

September 2009

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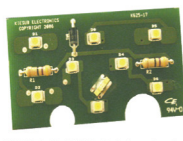
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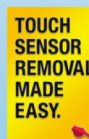
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September 2009

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Dear Friends of Slot Tech Magazine,

I am sorry to have to report a great loss to the gaming industry's technical community. No, he's not dead (yet) but Ted Befus has moved to the Saskatchewan telephone company. I had always looked forward to reading Ted's articles and I have learned a lot from reading about his experiences. Thanks, brother. Good luck to you.

On a happier note, congratulations to Kiesub Electronics having been awarded the prestigious 2009 Green Award by the Las Vegas Business Press in the category of "Best Green Product Practices" for their LED replacement panels for slot machines. These panels were designed by Kiesub to replace the incandescent and fluorescent bulbs in slot machines with energy-efficient LEDs. Casinos are saving thousands of dollars each year in energy costs by installing these boards in their machines, reducing power consumption up to 80%. Way to go, Kiesub.



Malta's James Borg has another interesting monitor repair for us. This time, it's a marathon as he and his mate Mario, tackle a digital monitor with a cratered PCB and a host of other "issues." This is a good example for those of you without a lot of monitor repair experience, that sometimes you must be patient in your repairs. There may be numerous issues in the monitor AND/OR not all monitors can be repaired simply by replacing bad electrolytic capacitors.

Finally, I have planned a five-day, regional Slot Tech training class for the week of October 12-16 2009 at Mole Lake Casino in northern Wisconsin. I have 13 spaces available for the class, first-come, first-served. See the website at slot-techs.com for details and an enrollment form or give me a call at 619.593.6131.

Randy Fromm

Randy Fromm - Publisher

Printed back issues are available for only one year from the date of publication. All single issues of Slot Tech Magazine are \$10.00/ea. For further details on the contents of each issue, please refer to the website at slot-techs.com. To order, fax a PO or e-mail a note listing the issues you need.

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Randy Fromm

Randy Fromm's

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- 8480- Single RAW cold cathode lamp for 10 inch LCD monitor in IGT games
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It was quite a long week and the last thing you want on a Friday, just hours before you call it, is to be presented with a monitor which, by the looks of things, seems to have either caught fire or was on the verge of doing so. It can be pretty awkward working your way around cremated or carbonized parts and tracing the remains is no easy task by far.

Fortunately enough, I had a similar monitor at hand, a Wells Gardner PD189300. That would at least assist me greatly to find out where the tracks were. By the looks of it, I think I might be in need of some prayers to tackle this baby.

The area around the cremated section pointed to Q318 (IRF640) which was right next to ZD301 (Z18B). Both of these components were destroyed.

A peek at the service manual gave me the following information about this part of the circuit. The components involved are related to changes in the

A Hole in One

By James Borg

resolution of the monitor. They are the “S-Correction capacitor switches.”

Editor’s note: The operation of this circuit was also covered in Slot Tech Magazine’s eight-part series “Introduction to Digital Monitors – Part 7” September 2005.

Q316 is off when horizontal frequency is 35KHz.
Q316, Q317 are off when horizontal frequency is 37KHz.
Q316, Q318 are off when horizontal frequency is 43KHz ~ 52KHz.

Q317, Q318 are off when horizontal frequency is 53KHz ~ 61KHz.

Q316, Q317, Q318 are off when horizontal frequency is 62KHz ~ 70KHz.

Fig. 2 Top View of Q318 (about to drop off)

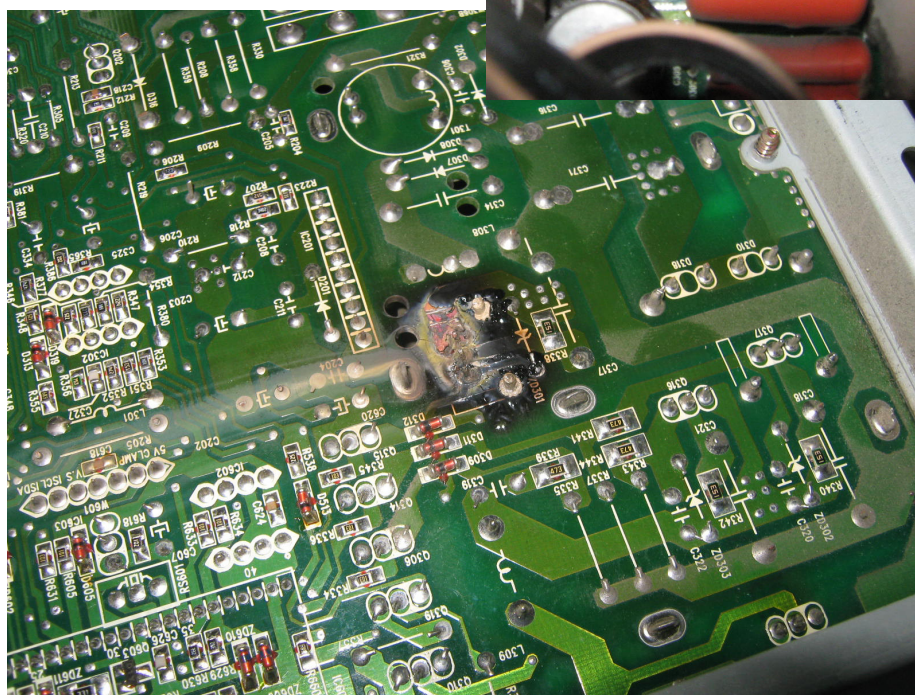
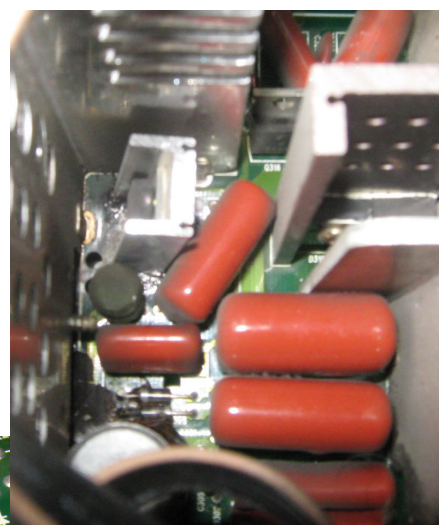


Fig. 1 Cremated Tracks



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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Having found the damaged area on the schematic, it was high time to pull out the offending articles from the printed circuit board. That was going to be easier said than done, reason being that the board, along with the component legs and the solder, had all been cooked nicely and the solder would not flow enough to be sucked off the tracks. I'll rephrase that, what's remained of the tracks.

One of the problems that crops up when a printed circuit board is carbonized is that the carbon has to be removed, the reason being that it's conductive. It's quite a nuisance when this happens to be in the middle of a high voltage circuit and I've experienced many strange faults arising from such situations. The effect can be more appreci-

With that nice gaping hole present where before tracks used to be, was going to prove somewhat difficult to insert the new IRF640. The only way to do it was to fit the component somewhere safe, and have wires leading to where it should have been on the print.

It was time to do the deed. Will it go up in smoke again? Will the whole thing explode? Will we be witnesses to another hole

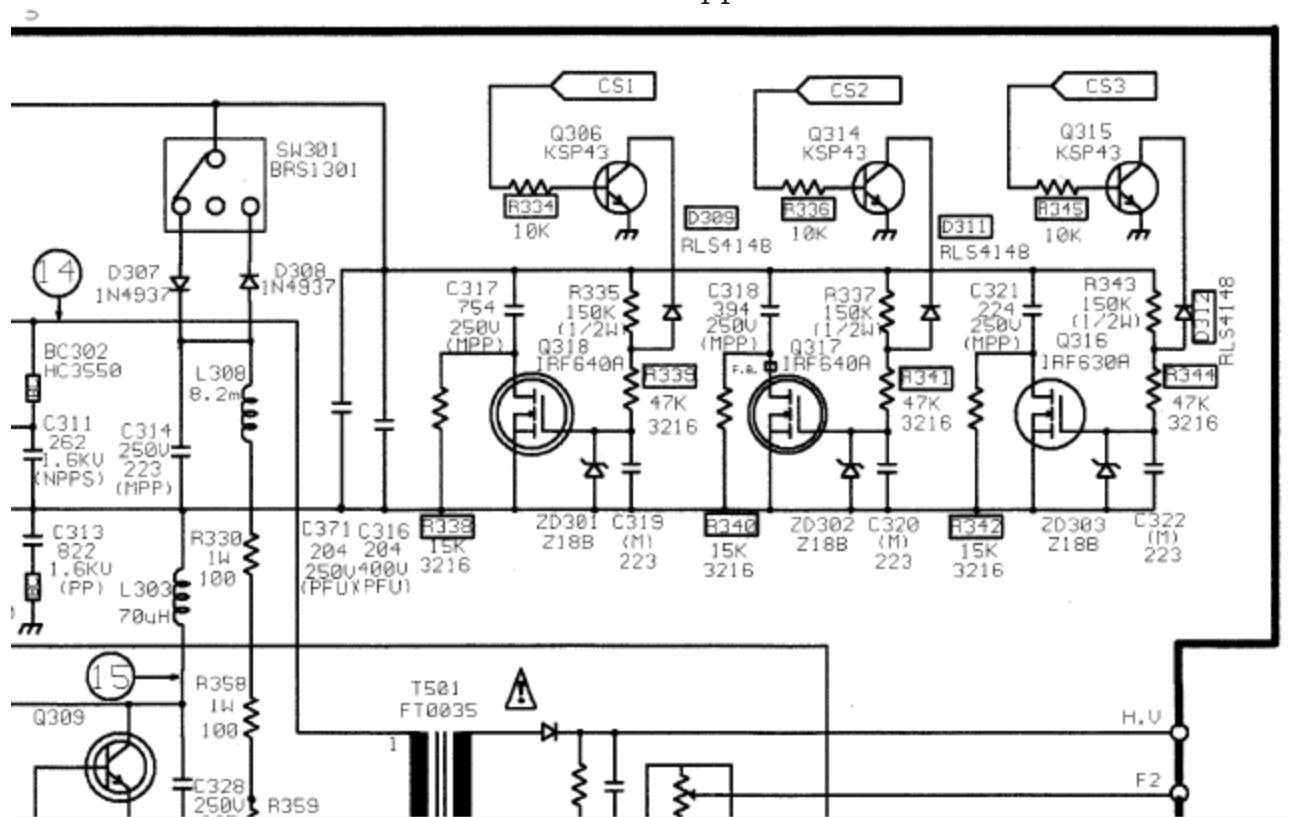


Fig 3. Q318 and ZD301 Circuit

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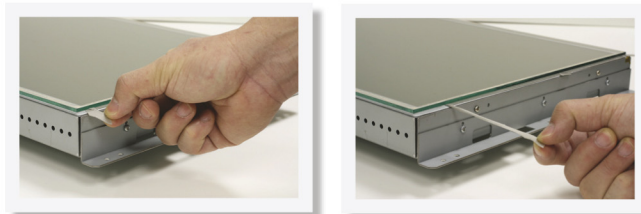
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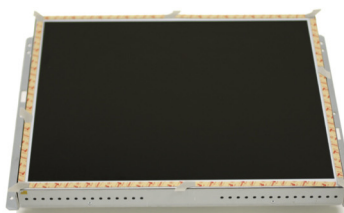
1 Pull Tab at 90 Degrees

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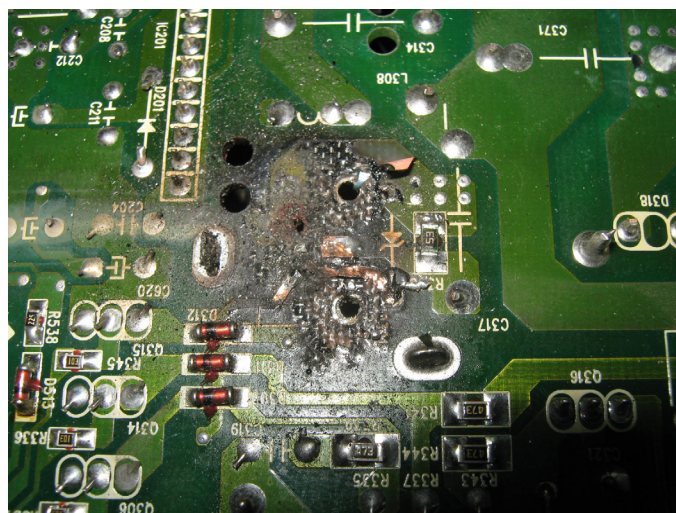
being born? Will nothing happen? Will we get the champagne out? So many questions...but the best way to answer all those in one go would be to apply juice to it and hope for the best. Seconds always seem like hours in such a situation but thank the stars that the high tension crackling built up nicely and the picture was as it was hoped for. That was good news indeed as a burn on a printed circuit board isn't something healthy at all. At times it can be so bad that the whole board needs to be scrapped. This time, the board was lucky and so was I.

Everything was looking good, if not brilliant so it was time to celebrate with a drink of iced tea and a smoke since we were out of champagne. It's great when a job works out wonderfully and without way too much hassle. The best thing to do now was to leave the unit working happily alone and carry on with something else, just in case it decides to fail (Shock. Horror.).

My mate, Mario, on passing by after a few minutes said "Hey, the picture's gone wide. Did you touch it?"

I thought he was having me on so I didn't take a great deal of notice initially as I was 'busy' watching "Back to the Future" and still feeling good that the monitor was repaired but on going round to have a look...SHOCK HORROR! He wasn't telling porkies, the picture had indeed become wide, too wide for comfort. I decided to turn it off for a few moments to see if it is heat related and take it from there.

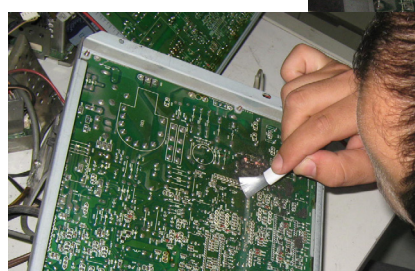
A few moments later, the juice was applied to it again and the picture was fine but only for a couple of minutes at the most. It started getting wider, slowly but surely. Crap! I turned it off again and let it cool down one more time. On turning it back on, the same thing happened. It started off with a properly sized picture but after a while, it started to get wider. No fear as I still had nearly a full can of freezer spray



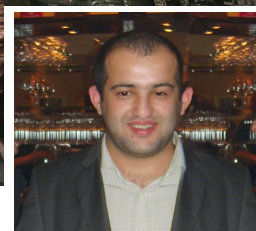
Disappearing Tracks



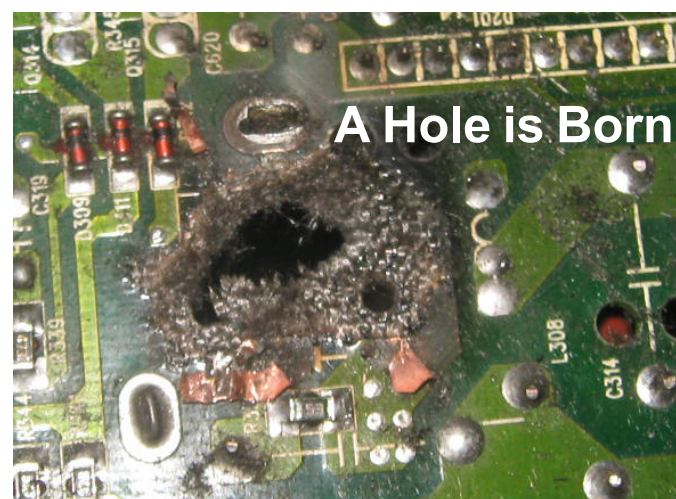
Mario in Action



Removing the Carbon

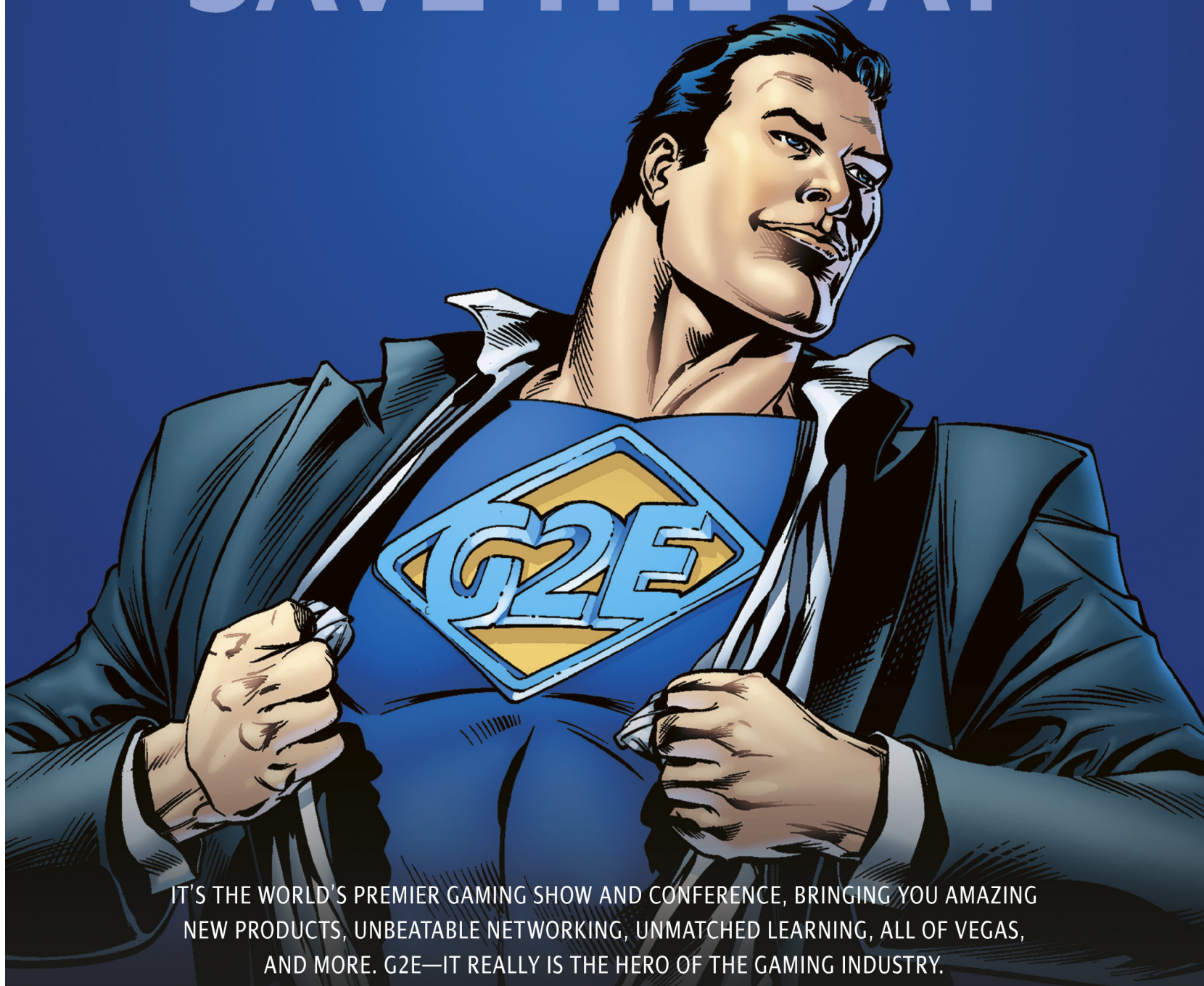


A better photo of Mario!



A Hole is Born

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handy. Spraying here and there around the high tension circuitry didn't seem to make much difference. Then all of a sudden, the picture jittered, and shrank to its proper size while the brightness increased, as if the G2 was adjusted by a couple of degrees. Every so often, it jittered slightly and there was also a difference in brightness but it remained constant, at least for a few minutes. The last couple of areas that were cooled down were the little daughter board (D/F board) mounted on a heatsink right on top of the vertical driver chip and a diode D316 (S3L60) which was next to the vertical driver chip.

The funny thing about it was that several attempts afterwards to simulate the same thing didn't have any effect at all. Weird but true. The cooling of the D/F board and the diode D316 must have been flukes. At that rate, I was going to finish off the freezer spray in a jiffy (or perhaps two jiffies) so the freezer issue was put aside.

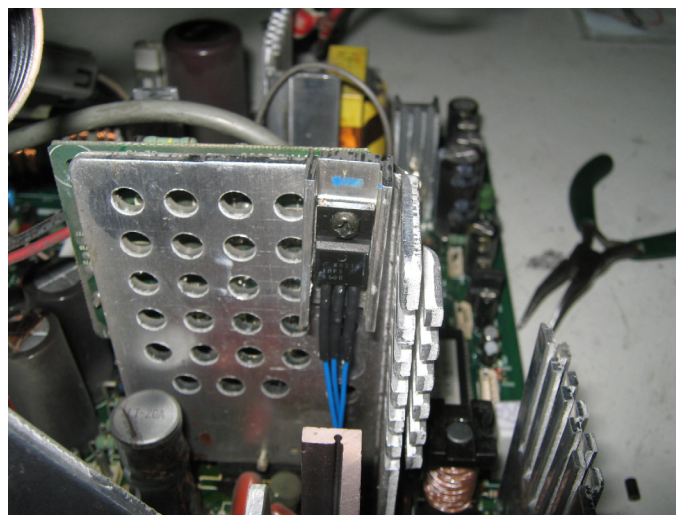
What could be causing the symptom? It did seem like some factor related to a component heating up but it certainly wasn't making much sense the way things were going, that's for sure. I decided to time out and watch some more of "Back to the Future" for some inspiration. As soon as the Flux Capacitor was mentioned, my left eyebrow was raised. What if a capacitor was causing this problem? It's a possibility not worth discarding at this stage, especially since I had nothing else going.

I still wasn't totally convinced as the hot and cold approach would normally catch the offending component but in this line of work, anything's possible. Visually, there were a couple of capacitors which were slightly, just slightly inflated. However, these were C202 and C206, both 2200uF/16v. The only snag about these was that these were filtering the positive and negative 12v on the frame chip. They were still pulled out once the board was out of place, which was just as well as it will save me

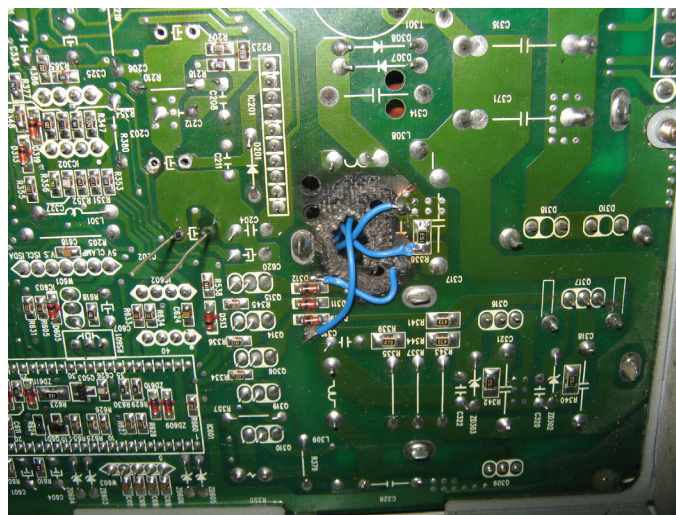
future hassle with a fault on the vertical section. Along the testing and rooting out procedure, two more capacitors, namely C331 and C370 (both 220uF/200v) were replaced. They were 98% there, but still



Top View of Hole



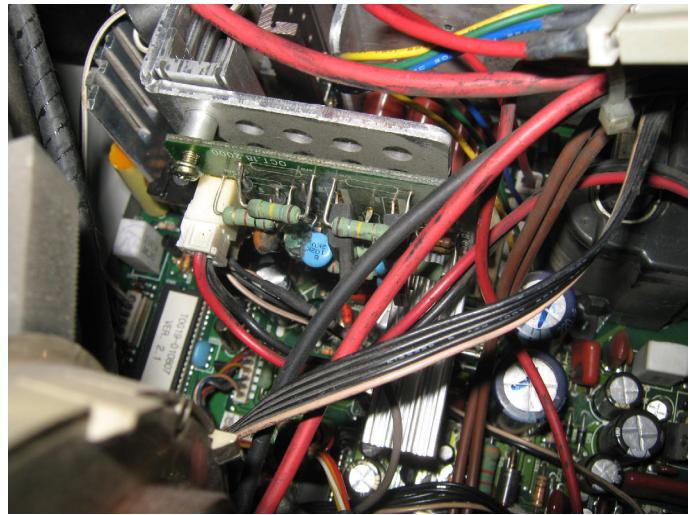
IRF 640 Mounted



Using Flying Leads as Track Replacements

replaced them just to make sure, since their location in the circuit was somewhat crucial. They are on the 55v supply rail, and they could easily have an effect on the picture size and even the brightness. I was basically clutching at straws but I my options were slowly running out with each component that I changed. I wasn't convinced about them at all but they were still worth changing. During the course of this operation, I noticed that there was glue, which had turned brown, all over the high tension and power supply circuits. From past experience, I had found that this offending article becomes slightly conductive and can create very weird side-effects. I didn't want to take any chances, so any glue found here was removed. It was plastered on quite a few components so it was a long and awkward process, but eventually, there wasn't a sign of the stuff anywhere else on that section of the board.

It was time to plug everything in and take it from there. Holding my breath and thinking what else it could be if the fault was still there. Once the board was in place, I was a bit hesitant to apply juice to



DF (Dynamic Focus) Board

it, so I decided to have a coffee and a smoke before doing the deed. If all that didn't work, I did have another option open, and that was to start working on the voltages. Problem was, that the way the board is fitted in the monitor's chassis, it wasn't going to be an easy task.

Juice was eventually applied, the few seconds before the high tension crackling was heard seemed like hours and then it happened. The crackling was heard. The picture was as steady as a rock and all was looking great. It was just a question of

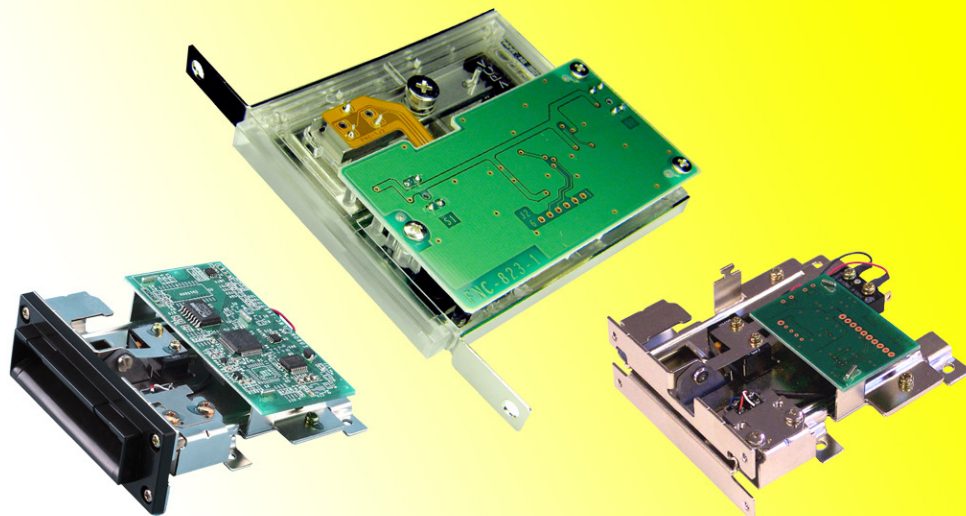
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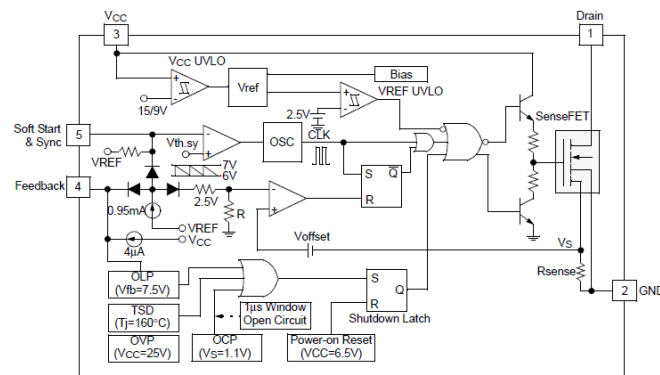
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plugged in, the fuse flashed immediately. That was not a good thing, not a good thing at all. Apparently it didn't even work for even a second. I ended up going through everything with a fine tooth comb to trace what could have caused the fuse to flash.

The fuse was replaced with another 3.15A but there was no way that the juice was going to be applied before I checked the power supply properly. There was also some more of the dreaded glue around the mains section which if removed, would be a positive thing. A good place to start would be across the bridge rectifier BD101 (D3SBA60). As it would have it, there was a short circuit across the positive and the negative terminals. That was a good start. I was praying that a couple of diodes within the bridge didn't feel like working anymore so the bridge was pulled out. I felt a cold shiver going up and down my spine as the bridge was fine and the short remained on the printed circuit board. Help! I checked IC101 (KA5S1265) and there was a nice juicy short between pins 1 and 2.

From the internal block diagram, the chopper transistor was shorted to ground. Ouch! I suddenly didn't feel very good any more and had to time out and calm down a bit. A short there isn't pleasant,

Internal Block Diagram



especially if it spreads out to the components around it. The monitor would be as good as dead or heavily wounded. However, the only thing that I found shorted (at least it seemed to be shorted) was diode D116 (RLS4148) which was connected to the chip on pin 5 via C111 (1uF/63v). I thought it was strange that this diode should blow since it was aptly protected, unless C111 was shorted out. Come to think of it,

even if C111 was to go short, there aren't any high voltages present there as pin 5 of the chip was only its Soft Start & Sync. On a closer physical inspection of the diode, I wasn't quite sure what its function was as both the anode and the cathode were on the same track. Hardly surprising it was giving me a short circuit so I left it as it was. Just to make absolutely sure, I had a similar working board which had the

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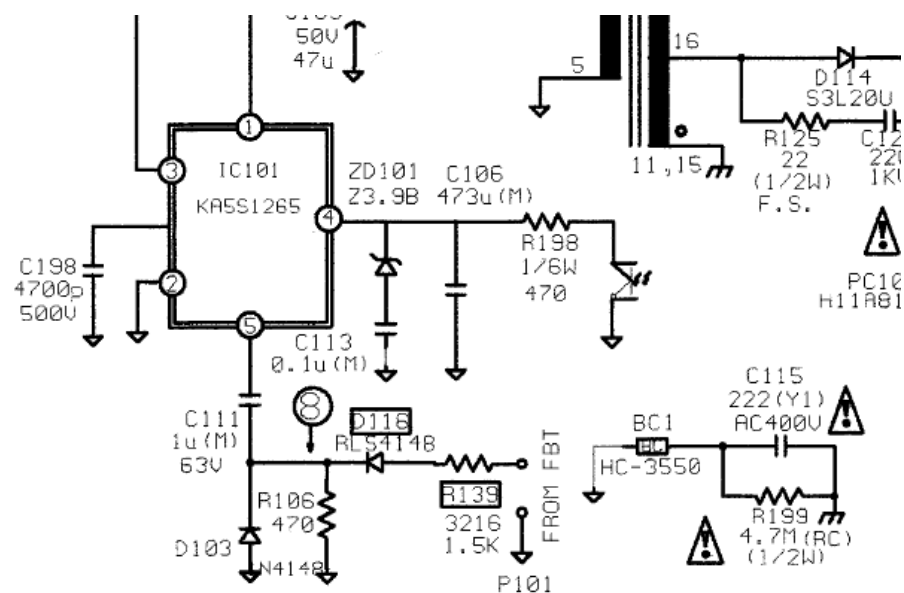
A new KA5S1265 was fitted in after the bridge rectifier and it was time to do the deed. Fingers crossed on their own weren't enough in this case as the mystery of the flashing fuse and the blown power switching chip still hovered above my head.

Looking at it and filling the room with smoke from my last ciggie, something sort of hit home. On the board, just about an inch away from each other, were two identical connectors. One was designated as W101, which was right next to the degaussing relay RL101, and the other one was designated as P101, which was right next to the power switching chip. W101 feeds the degaussing coil whilst P101 was a tapping from the high tension transformer for synchronization. Could it be...just

The monitor, happy again, was left on next to me under observation. Every now and again, switching it off and then back on again just for the kick of it. I'm sure my heart missed a beat when it suddenly, totally out of the blues...and when least expected, the picture went bad. It went wide again! This can't be happening. It's all a horrible nightmare which I'll wake up from and that would be that. However, it wasn't so and the screen was nice and wide, and looking at me. It was

It looks like I was back to square one and lost, totally and utterly lost. I really get upset when this sort of thing happens. It's fine having one fault. Two would be stretching it a bit. But three is way out of line, and stops being a joke. I had to concentrate on the original issue, where the cooked parts were. It just had to be something related to that...it just had to be. Going round the components in the area, namely around Q318, showed me some light at the end of the tunnel. It was about time too.

CS1, CS2 and CS3 were all at the correct levels as dictated by the manual for any particular mode selected. (Ref to Fig. 3) However, the collector on Q306 wasn't at the voltage level expected when com-



pared to the collectors of Q314 and Q315. A resistance check on this transistor made things a bit clearer. It was leaky! It was upsetting the mode selection process. It also upset me substantially. I'm not sure what made what go first. It could have been this leaky component which damaged Q318 and ZD301 causing their total destruction. It could have been a dry joint on Q318 itself. It could have been quite a few other factors which resulted in the board nearly catching fire. I guess I'll never know for sure. One thing I know however, is that the monitor is working fine and it's been like that for a few weeks now so I can safely add another notch to my rifle butt and wait for that monitor to make me meet my Waterloo. Until then, bring them on.

- James Borg
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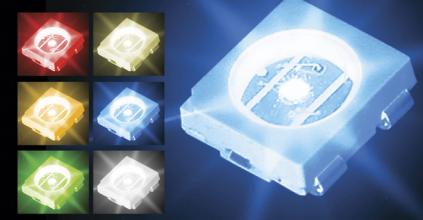
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From the Mail Bag

My buddy Chris, a tech at a casino in the Midwest, sent me an email with some questions regarding Sentinel IIIs and Promo Cash. To start off with, I will touch on the Sentinel III. Out of nearly 1400 games that we have at the casino I work at, around 20 games have the Sentinel III installed. They are based on the Sentinel II but are more advanced.

One of the features is an LCD display that has a touchscreen and keypad built in. The display is also capable of producing in-house advertising with the use of CF cards. One card is the version and the other can be loaded with pictures of the casino's restaurant, clubs or anything else. We currently aren't using it but the Sentinel III even has audio capability! As FIGURE A shows, you can see that all of the connections are clearly marked. Notice the audio connection?

Quick & Simple Repairs #53

By Pat Porath

FIGURE B shows what the display looks like when a floor card is inserted. Notice the touchscreen keypad? When we first installed these, I asked an Oasis tech how durable these were. He stated that they were very durable and stood up well. Thus far we haven't had any problems with ours and we have had some installed for about a year.

FIGURE C is a picture of the back of the Sentinel III display. There is only one cable that connects the display to the Sentinel III. Also pictured in the middle area are two speakers that are part of the Sentinel III.

Figure D is a picture of advertising for our Club Four One, which has live music Wednesday - Saturday and comedy night on Sundays. It is actually a photograph of the Club, transferred to a CF card and inserted into the Sentinel III. FIGURE E is a picture of what the display looks like when a floor card is inserted and the slot door is open.

As for Chris's question on Promo Cash, well, here goes. Promo Cash, as we call it at the casino where I work, is credits that can be downloaded from a player's card to the credit meter of the game. An example

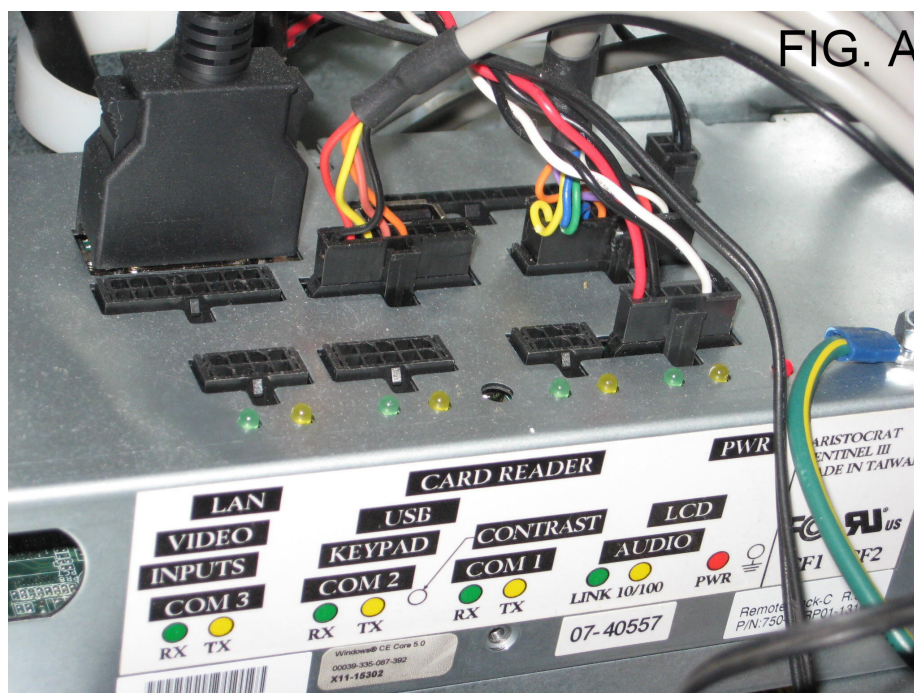


FIG. A

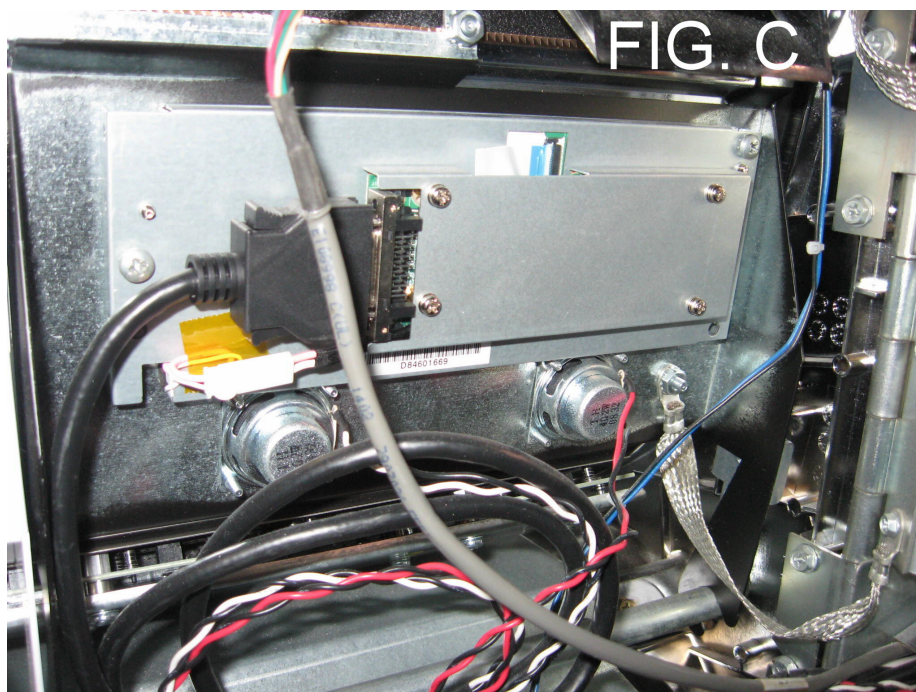
would be, a customer spends the night in a hotel room and receives \$20.00 in Promo Cash. The customer would walk up to a game that has a green "Promo Cash accepted" sticker on it and insert their card.

Next, they key-in their PIN number, followed by the number 2 for promo, then the number 1 for the credit to go to the game. Next, they enter the amount that they would like to download, say \$10.00. The customer would press the numbers 1 then 0 followed by the ENTER key. Presto! The game now has \$10.00 worth of credits in the credit meter.

If there is a problem during the download process, an error or error code will occur. Once Promo Cash is downloaded onto the game it CANNOT be cashed out. On some games it will show "promotional credits, unable to cashout." Of course, the customer can cash out what they won from the promo money. Some of customers cash out every time they win anything just to keep track what is left of promotional cash on the game. Other customers periodically cash out when playing promo to see what they have remaining. When it is introduced to your gaming floor be prepared to have employees ready to assist customers with downloading. We have instruction cards that can be passed out but some customers still need help.



FIGURE B shows what the display looks like when a floor card is inserted. Notice the touchscreen keypad?



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Figure D is a picture of advertising for our Club Four One, which has live music Wednesday - Saturday and comedy night on Sundays. It is actually a photograph of the Club, transferred to a CF card and inserted into the Sentinel III.



FIGURE E is a picture of what the display looks like when a floor card is inserted and the slot door is open.

What about the Sentinel and slot machine end of it? Darn near everything has to be perfect. By that I mean ALL of the doors have to be showing CLOSED on the Oasis end. Slot door, drop door and the logic door. If not, an error code will be displayed. The game, Sentinel, and Poller have to have good communication also. The game has to be at a total "idle" state too. The paper can't be low nor a bet made. A game cannot be in progress.

Sometimes there are other problems that arise. Oasis has certain S and G error codes, S meaning that it may be a SYSTEM problem and G meaning it may be a GAME problem. The codes and descriptions are shown in the table to the right.

If the Oasis display shows "Account Locked," this means that a customer entered their PIN number incorrectly three times or more and they need to go to the Players Club to have their PIN number reset.

Konami-No Main Power

While making a round on

the floor, I noticed a Konami slant top game was shut down. Well, what appeared to be shut down. One of the first things that I saw was the Oasis display wasn't lit up which meant that there was a possibility that the Sentinel didn't have any power. When the game was opened up there wasn't a sign of any power anywhere; the game was totally dead. Since it appeared to be a main power

problem, I thought to start with the main incoming power area. The 120VAC power cord was plugged into the game which meant there was a good chance I had power up to the end of the cord. What about the main 10 amp fuse? It was marked with a red sticker that even stated "main power fuse 10A." I took the fuse out and right away I could tell it was blown. It had black marks inside of

"G" Codes

- G-2 door open
- G-3 transfer limit too high
- G-4 transfer limit too low
- G-5 SAS problem
- G-6 credit switch
- G-7 tilt condition
- G-8 SAS problem
- G-9 game in progress
- G-10 & 11 SAS problem
- G12 disabled by SAS
- G-13 out of service
- G-14 busy SAS problem
- G-16 AFT locked, game in progress or door open, etc.
- G-99 AFT not locked COM lost during transfer
- G-22 time out, (reboot the Sentinel)
- G-23 "Bart" problem (accounting)

"S" codes

- S-22 SAS timeout
- S-23 denomination mismatch
- S-24 COM lost between Sentinel
- S-32 invalid transaction ID, poller and Sentinel versions aren't compatible
- S-33 game COM down
- S-34 dollar amount out of limit
- S-35 AFT mismatch, machine and Sentinel IDs don't match

OASIS Error Codes

it, meaning it was blown violently.

Now the question remains, why did the game blow the fuse? Upon further inspection of the fuse, it was stamped 2A. This can't be right, so I checked it again. Sure enough, it was a 2 amp fuse that was in a 10 amp socket. At least this indicated a reason why it may have blown the fuse; 8 amps under-rated! I asked a co-worker to watch the game for me while I went to grab TWO replacements. Why two you may ask? One to put in the game and the other just in case the first one blows (this sometimes saves an extra trip to the shop). As soon as the replacement fuse was installed the Oasis display lit up. Next, the power to the game was turned on. It started booting up beautifully and everything looked to be OK. The main door was closed and I made sure that the bill acceptor was working. With the properly rated fuse replaced, the game was back online.

Editor's Note: Errors like this can be costly. In this case, an under rated fuse simply left the game non-functional (and WHY was the fuse replaced originally and WHO installed the incorrect fuse? This is why we fill out the MEAL card!). However, things can be worse if an OVER rated fuse is installed. I have seen on a couple of occasions where the accidental installation of an over rated fuse has caused additional damage. In one case, a 2.5

amp fuse was replaced with a 25 amp fuse (missed the decimal point, I suppose) following the original, intermittent failure that opened the fuse. When the momentary short reoccurred, the high current (now available without over-current protection) spot welded the pinched power bus wire to ground, changing the nature of the short from intermittent to permanent and destroying half the wire harness in a smoky, molten mess of melted plastic insulation.

The moral of the story? Be observant when replacing

fuses. If you cannot clearly read the fuse value, use a magnifying glass to be certain. In fact, to be certain of the correct fuse value, it is really much better to read the label that is displayed next to the fuse holder rather than look at the fuse itself as it may have been replaced incorrectly in the past, perhaps because the proper replacement fuse was unavailable at the time. Naturally, if you don't have the proper fuse in stock, you will be forced to install a fuse of a higher current rating. This is a bad practice. You should al-



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ways have a good stock of replacement fuses on hand.

Oasis COM Down

The first indication that there was a communication problem with part of a bank of games was one of them locked up for a small payout. It was a nickel game and the payout was for \$30.00. The way most of our games are optioned (we still have a few coin games) they only lock up for \$1200.00 or more. It caught my attention for a moment, why did it lock up? I mistakenly brushed it off as paper being out and not a game or system communication problem, which no doubt was a mistake on my part. Not long after, while walking past the cashier cage, a cashier called me over and said that there were a few tickets that “wouldn’t go through” meaning that there, more than likely, there was a communication problem with a bank of games. The machine numbers were written down from the tickets. I looked up their location and sure enough, it was the same bank of games that had the small payout. I went to the games and part of them were in lower case letters. Lower case letters on the Oasis display indicates that communication has been lost. Only half of the games were lower case letters so I found the two games that had upper and lower case next to each other. The top glass was removed from the game that had communication and I saw the problem right

away. On the Sentinel, the COM out cable was almost completely off. There was a good chance, when the last person was in the game and put paper in it, (the printer being up top) once the Oasis bracket was put back in place, it pushed off the COM out connector. To put it another way, when paper was filled, the card reader on the Oasis bracket pushed the connector nearly off because the Sentinel was too close to the bracket assembly. As soon as the COM out connector was properly seated, the communication on the rest of the games worked great. It was simply a loose connection. I verified by inserting my floor card and it did show a data port number. If the DPU number was zero, then there still would be a problem, but everything was fine.

Aristocrat Viridian-No Game Graphics

I was called to an Aristocrat Viridian game. The customer stated that he had hit a bonus when both of the LCDs suddenly went black. The game buttons were lit up but there wasn’t anything on the screens. A reboot of the game was done and it started to boot up fine; the game had to “boot text” like it was supposed to. Then, when the game graphics were supposed to appear, both LCDs went black. If it was in fact an LCD problem, usually they will come on for a second then go black but in this case, both did so I suspected a software prob-

lem and not a hardware problem. I turned to game off and on once again and the same thing happened.

So, where should I start troubleshooting? One of the first things that was done was the main processor board was removed to see if anything was out of kilter. Everything looked OK, so I removed the “smart card” and reseated it and also made sure the game CF card was seated properly. Next, I put the processor board back in the game and turned it back on. The game started to load once again and this time the game graphics came up and the game was back in play. As for the \$178.00 in credits that appeared, a slot attendant and floor supervisor previously did a payout for the customer. I verified the credits earlier with my “tech card” (aka mechanic card), so a payout could be preformed so the customer didn’t have to wait while I worked on the game. A floor supervisor cashed out the credits and brought the ticket to the cage so now the game was ready for the next customer. For the remainder of my shift I didn’t hear of a complaint about the game so it was good to go.

JCM UBA-Frame Problem

First of all, what do I mean by “frame?” It is the metal structure that the UBA rests on and the stacker box sits in. Once the UBA and stacker box is removed, the frame is the part that is left in the game. With the

WBAs, we replace the frame when the gears located in the back part of the assembly get worn or have a tooth missing on a gear. The frame is removed and the gears are replaced. Also, the stacker box tabs are inspected to see if they are bent. If they are, they are straightened so that the box fits nice and snug (there is a special tool for this, available from JCM). With the UBA in a few of our IGT AVP games and a couple of our WMS Bluebird 2 games, a tech would have to reseal the stacker box numerous times until it would sit perfectly in the frame so the bill acceptor would function properly. The bill acceptor bezel light would be lit up but once a bill or ticket was inserted, it wouldn't even grab it. A UBA motor would spin for a few seconds, then the game would go into a bill acceptor tilt. A temporary fix is to repeatedly reseal the box until the unit cycles properly and the bezel lights up. THE UBA HAS TO BE TESTED AFTERWARD. We use a blank ticket from the game to test it. If it isn't working properly, the UBA won't even grab the ticket and tilt. If it is working properly, the game will grab it and kick it back out again. Sometimes gently pushing upward on the stacker box once it is seated will get it working again and sometimes replacing the stacker will get the bill acceptor working. Reseating the bill validator itself may get it working too. I suppose you can try to replace the UBA frame.

So far there is not a perfect cure for the problem that I am aware of.

Editor's note: It's always nice to be able to go right to the source of all that's holy at JCM. Here are comments from JCM's bodhisattva of bill validators, Jack Geller: *There are a couple of things that could cause this. The author mentions the tabs in the bottom of the frame unit. These must be at the correct angle or the gears can skip causing the unit to error out. For the adjustment procedure refer to the August 2008 tech bulletin <http://tinyurl.com/jcm200808>.*

The other cause may be an improperly seated UBA unit. If the unit isn't fully seated, with the lock tabs down, the flag in the rear of the frame

that signals the pusher plate is moving will also cause a fault and the validator will shut down. With ID-024 software, the unit may not cycle after the cash box is replaced. The first time the validator checks this movement is when a bill is inserted.

If you see this problem, first check the tabs in the bottom of the frame. These take a lot of abuse from the drop teams. If they seem OK, check to see the release tab at the front of the validator is fully locked down and the validator is seated properly. - JG

- Pat Porath
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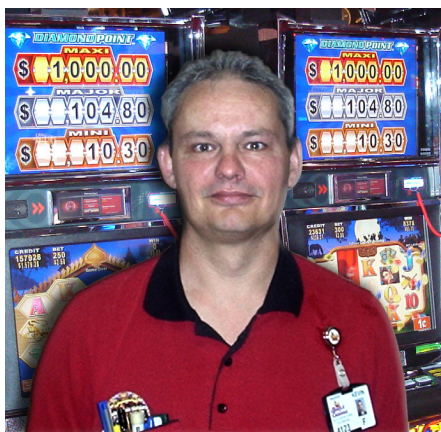
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Basic Information

- The EZ Pay system was designed to decrease the downtime of hopper fills
- IGT games will boost the fiber signal in the loop. Try and have some on each CVT.
- The TPE_RPT (Transaction Processor Engine) that I continuously write about here in Slot Tech Magazine is a set of programs that monitor and gather information on the EZ Pay system.
- The TPE_RTP displays all information and errors at site level. The program allows for a back up of 30 days, for tracking purposes.

EZ PAY Made EZ

By Kevin Noble

- TPE_RPT, this report runs from midnight to midnight daily.
- Also there is a TPE_PROC LOG that allows you to check things at the server level issues. An example would be the site being off line. This report also gives you valuable ticket information, which will allow you to know if your CVT daughter board is good. This information becomes valuable when having to change out a CVT,
- 50 slot machines are allotted per CVT (35 is recommended for load balance purposes) & 16 CVTs per Digi (or Serial Concentrator)
- The CVT will send continuous messages through the fiber loop and expects the message to be received back.
- The TPE_LOG can help you determine if the issue is machine, CVT or system based.

The CVT (Clerk Validation Terminal)

The CVT is the responsible for the machine seed/validation numbers. The CVT sends the VGM a seed number, when a patron cashed out the game flips it to an 18 digit validation number. Once the VGM has issued this validation number it in turn replies back to the CVT that it has been used and another is required. The game then holds this seed/validation number until the next cash out.

The CVT itself can be used as a diagnostic tool. On the front of the CVT there is a panel of LED lights that allows you to start your troubleshooting. The modem "A" transmits and received Led's shows the communication between the CVT and Cross Validation Unit or server. The Fiber "P0" (Standardized ports throughout the OLG), shows communication between the CVT and the gaming machines out on the floor. With both scenarios remember that we have connections at the back of the CVT, they also need to be checked before going to far. The power LED will flash green until the power is full, then it will remain illuminated green. The processor and battery lights will be off, if illuminated red you are looking at issues with your CVT.

The CVT/VGM status test allows you to determine whether or not the games on the CVT are communicating or

responding. A poor fiber signal could display or print out "No Data." Another tool is the Gross Meter report that allows you to verify if the game is communicating. Another "No Data" display means the machines are not communicating with the CVT.

The fiber loop test allows you to test the loop for any errors, kinks, or disconnections in the line. There are two counters displayed on the CVT: The primary counter shows the packets of data being sent by the CVT, through the loop while the secondary counter is the number of error packets received. In this test, if the error count keeps increasing there is a possible disruption in the loop. The ideal situation would be for the error count to not increment. An intermittent increase in the secondary counter could mean a faulty fiber board, COMM board problem, power supply or a connector problem. Make sure there are not too many extra connectors on the line. If the secondary counter increments at the same rate there is a possible incomplete loop, the signal is unable to complete a full circuit. The possible problems could be a disconnected line, looped in incorrectly, crossed lines, or a break in the fiber. The fiber loop test can also be used to prove that your CVT is running properly and the fault is with a loop or game. Try keeping a piece of fiber close to your CVT cabinets for just this check.

TPE Logs

The TPE (Transaction Processor Engine) report log and the TPE Process log are a set of programs that monitor and gather information on the EZ Pay system. The TPE log displays all information and errors at the site level. This is very useful to determine what time it started and what was happening when went down. Here is an example of machine events that are logged and displayed for us to troubleshoot.

**009-03-17 04:00:25 FE: 001 CC: 18
Mach: 10 MachID: xxxxx EVENT: 82 No
machine ID/asset number reported
from machine**
**2009-03-17 04:00:26 FE: 001 CC: 7
Mach: 21 MachID: xxxxx EVENT: 58
VGM not
responding**
**2009-03-17 04:00:27 FE: 001 CC: 3
Mach: 10 MachID: xxxxx EVENT: 82 No
machine ID/asset number reported
from machine**

The other program that is useful is the TPE PROCESS log that displays information and errors at the system level. This is an example of a CVT that was just force downloaded.

2009-03-17 09:20:19: (Thread: 6536) FE: 001, Port: 11 reported error (5), CTS Timeout
2009-03-17 09:20:19: (Thread: 6536) 1 OFFLINE CCs notified on FE: 001, port: 11
2009-03-17 09:20:30: (Thread: 6536) FE: 001, Port: 11 reported (1), Normal
2009-03-17 09:20:46: (TPE_XVU) Txn: 169, Seq: 34 from DB_XVU, CC: 11, download complete for 0 tickets rcvd

The Forced Download

This force download is mentioned quite often in my articles but it is used at a last resort in troubleshooting machine problems. During the training we started to keep track of issues being called in to IT and there has been a great decline. Also during the training sessions while reviewing the reports together from various sites we have seen a reduction in the amounts of forced downloads being completed. The EZ pay system has made it easier to troubleshoot using the reports available. Most of the time they will lead you to a game issue. A forced download may be necessary when RAM clearing any Atronic games on our floor that would not come online. We usually get validation not enrolled errors on the screen. Duplicate address numbers is also another occasion when a force download may be required.

Common Machine Problems Encountered

Printers

- Lost programming
- Out of paper
- Dirty – printing half a ticket, smudged or smeared ticket
- Paper placed in backwards – prints out three or four tickets at a time.
- GEN 1 – head tension screw too tight and brass alignment bracket bent
- Game not programmed correctly or optioned right
- UGM BOARDS – falling asleep and needs rebooting
- BALLY S6000– GEN 1 – printer bracket either loose or misaligned
- Refer to BALLY Field Advisory FA-04005 for recalled GEN 1 printers
- IGT SLANT TOP – printer assembly not pushed back in home position
- GEN 1 PRINTER – backboard in printer housing bad, dip switch incorrect
- 38/36 codes on the Bally S6000 – opening and closing the door sometimes clears this message
- Printing blank or duplicate tickets (see below)

- Tickets are found rolled up in the head
- Customers are pulling the tickets before it is finished printing the complete ticket causing a ticket jam
- Printer tilts stack up rapidly on IGT S2000s, open and close the main door until all tilts are cleared.

CVT

- Force download
- Log on to the CVT to clear the error codes
- Refer to IGT CN 3594 to clear and set software and follow procedures
- Soft RAM clear may be required after a battery change
- Expansion memory card commonly fails

Manual Jackpots

- Game off line
- Player tracking cards stuck in printer
- Duplicate addresses may be assigned to games on the same CVT.
- Powering down the game on some manufacturers breaks the fiber loop
- Fiber loop test is being performed

Information

Duplicate Tickets

During periods of intermittent or lost connectivity, it is possible for a duplicate ticket to be issued by the slot machine. This is not a system issue but almost always due to connectivity problems at the machine level.

When this occurs, this indicates that the machine lost communication with the CVT and was unable to communicate the successful printing of the ticket or the use of that specific validation code back to the CVT and subsequently back to the system.

When the machine comes back on line the ticket information that was stored is then placed onto the next ticket that is issued by that machine.

Duplicate Machine Address

Most common problems are when a machine move happens and the poll address is not changed after the fiber line is disconnected. This also happens when we receive new games from the warehouse and they are tested with poll numbers assigned at the shop. We are trying to get in the habit of either changing the poll numbers before we take them off the base for an internal machine move and before we hook up the fiber when we receive new games from the warehouse. We also experience this problem when the machines were re-enrolled and every game on the bank had a duplicate address on the CVT that had to be cleared.

Chirping

This is an indication that the machine with the “Chirping” message and/or the machine before cannot communicate back to the CVT. The machine started to reestablish communication with the CVT by sending additional information. Check to make sure the connections are not crossed or one of the fiber lines is not broken.

Fiber Loop Up/ Fiber Loop Down

This message indicates there is some form of a break or kink in the line. Other possibilities are disconnected fiber, faulty COMM boards, fiber boards, bad fiber board power supplies, SPC II boards and bad connectors or crimps.

VGM Responding

This message indicates a problem with a weak signal within the loop or a machine and/or show when a machine re-establishes communication with the CVT.

No Machine Number / asset number reported by machine

This message indicates the packets of information were lost between the CVT and the machine. This message is also displayed when the machine comes back on line.

Security Event Buffer Full

This message indicates the memory of information being stored in the buffer have exceeded its capacity to record all the errors generated. This can result in communication issues.

Invalid Voucher Sequence

This message is due to corrupt data being sent to the machine from the CVT. The machine will assign the corrupt number to the next ticket that will be printed. This then leads to unmatched information the CVT is looking for when a customer redeems the voucher. Faulty or limited communication between the two is usually the problem with this problem and the errors created will cease once normal communication is established.

Unverified Tickets

Unverified ticket generally means that there was limited or no communication at the time of the ticket being issued and some of the data were lost. As not all the information was available (missing sequence number, improper validation sequence, incorrect site code, incorrect \$ amount etc.) the system basically flags the ticket as unverified. Sometimes it is just that the information did not get back to the database and needs a few minutes to catch up.

- Kevin Noble
knoble@slot-techs.com



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

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

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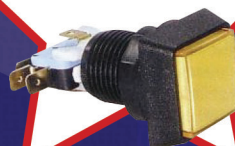
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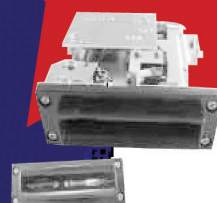
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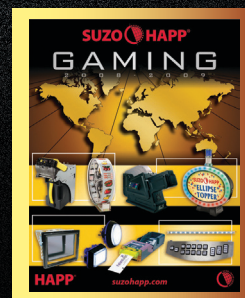


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