges protruding out of a wrecked button cover. I had the relevant spares in my workshop so it wasn't a big deal for me to replace them. I was more concerned as this particular client didn't seem to be the very patient or



Fig. 2 – FUBAR Switch

understanding type. Another reset got the machine back into play mode again. I wondered why it had stopped on 'Door Open' since I had checked the door myself a few times and no errors had surfaced for me. Informing the client to contact me again should the same thing happen, I moved along, keeping my fingers crossed that I wouldn't be called over once more in a hurry. As luck would have it, I was. This time, however, the PLAY button wasn't working for a good reason. It was broken--wonder of wonders, and other similar expressions of utter and total disbelief. The words 'I told you so' echoed in my mind several times but that wouldn't have done any good at all. After a quick trip to the office to get some tools, I had to take out two screws from the back to release the button panel.

On these Viridians, unless you have extremely small hands, getting close to replacing a faulty switch

would remain just a dream which never materializes, unless the whole panel is pulled free. Replacing the actual switch only involves turning it a 90 degree turn and it pops out. While at it, I also had a proper look at the door switches to see why it was giving me that error. I'd hate to have to replace the button switch again after a few minutes. As with other Aristocrats, Viridians have a door switch which works on optics and this consists of an infrared transmitter and receiver, with a prism on the door to reflect the light path (see figure 4).

As is the case, especially in a smoky environment, dust accumulates in and spreads nicely on the optic circuitry and, more than anything else, on the actual prism itself. This leads to a greatly reduced amount of light getting through to the receiver, which can easily lead to problems with the door, like, for instance 'door misalignment' problems, or other issues. A quick dust



Fig. 3 Left and right button panel screw





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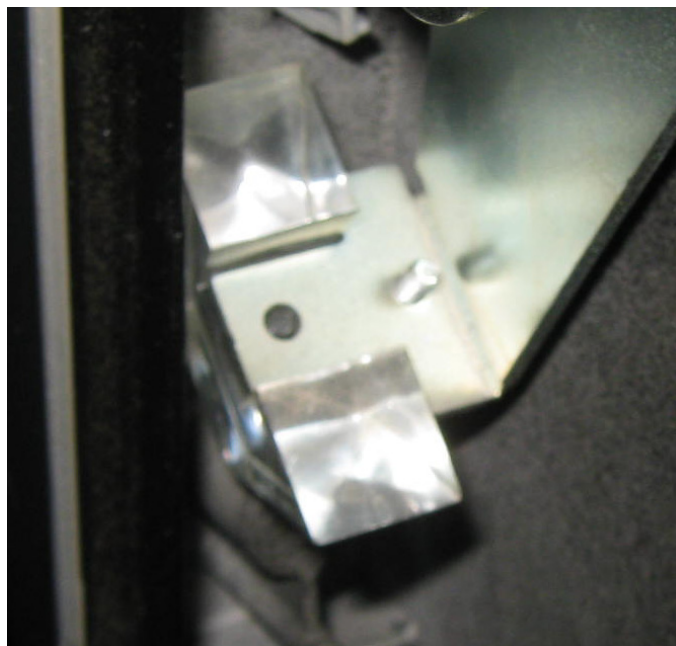
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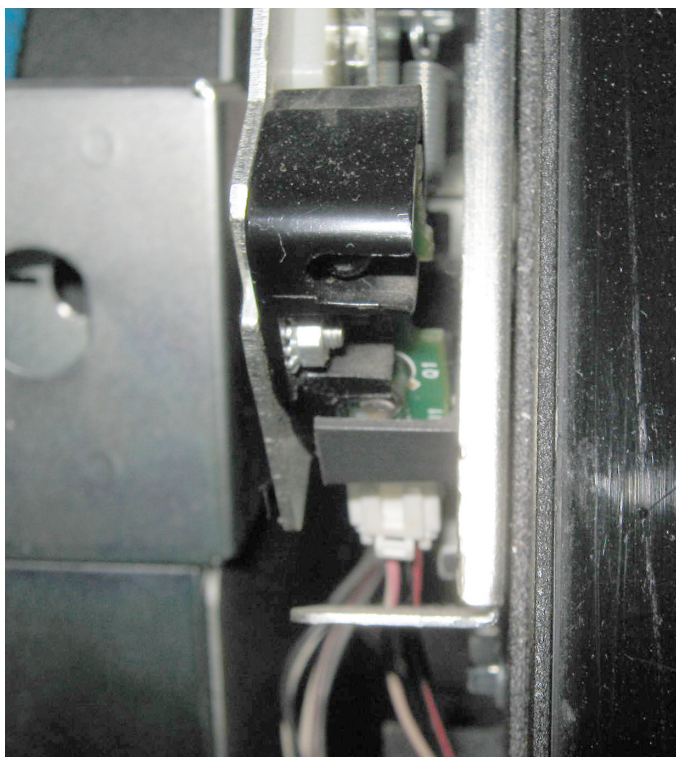
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on the optics and checking the mechanical switch in the process, the machine would then be ready for action once again. I really do enjoy turning the machine off when I'm replacing these switches. I'd hate to short something along the way and end up with the subject exploding itself into a swirling mushroom of smoke, apart from sending my pride and image flying out of the nearest exit. However, while it's always a good policy to follow, this time I honestly wished I hadn't. Something kicked me hard in the stomach as I suddenly remembered that I had heard somebody mention the fact that this particular machine sometimes refuses to start up. As it would have it, I had forgotten all about it before I actually turned it off. It was a blessing that the client had nearly run out of credits and was going to move away from it in the first place. It's not that I'm pessimistic or negative or anything to that effect. I always try to refer to a half bottle as half full (most of the time, anyway). It's always better to be safe than sorry and if the machine doesn't start up, I'll be very disappointed to say the least and the client would think that I didn't want him to play on it anymore, since I had caught him bashing the life out of it before. It would take a full manuscript to explain the fact that the switch needed replacement and the optics were, in fact, dirty, and I had had to turn the machine off purely as a precaution. True to real-life drama in its moment of culminating climax, I turned on the machine after everything was re-assembled and lo and behold, NOTHING happened! Aaarrggghhhh! So much for 'the bottle being half full.' A quick smile of assurance towards the client didn't make me feel all that brilliant and his body language was sending some really nasty messages back. Another attempt at purring it to life was useless. There was really no way out of this. I had to break the sad news, very slowly and very diplomatically, in the best way I knew how. I couldn't really promise the client that his machine would be up and running before his time to leave but promised that I would start on it pronto, which I did. I opened up



**Fig. 4 Prism on the Belly Door**

the belly door and upper door for some sign of life but none was present. Only the red light on the power on/off switch was lit. Fair enough, a FUBAR power supply unit. Not very pleasant as I didn't have a spare unit available so I decided to pull it



**Fig. 5 Optics inside cabinet**

out and have a look inside. With any luck, it could have blown a fuse, but of course that was a load of rubbish as, if it was indeed a fuse, it would have surely blown



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**TechFest 25-Marriott Hotel**

**Las Vegas, Nevada/June 5-7, 2012**

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**Thank you, thank you,  
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The positive reponse to TechFest has made it difficult to hold just two events this year. I have been invited to bring the event to Motor City Casino (that will be TechFest 26 in November) but since TechFest 23 sold out, I have planned another event in Las Vegas to cover the folks that were turned away. In addition, I have been invited by Hard Rock, Tulsa to hold an event there (they actually will be sending many techs from many of their properties in Oklahoma but the event is open to all slot techs from all properties). That makes four TechFest events this year. There are no plans to make this a regular schedule.

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for a good reason.

I smiled a warmer smile at the client but I got the same body language messages coming back again. Oh dear! I quickly pulled out the supply and dashed off with it to the workshop, all eager to open it up, find out what's wrong with it, and dash back to the client with it all repaired. That was the plan. It was supposed to be simple, straightforward, to the point, direct, clear-cut and certainly uncomplicated. WRONG! It was far from all those positive things just mentioned. I know it should always be a case of the bottle being half full, but sometimes it can also seem half empty.

I had a look to see if I could find any information at hand on this power supply unit but didn't have anything on my computer, apart from the PSU from the MKV which although physically they have some similarities, the circuitry surely would be very different.

Without any schematics available for this unit, the only thing I could really do was to give it a visual, have a sniff around and go 'round the obvious things that could have caused such a state-of-the-art PSU to die off. I went 'round the mains input circuitry, covering the fuse, the bridge rectifier, the thermal fuse, safety resistors, filtering

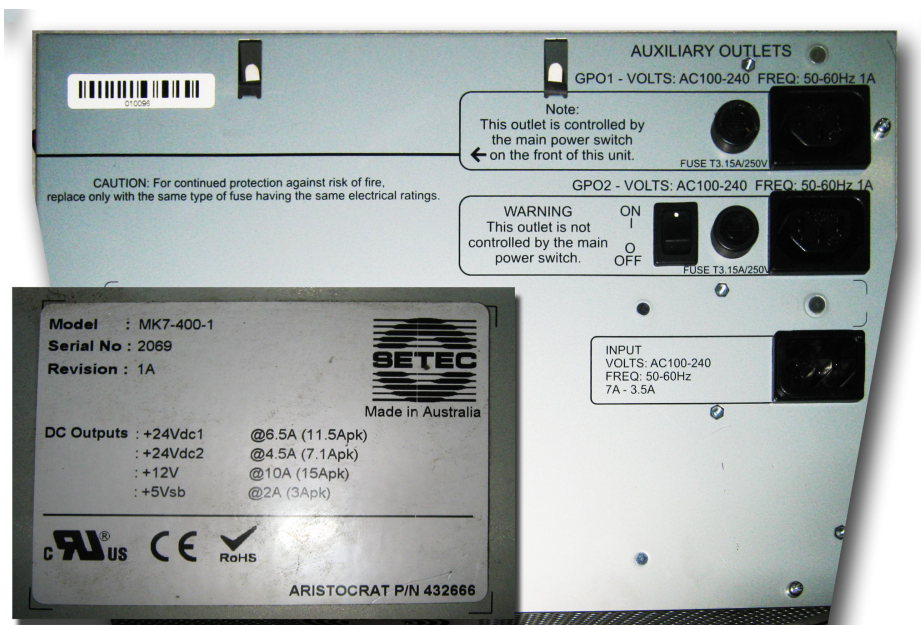


Fig. 7 Viridian PSU



Fig. 9 Viridian PSU from the inside

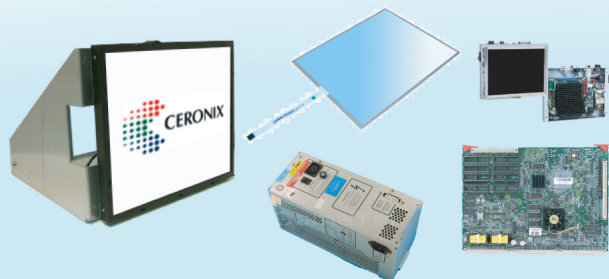
capacitors, chopping transistors but found nothing. The hot side of the supply 'seemed' intact, so it was best to have a look at the secondary rectifier circuits. As with the hot side, the secondary 'seemed' fine as well. At that point, there was pulling of the face, scratching of the head, sipping of some tea and

filling my breathing space with a white cloud of smoke from my ciggie. The four corners of my world were slowly coming towards me, reducing my options drastically. Then an idea hit me. Why not try this PSU in a working Viridian? At least, that way I'll be sure that the supply itself was, in fact, FUBAR, and not waste



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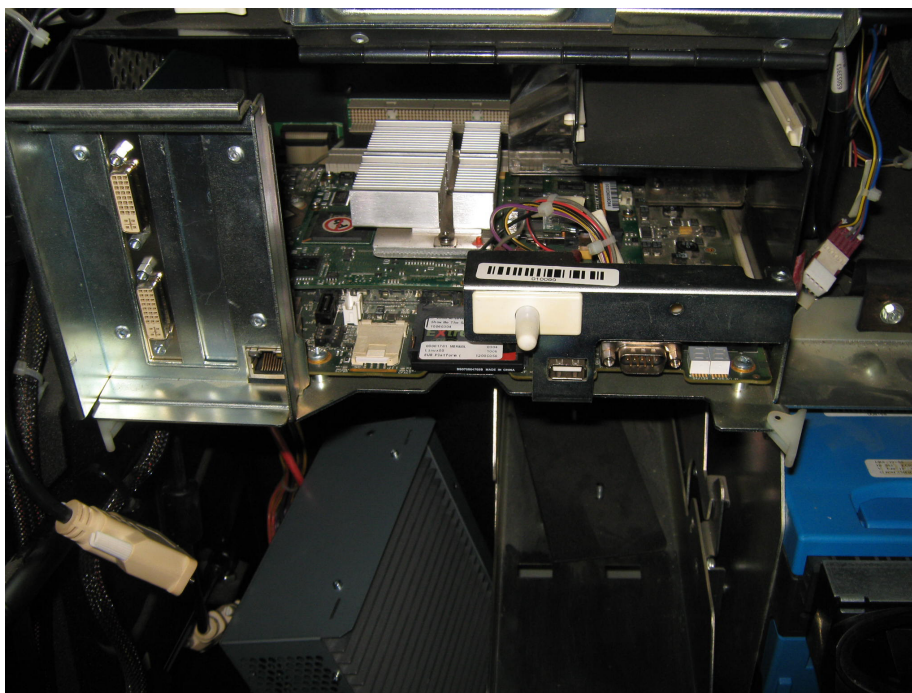
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precious brain cells on something which 'might or might not' be FUBAR in the first place. Opening up the first vacant machine, I quickly switched the connections from its own working supply, to mine. The machine started up perfectly. But then I had another thought. All those thoughts were tiring me out. What if, just what if my supply was, in fact, FUBAR, and had decided to start up normally merely for that test? After all, it was said that it 'sometimes' didn't start up. The only way out of this was to pull out the good working PSU and quickly run over to my dead machine and try it in there. I plugged it in and held my breath before turning it on, always with my finger on the red button. It was a decisive move, as this will tell me what my next step to take would be. If the working supply worked on the dead machine, then it was a supply all along (I deduced). If the good supply still didn't get the dead machine to start up, then it would be a machine problem in itself. How's that for logic? The client happened to come round to check on my progress just as I had arrived at his machine and I explained that I was doing all I could do under the circumstances. I mentioned that if what I was then doing doesn't work, I'd have to see to the problem in further detail, which would mean he won't be able to play on it any more. I

couldn't quite decipher his body language messages being transmitted after my comments but I was pretty sure they meant 'Please, take your time. I understand perfectly the situation, and this sort of thing happens.' I kept hearing the words 'Half full, half full, half full' echo in my mind. As luck would have it (or not, as the case might be) the machine still didn't start up with the good PSU in it. 'Not being very amused' would be the understatement of the century, as not only did I have a problem facing me with the machine itself but also some more body language hitting me below the belt. There wasn't a great deal more I could do just then and I apologized to the client, telling him that it's a serious matter and has to be taken one step further. After eliminating all that I

could eliminate from the machine, anything that could in some way or another effect the start-up sequence, the poor thing still didn't come to life. I started to panic slightly as the only thing left in it was the Carrier Board (motherboard) itself (see figure 9).

Pressing down all the components that could have possibly popped out because of vibrations didn't do one single bit of good as dead the machine was and dead it remained. On the right-hand side of the board, there are two, 7-segment displays displaying '88.' I didn't like that number where motherboards were concerned, as it usually spelled out trouble. A quick dash to my workshop to get the intelligence to decipher these codes only highlighted my worst fears.



**Fig. 9** A look at the Carrier Board inside the Logic Cage



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#8610- Protective Mylar sheet W/ copper tape attached for 6.2" Hitachi LCD in IGT NexGen

#8570-6.2 inch Hitachi LCD #TX16D11VM2CAA with 4 wire touch screen for IGT NexGen

#### FOR BALLY

#8650 - Single cold cathode lamp assembly for Bally IView player tracking system 6.2 inch "IDW" LCD

#8680 -- Single cold cathode lamp assembly for Bally IView player tracking system 6.2 inch "IDW" LCD

#9890 – 5 wire touch screen for Bally IView 6.2 inch Hitachi LCD

#8950- 5 wire touch screen kit for Bally Iview 6.2 inch "IDW" LCD

#1240 – 6.2" Hitachi LCD \$TX16D11VM2CCA

#### FOR KONAMI

#9780-"L" shape cold cathode lamp assembly for 7 inch AU Optronics LCD

#8550 – "U" shape cold cathode lamp assembly for 7 inch Sharp LCD

#1010 – 7 inch AU Optronics LCD #C070VW02 for bonus screen

#1250 - 7 inch Sharp LCD #LQ070T3AG02 for bonus screen

#### FOR WMS (Williams)

#8520- Triple cold cathode lamp assembly for WMS slot machine with an 18" LCD monitor

#9300- Single RAW cold cathode lamp for WMS games with 19 inch LCD monitor

#8490 - 6.4" "LG" LCD #LB064V02 for bonus screen (does **NOT** come with touch screen)

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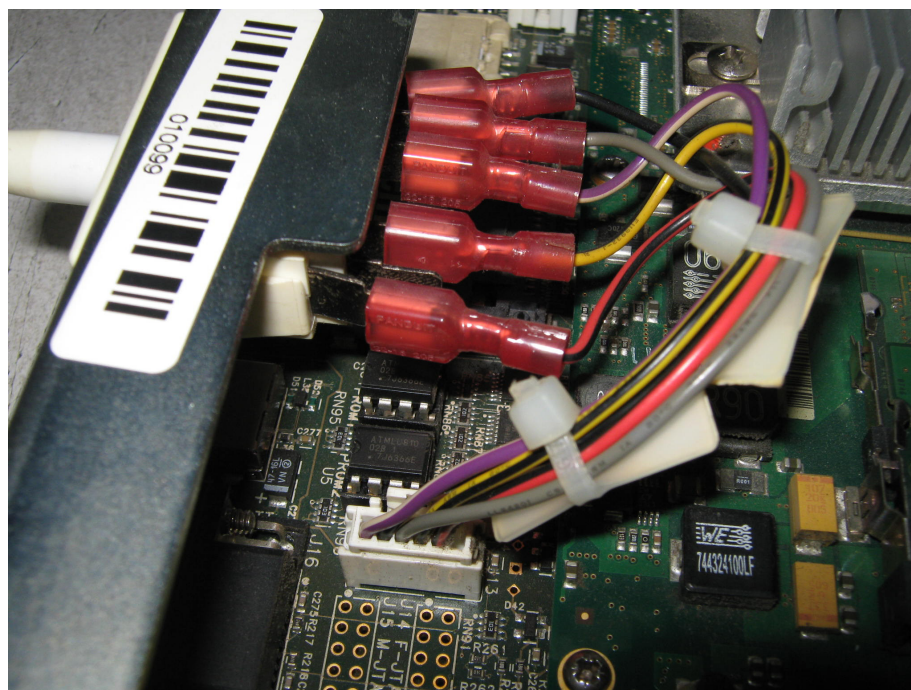
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'88' was alluding that the Carrier Board was being held in Reset and a solution would be to have the board replaced. Help! Board replacement is the last thing to carry out, especially since I didn't have a new board available. It made a great deal of sense to first try and RAM RESET the machine. Clearing the RAM is an easy and straightforward job, and it only involves swapping over the two E-square chips located behind the logic door switch.

With my trusty little screwdriver, I levered both chips out very gently, after actually removing the logic door switch to have a better access, and changed them over. I assembled everything back as it was but didn't turn on the machine before I timed-out for a smoke. 'Half Full' echoed in my mind but 'Half Empty' was also being heard remotely in the distance. It was now or never so I summoned up enough courage to put my finger on the RED PSU switch, eyes fixed on the 7-segment display, fingers crossed on the other hand and holding my breath in the meantime. '88' showed up again! Aaarrghhhhh! The board had actually died. It had served us well and brought many-a-smile to so many people but alas, all good things must come to an end. It finally went to meet its maker. Goodbye little board and may you



Fig. 10 and Fig. 11 – The E-squared chips behind the logic door switch



rest in peace. Another board was eventually installed in the machine and all was well again. The sun was shining a warm glow, the birds were singing in the trees and love was in the air, up until the point when I was called over to the machine a few days later, only to find the same

client beating the blazes out of it once more. Heaven help me and the machine, here we go again!

- James Borg  
jborg@slot-techs.com





## Safe Soldering for the Slot Technician

More Soldering Tips From Chip Quik

By Marv Cohen

Slot Technicians are constantly faced with changes in circuit board technology. The soldering methods of the past are not acceptable with today's state of the art technology. The new PCBs are heavily populated with surface mount components that are densely spaced on multilayer boards. The potential of inflicting damage has increased to the point where many technicians will not even attempt a repair. The challenge is to develop new solder/desolder skills by implementing safe affordable methods so repairs can become a reality.

### Soldering Irons

The most important requirement for today's rework is a modern temperature controlled soldering iron. This iron has a sensor in the tip that constantly monitors and accurately maintains a set

temperature. When the solder iron tip is inserted into the joint to be soldered (thermal load), the set temperature will not change. The main advantage is total thermal delivery at a constant temperature. The most efficient method of heat transfer is by direct contact as done with a solder iron. The advantage is creating quality solder joint at a safe lower temperature.



Use a temperature-controlled soldering iron that goes to sleep if not in use.

### Don't Use That Old Obsolete Soldering Iron

The disadvantage to using the old traditional iron is the wide temperature swings and long heat recovery time. This can be damaging to the pads, the chip, and adjacent

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components. When the iron is placed into the solder joint the temperature of the iron drops below the melting temperature and slowly recovers. During this transition, the heat is spread to undesirable areas. The result is a poor quality solder joint accompanied by adjacent damage.

### A Quality Solder Iron with the Correct Tip Will Make the Difference

Now that I have convinced you to use only a temperature controlled iron, it is time to talk about the soldering tip. In order to transfer maximum heat to the solder joint, the tip must be clean and properly tinned. Also lead-free PCBs use solder that melts at approximately 60 degrees higher in temperature than leaded PCBs. In order to enhance wetting, we need to use a more active flux for lead-free soldering. The combination of an active flux and a higher temperature takes its toll on the tip. The best way to prevent premature tip failure is to work with as low a temperature as possible. Also, many soldering irons have a sleep position that reduces the temperature about 50% when the iron is placed into the holder and instantly recovers to the set temperature once removed. To sum it up I recommend:



- Using a temperature controlled iron
- A low temperature sleep function to extend tip life
- Using the lowest temperature possible for a quality solder joint
- Always keep the solder tip well tinned and clean
- Selecting a solder tip for the best heat transfer

*Editor's Note: If not contrary to regulations, I recommend normal, leaded solder for repair work. I use Sn60 or Sn63. Honestly, I cannot tell the difference in general, although Sn63 seems a bit better for small SMD components as it*

*seems to cool and harden faster.*

### How Do I Safely Remove the SMD from the PCB with Chip Quik?

The Chip Quik SMD removal kit revolutionized the hand soldering industry many years ago. It is a fast, safe, easy, inexpensive method of removing a SMD from a PCB board. Hopefully you have been using this product but for those of you who have not, I will go beyond the four simple steps included with the product. I will explain the procedure in full detail.





## Chip Quik SMD Removal Instructions

First, apply tack flux to all the pins of the SMD to be removed. Flux is important because it removes oxidation and enhances wetting. Second, use a temperature controlled soldering iron set at 500 to 600 deg. F with a flat chisel tip. Choose a tip size that will provide the best heat transfer to the SMD leads. With the soldering iron, melt the Chip Quik low temperature removal alloy (melts at 136deg. F) along each side of SMD. Continue running the iron along the pins until a bead is formed all around the chip.

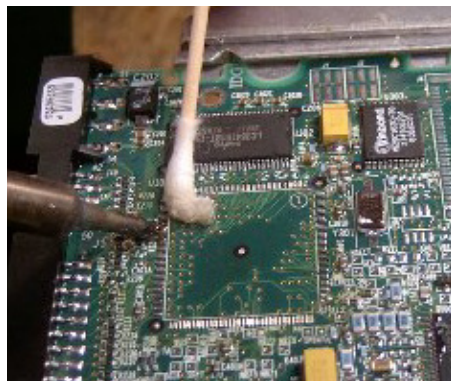
Maintain this alloy in a molten state long enough to combine with the interconnect solder (melts at 361deg. F) between the pins and the pads. Once the applied Chip Quik removal alloy mixes with the interconnect solder, we now have a resultant alloy with a low melting temperature below 200deg. F. At this new melting temperature, the pin pad connections stay in a molten state long enough to easily remove the SMD.

## SMD Pad Cleanup

It is of the utmost importance to thoroughly clean all of the pads prior to installing the new SMD. All remaining alloy should be removed from the pads in order not to allow any foreign material to remain.

This will insure the integrity of the new solder joint.

To clean pads, run a soldering iron with a wide tip along all pads while polishing them with a swab dipped in tack flux. This procedure will do an excellent cleaning job. I do not recommend solder braid



because in this application a higher temperature is required while applying pressure to the pads. This will increase the risk of lifting a pad. Clean up the remaining residue with isopropyl alcohol. You are now ready to solder on the new SMD.

## How to Solder the SMD to the Circuit Board

Now that you have all of my recommendations, you are ready to make quality solder joints. Before starting, it is important that the PCB pads are clean and the solder height

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on each adjacent pad is equal (co-planarity). Now apply tack flux generously on all the pads. The tack flux will improve solder wetting and also keep the SMD from moving. Place the SMD on the board using good lighting and magnification to insure the leads are centered on the pads on all sides. Carefully hold the SMD in place with a pick or tweezers. With a clean, tinned tip, carefully solder in three to four spaced apart locations so the chip will not move. At this point check the SMD placement for accuracy. Now apply solder to the tip and slowly drag solder along the pins applying more solder and flux as needed. You will find that the solder will wick into each pin pad connection to form a perfect solder joint.

If a solder bridge is formed, it can easily be removed with solder braid or flux.

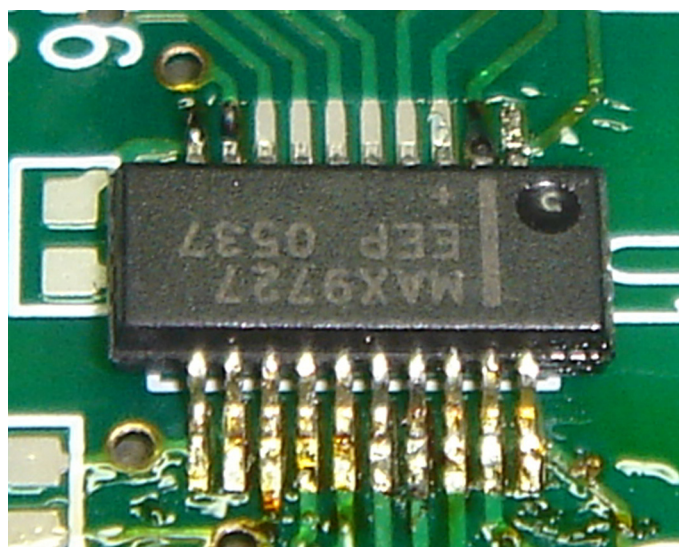
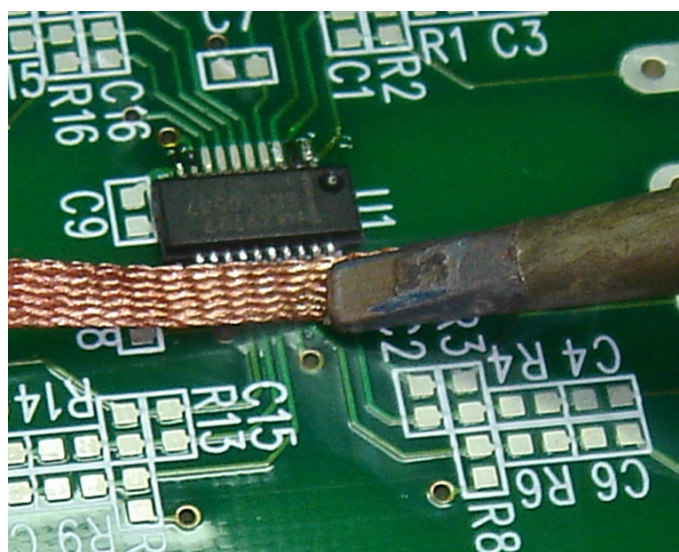
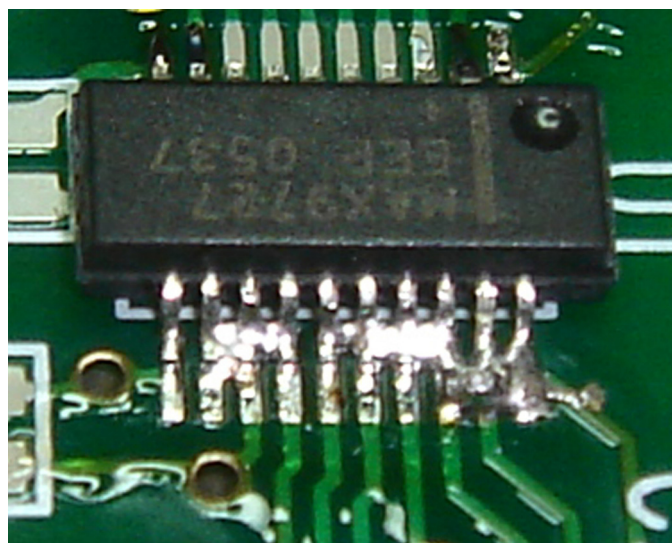
Clean completed solder joints with an acid brush and a good flux remover. Inspect all solder joints for any hidden defects.

Once you have perfected this basic soldering technique, you can try other similar methods and decide which works best for you. I will mention a few:

- Different solder tips for different applications
- Different types of solder wire or solder paste
- Use bottom of PCB preheat with a hot air pencil on top of PCB
- Use hot air in some applications
- Use different solder iron temperatures
- Use different tools: Vac Pens, Picks, tweezers, forceps, hold down tape, heat shield tape (Kapton), lighting, magnification
- Use a re-flow oven

Happy Rework!

Marv Cohen  
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## Quick & Simple Repairs #82

By Pat Porath



### Atronic e-motion "Heap Invalid Size" Error

As I arrived for my shift, a co-worker was telling me about an e-motion game that wouldn't boot up. After the count team went through

and changed the cash box, both of the upper and lower screens on the game went black. After that, the game would not boot up all the way. It would start booting, such as checking RAM, and the media CD, but after a few minutes a "heap invalid size" error appeared and that was it.

I started off by reseating both the COM board and main processor board. Then, I reseated the chips on the processor board. After that, I looked for any loose connections and one was found near the bottom of the game on a small square board. I thought I



had found the problem, only to find the error once again after another reboot. I made a couple of phone calls to see what the error even was. It is similar to a RAM error and I was directed to swap boards with a game nearby of the same theme. The problem did follow the board. Now it was time to either replace the main board or try a RAM clear. It was decided to go

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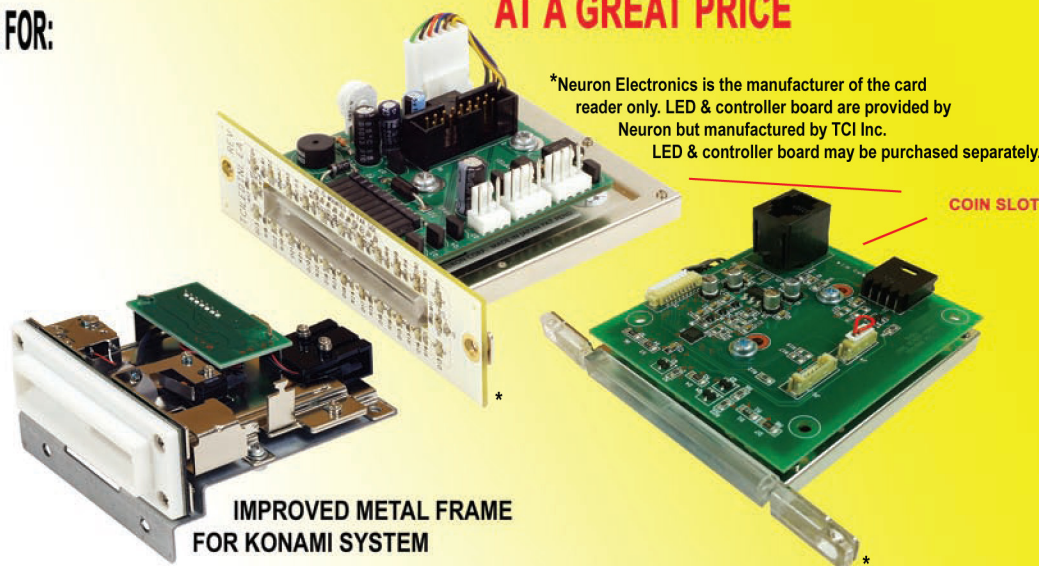
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with a RAM clear. After the clear and the options were set, the game was tested to make sure everything worked as it should. "Promo cash" downloaded properly, I had communication with the Oasis system, it took a bill but it wouldn't take a ticket. I tried a different one and it wouldn't accept that one either. Bill acceptors were swapped, now it looked like the problem was within the game. What did I do wrong?

Upon checking all the game options, I found what I had missed. "Voucher Redemption" was DISABLED instead of ENABLED. Luckily I could reset the voucher option without doing another RAM clear. The option was now set properly and a ticket was tested. This time the game accepted a ticket on the first try. Finally the game was working properly.

Editor's Note: Once again, this demonstrates that attention to detail on configuration is so important to the job of being a professional slot tech. You can be the greatest troubleshooter in the world but if you're sloppy with machine configuration (and there is a TON of it) then the casino can suffer.

### WMS Bluebird Reel Tilt

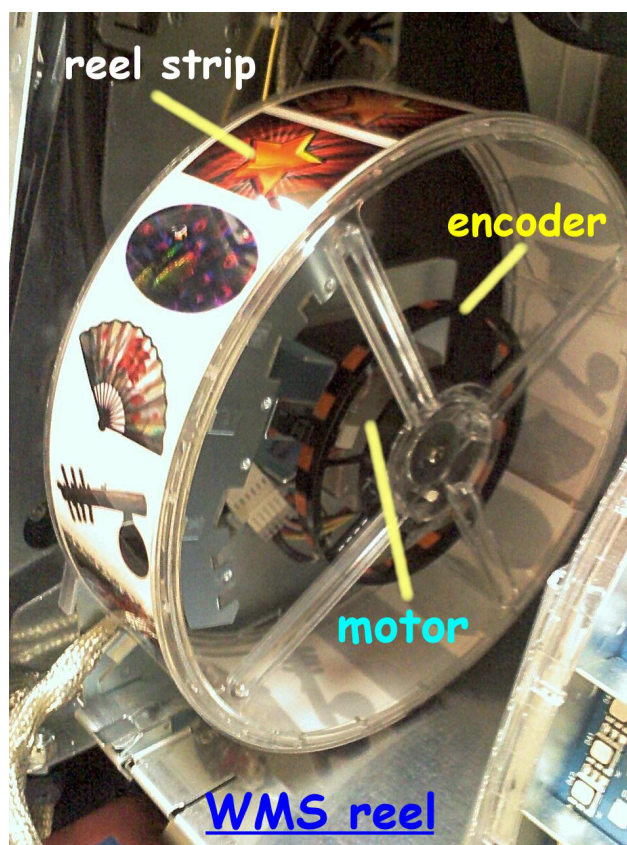
I was called to a WMS Bluebird reel game in which a reel tilt wouldn't clear. I checked connections on the reel control board (it's lo-

cated under the reels) and tried a reboot of the game. After a few spins or so, the game would go into a reel tilt once again. Since the error was displaying a "reel 1 tilt" I removed it for further inspection. The reel motor felt OK when manually spun, it didn't make any weird noises or anything, and the reel itself wasn't loose. When I took a closer look, I found the problem. The "reel encoder film" was partially out of the reel basket groove so when the reel spun, the encoder optic couldn't tell what position the reel was in, therefore, a tilt would occur. Very carefully, the "reel film" was put nice and snug in place where it should be and the reel assembly was put back into the game.

After power was turned back on and the game finished booting up, the customer continued to play without any tilts. This was my first time seeing a loose encoder film on a Bluebird, I've seen dusty ones on older Konami games that caused tilts. Simply clean it with a dry Q-tip and no more reel tilts.

### IGT AVP 3.0 Conversion, Reboot Problem

While doing conversions on a bank of slant top IGT AVP 3.0s, there was a game whose screen would freeze after a few minutes of being turned on. The game would freeze up and nothing (such





as the touch screen, the test button or player buttons) would work. Since two boot chips were freshly installed, maybe one of them had a bent leg and wasn't making a very good connection. After the brain box was removed, the chips were inspected but both looked perfectly fine. Just for the heck of it, I checked the cooling fan on the video card. It would hardly spin at all. A spare was installed, now after a little while the game would reboot itself. Maybe the power supply was weak? That was replaced too but still the game would reboot every so often. As we later found out, the replacement fan on the video card was weak because when the brain box was removed, the area around the fan was very hot. A second replacement video card was installed and for the remainder of the shift, the game was fine. Another thing that was done during the conversions was that all of the brain boxes were taken outside and blown out with compressed air. They had a lot of dust buildup in them and it was a perfect time to do a bit of preventive maintenance on the games.

### IGT AVP "SAS Communication Down" Problem

I was asked to look at an AVP 3.0 that didn't want to communicate with our Oasis system. I tried all kinds of different things to try to find the problem. It

seemed no matter what I did, the SAS error would not clear. The IGT COM board was tried in different channels (sockets, a total of four), a replacement COM board was installed, different software channels and addresses were tried, the brain box was reseated, the COM cable connections were checked at the COM board and at the Sentinel, even the Sentinel was rebooted. Nothing seemed to work. The best I could come up with was a red light blinking on the board which meant the game "sees" the board but there wasn't any communication. Game software options were checked and rechecked, SAS was enabled, address 1, COM board RS232 en-

abled, and so on. A co-worker told me to check all of the connections on the game power supply. They looked OK. I also checked connections on the backplane board, everything looked OK. What was I missing? A co-worker looked at the game and found one of the 120 VAC connectors from the power supply had come loose. As soon as the connector was plugged in, the SAS error disappeared. The connector was for a progressive board. Finally the game was back online.

*Editor's Note: Hey, Pat. Do you need a brighter flashlight?*

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## IGT AVP G20 3.5 Printer Problem

We recently installed 42, IGT AVP G20 3.5s and had a few Ithaca 950 printer problems. Taking a quick look at it, everything looked OK. None of the printer optics appeared to be blocked and a few door resets were tried, still the error remained. Since the error was a printer communication error, I thought I would try swapping around the USB connectors to different ports. I have done this a couple of times in the past and it has worked. After swapping, the main door was closed, then the error was cleared. It seems like I heard or read somewhere that a USB port may “fall asleep” (not work) and after reseating or trying a different port, it will work again.

## IGT Game King Problem From Bad to Worse

I received a call from a slot attendant that the top row of buttons wasn't working on an IGT Game King. Most of the time, one of the I/O cards are loose and in this case, this one was too. I turned off the game to snug the card back in place and when I turned the game on, the LCD was totally black; not even the power light on the bottom was lit up. Now what? I swapped the possible bad LCD with a game next door just to make sure and it did in fact die. From what I thought would be a

quick easy fix, now I had to go to the shop and grab a spare. After it was installed, the game was back online. One way to tell if the LCD is bad is to simply swap it with the one next door.

Usually they are very easy to remove and install. If the LCD does work in the game next door, then you may have a processor board, video card, or power supply problem. With the I/O card snug in place and a replacement LCD installed, the game was ready for play.

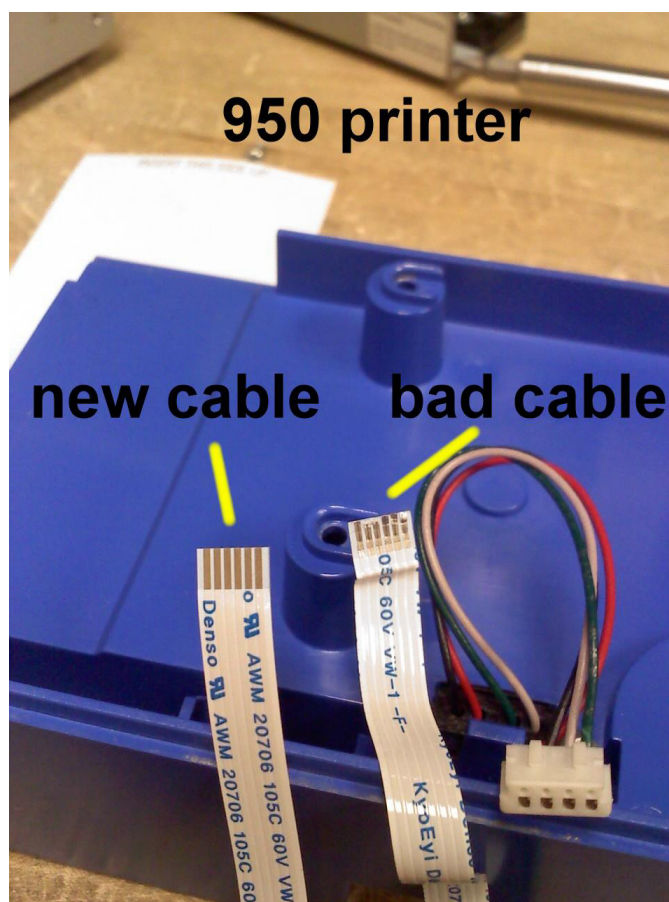
## Ithaca 950 Ribbon Cable Problem

While troubleshooting some Ithaca 950s on the bench, I applied power to one of them and the “ready light” didn't light up. The printer did do a self-test cycle and it fed paper OK, but why wasn't the light lit? It looked like it didn't have power, even though it did. Upon further inspection I found a possible bad ribbon cable on the paper tray. After the cable was replaced with a new one, it lit up per-

fectly. The reason the cable didn't work is probably from numerous times of swapping paper trays with different printers while troubleshooting printer boards and print heads.

## Aristocrat Viridian Slant Top Video Problem

In our log book, it showed an Aristocrat Viridian slant top game had a video problem. It was also written, after a reboot 15 minutes later both the top and lower LCD would scramble. To me it sounded like a heat issue. Maybe the fan on the game processor or the video card fan wasn't working. Upon arrival at the game both fans were checked and they appeared to be good. With game power off of course, I





reseated the “smart card”, the game CF card, along with reseating the main processor board. Power was turned on to the game and it started up normally, text was scrolling on the screen. After it was completely booted up the game was fine, no video problems at all. Not after 15 minutes and not after five hours. While talking to a tech on the next shift, the individual stated that a loose ribbon cable was found behind the main processor board near the end of their shift yesterday and the game wasn’t turned on after that. In a lot of cases with video problem in games, I look at the video card cooling fan. On an IGT AVP such as a “Trimline,” if the game graphics start to scramble a little bit, there is a good chance the video card needs to be replaced. On a Bally Cinevision game,

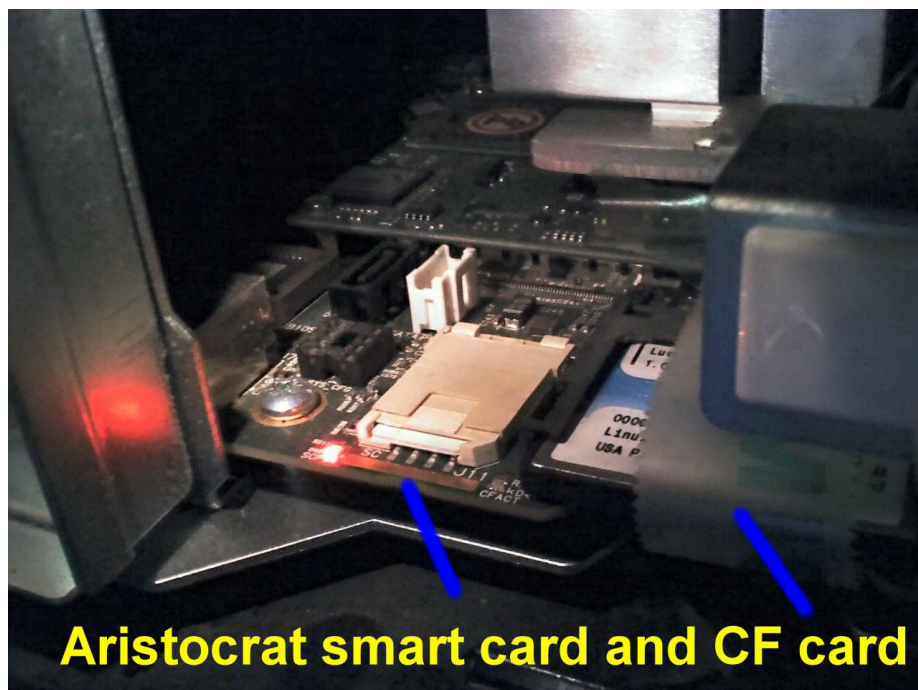
if the graphics scramble I would say the cooling fans located above the LCD need to be checked and/or the LCD needs to be replaced.

### **Older IGT Video Game That Wouldn't Cash Out Credits**

This IGT (manufactured in June of 2001) wouldn't cash out the credits. The game would play, accept bills and tickets and was communicating with our Oasis system but would not cash out the credits and it didn't even display any kind of tilt. It almost acted like the credits were “promo cash” in which the credits are not allowed to be cashed out. But the game and Oasis options were checked, rechecked, then checked by other techs. From what I was told and what was done on our shift, darn near everything was swapped or replaced along

with at least three, e-square chip clears and game RAM clears. The original problem was a “coin-in tilt” and “meter disconnected” tilt that wouldn't clear. After cleaning the coin in optics, swapping all three of the I/O cards, the power supply and the main processor board, both errors cleared. Then the cash-out problem occurred after the main board was replaced. I was told a different board was put in the game and the problem still existed. The ticket printer was swapped, the Sentinel board and SMI board was replaced. Even the game interface cable was replaced. It did not make any logical sense at all as to why the game would not cash out the credits. We had games of similar software in the bank, but not exact, so a few of the game options were different. As a co-worker found out, the repair didn't make much sense either. The tech stated that the “coinless mode” option needed to be set to “disable.” Even though it was a totally coinless game, the option needed to be set as such. In other words “coinless mode” was set to OFF in order for the credits to cash out. Kind of crazy isn't it? After the option was set, credits would cash out as normal.

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[pporath@slot-techs.com](mailto:pporath@slot-techs.com)



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**"I can help you bring down the cost of casino electronics repairs"**

Randy Fromm



# Buying Replacement Units!

Is your casino totally self-sufficient in repairing monitors, power supplies, bill validators and ticket printers or are you throwing away hundreds or thousands of dollars purchasing replacement units? While it is not exactly a "hidden" cost to your department, some slot managers simply accept the price of replacements as the "cost of doing business" while it progressively nibbles away at the casino's bottom line. **IT DOESN'T HAVE TO BE THIS WAY.**



"OK. You asked and I listened. My new tech class eliminates obsolete CRT monitor repair and the associated monitor repair lab. In just four or five days, your slot techs can learn to repair Power Supplies, LCD Monitors, Ticket Printers, Bill Validators and more. It's easy and it's fun." - Randy Fromm



In truth, most electronic repairs are pretty easy. Often, it's just a matter of testing and replacing a small handful of inexpensive, off-the-shelf electronic components. Sometimes, it's just one. For example, it costs less than 25 cents in parts to repair the most common failure in Bally power supplies. The entire process takes about five minutes.

## LET ME SHOW YOUR SLOT TECHS THE QUICK AND EASY WAYS TO REPAIR CASINO ELECTRONICS

You will see an immediate savings to the casino, starting with the in-house repairs that will be performed during the class!



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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# Add some CELEBRATION & EXCITEMENT to your casino floor!

## CELEBRATION VIDEO TOPPER

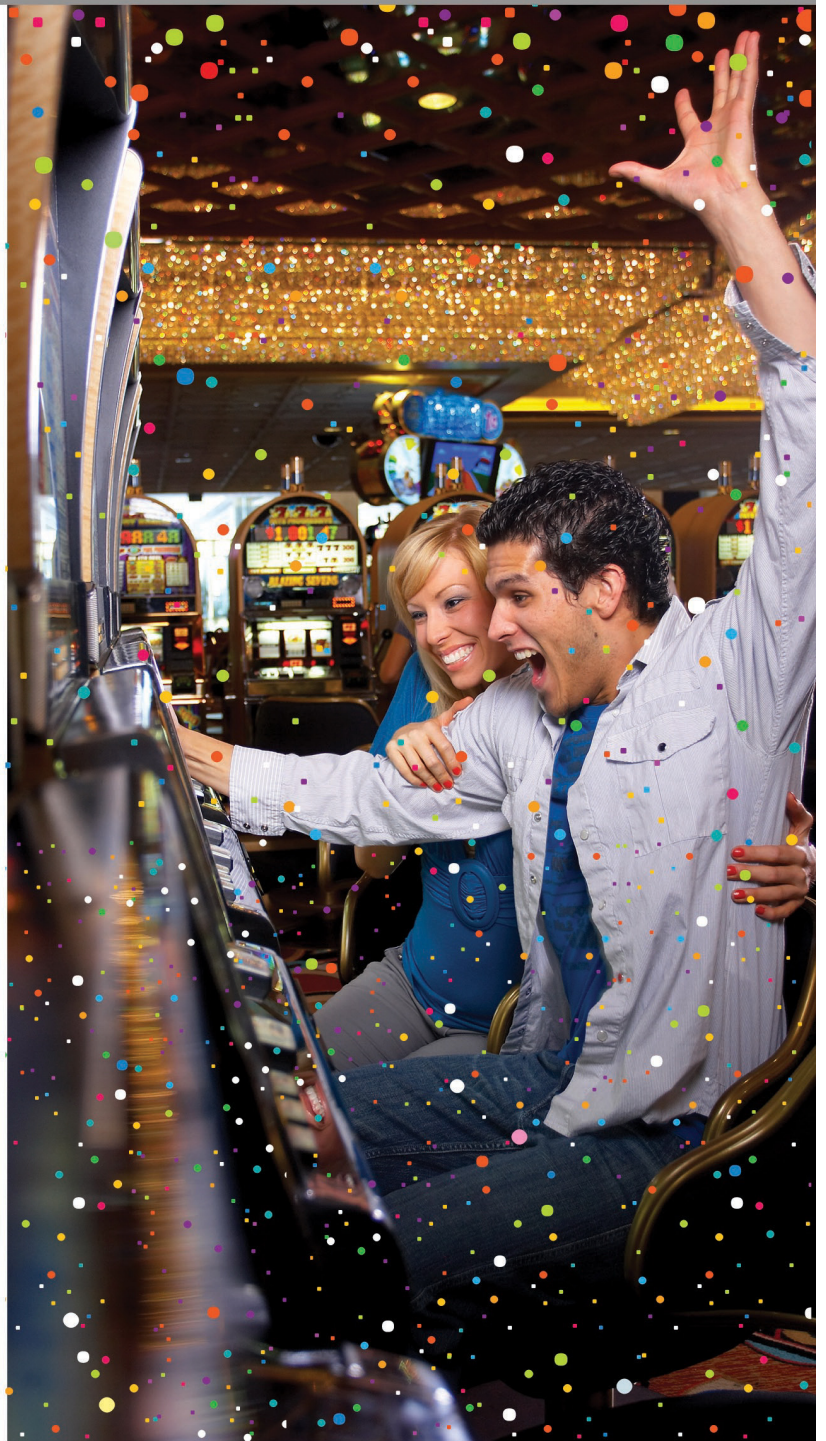


This innovative topper design creates a new level of excitement on your casino floor and stimulates additional game play!

Topper interfaces into the SAS line to detect a hand pay signal from the slot machine and triggers a "Celebration Event" including ANY or ALL of the following:

- Confetti launcher throws out bursts of confetti
- Loud celebration alarms or music through built-in speakers
- Standard or customizable videos on 15.6" LCD
- Flashing multi-color RGB LEDs on both sides of LED
- Event Modules that raise and lower event attraction modules, such as LED tubes, flashers, etc.

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