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July 2008
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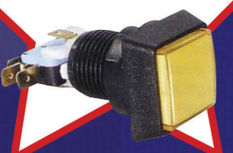

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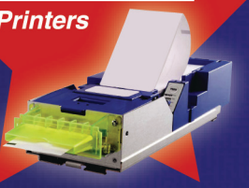

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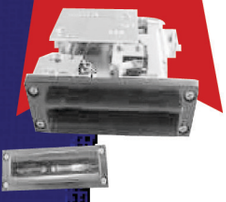

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Inside Slot Tech Magazine

July 2008

Slot Tech Magazine is an official publication of

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Calling Europe and the World!

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This month's Slot Tech Magazine has a lot of what people tell me they like about Slot Tech Magazine, namely symptoms and solutions. Oh sure, it's really great to discuss how things actually work. We do a lot of that too. This month, our Maltese correspondent (that means he lives on the tiny island nation of Malta. Really! He does!) James Borg takes a look at the monitor's degaussing circuit and how it works. But true to form, he also tells us what fails and how to find it. James' article begins on page six.

And so it goes with Pat Porath's Quick and Simple Repairs #40. Pat always gives us exactly what we're looking for, a detailed description of the troubleshooting steps taken and the final resolution. There is no point in listing all of the items he covers this month. Better to just read the darned thing, beginning on page 16.

Canadian Correspondant Kevin Noble has thawed out for the Summer and gives us, in my opinion, one his best compilations yet of symptoms and solutions on a range of subjects. Long on text and short on illustrations (there isn't a single one) it's a very good read with a lot of interesting fixes. See page 27.

And finally, one more thing. Slot Tech Magazine now has an office in Second Life, where I am known as Randy Zarf. The office is in Walleye but the easiest way to find it is to use the search function and search for Slot Tech Magazine. You can then teleport to the office. There, you can browse through some of the Slot Tech archives or just stop by to say hello. If you don't know what Second Life is, go to secondlife.com, download the software and be prepared to enter another, sometimes very weird world. Oh yeah, and you can fly too. That alone is worth the price of admission.

Randy Zarf

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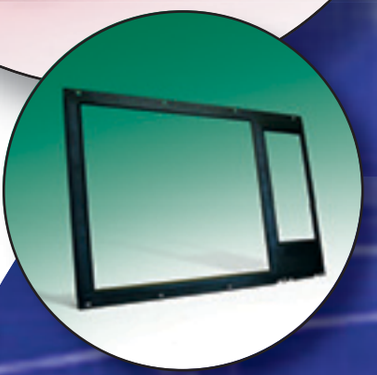

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To Degauss or Not to Degauss? That is the Question

By James Borg

Actually the question is,"What is Degaussing?" Some have probably come across it from home when they fiddle about with their computer monitor screens to try and get a better picture. If they're bored, they'll probably start to investigate what each of the menu headings on the screen does. If it's an older type, chances are that there's a button at the front that says "DEG" which is just short for Degaussing. Eventually degaussing evolved into an icon on the OSD (On Screen Display) which says DEGAUSS. When activated, it makes a "bong" noise which causes the whole screen to start jittering and seems like the monitor's breaking apart for a short time. Crazy colours are displayed for a few brief moments on the screen and then it all settles down again. Of course, you've just degaussed your monitor. But what have you actually done? Normally you don't have to do this as the monitor is designed in such a way that on turning it on, it has a circuit which causes it to degauss itself automatically.

By definition, the word "Degaussing" simply means neutralising or removing the magnetism in a metallic mass or device. The word honours German mathematician Karl Friedrich Gauss, just in case you were wondering where the term came from. The device to be degaussed can range from the steel hull of a war ship to the CRT and metal frame of a slot machine's monitor. In the case of the ship, an electric current is passed through wires or coils along it to neutralize the surrounding magnetic field, hence magnetic mines won't be a huge threat any more because they won't be able to detect a magnetic field. In the case of a monitor, it has a rather different reason but basically does the same thing. It works on the magnetism involved. It's also worth mentioning, that black and white screens and flat panel displays don't have this sort of problem cropping up. Reason being is that flat panel displays (LCD and plasma) use different technologies than a CRT. In the case of the black and white screens, well, these don't need to be degaussed as you'll find out along the way.

When electrons leave the guns at the end of the Cathode Ray Tube (CRT) neck, they are shot toward the front of the tube in the form of beams. There are three guns and each gun emits a narrow beam. These are the red, green and blue beams, or rays. These three beams aren't in themselves colored, but consist of electrons which are moved/deflected/steered all over the front of the tube by means of magnetism. Fascinating, but totally true.

On the neck of the tube are two pairs of coils. One is used to control the Horizontal Deflection and the other is to control the Vertical Deflection of the beams as they leave the guns and make their way to the front of the screen. Some refer to these deflection coils as "steering coils" which is basically the same thing.

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They act a bit like a glorified solenoid as used in a coin diverter. However, instead of pulling on the slug, these coils exert a magnetic field that controls where the beams will hit the front of the tube giving us the image we would like to see. We won't be going into these deflection coils in this article but the focus here lies on where the beams actually hit the screen. Better still what happens when the beams don't hit where they should hit on the screen, and how to rectify that condition.

Inside the tube (a vacuum tube, incidentally) these three beams strike the phosphor-coated screen at high speed, causing it to glow. The electron beam's kinetic energy is transformed into light energy as these collide with the screen. Pretty neat trick when you think about it.

In the case of a black and white tube, just a simple coating of phosphor is applied. However, in a color CRT, phosphors of three different colors are applied: red, green and blue. These consist of small dots for each of these colors, and often are arranged in a triangular pattern called a triad (Fig 1)

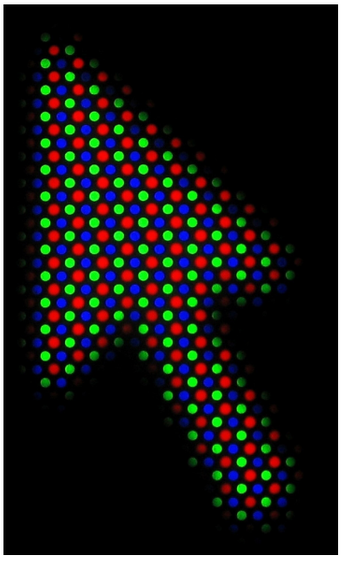

Fig 2 – Phosphor Dots up and close.

If you look close enough at a monitor's screen (use a magnifying glass) you can see these little dots (Fig 2). Each of the three beams is intended to strike only the phosphor dots designated to it. That is to say, the "red" beam is supposed to hit the red dots only, the "blue" beam is supposed to hit the blue dots only and the "green" beam is supposed to hit the green dots only. If that doesn't happen (if the beam hits the wrong color phosphor) the image quality will suffer. To help with this process, a guide was devised. This is a sheet of metal with a pattern of fine holes punched in it. It is positioned about one half inch before the dots. This guide is called the Shadow Mask (Fig 3).

The shadow mask is commonly made of an alloy of iron and nickel called Invar. The metal has a low coefficient of expansion and is ideally suited for this job. The reason for using such a material is that stray electrons hitting the shadow mask will cause heat. Heat causes expansion that will distort to some extent the shape and alignment of the shadow mask causing

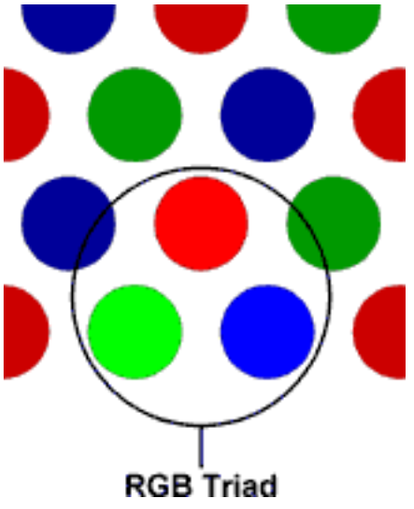

Figure 1

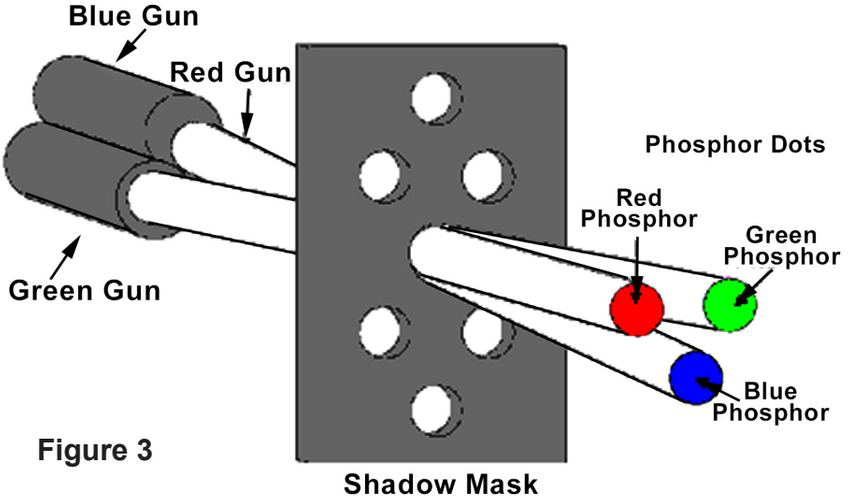

Figure 3

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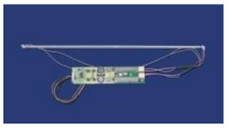

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havoc and impurity on the screen. This can prove to be an eyesore, so Invar is used to minimize all this.

The three beams leaving the guns are directed towards the front of the tube and pass through the shadow mask, then striking the phosphor dots on the screen. Only about 25% of the beams actually make it through the holes in the mask and hit the screen. The rest bounce off the shadow mask causing heat and the problems that occur as explained earlier on. That's all well and good providing there are no external magnetic forces that will hurl the beams slightly off their projected course and don't strike where they were intended to hit in the first place.

These external magnetic forces can originate from a wide variety of sources. A typical example is a set of speakers being placed right next to the monitor. An external power supply is also a likely culprit. Just for a kick, placing the tip of a magnetic screwdriver close to the screen does it nicely. You can try this for yourself by placing something magnetic near the screen and see what happens. Something a bit more eerie is to turn the monitor round a few degrees while switched on and you can see it happen before your very eyes, without any apparent magnetic fields to blame. This is due to the Earth's magnetic field doing its part. Turning the monitor back to its original position will bring the picture back to normal. The effect is quite fascinating, but it's not a good idea to leave magnetic sources close to the monitor for a long time. Reason being that the shadow mask can become slightly magnetized and retain that magnetism. OK, so what happens if it does retain that magnetism?

If the shadow mask itself becomes magnetized, it will have just the opposite effect that it's supposed to. Instead of guiding the beams to the proper phosphor dot, the magnetic field will bend the trajectory of the electron beam so it hits the wrong color.

There's more than one solution to that problem. One is to hit the Degaussing button (which you probably came across when fiddling with the controls). If that doesn't do it, a good idea would be to turn the monitor off for 15-20 minutes and leave it be. Switching it back on again most times will cure it. If that doesn't do it, you might need to think things over a bit. If it's still not up to scratch, then there's a problem that needs to be rectified. One can try to manually degauss the monitor.

You an external degaussing wand. The process of using the wand is quite simple and straightforward. All this wand is in fact is a coil with a switch that turns ON/OFF the mains feeding it. The switch is a push-to-make or a momentary switch and this is used for the simple reason that the coil gets hot...VERY HOT. It is a momentary duty tool: One minute on, five minutes off generally speaking. The process to manually degauss is to bring the coil or wand close to the screen, turning it on and moving it in a circular fashion about the front, both sides and the top of the monitor.

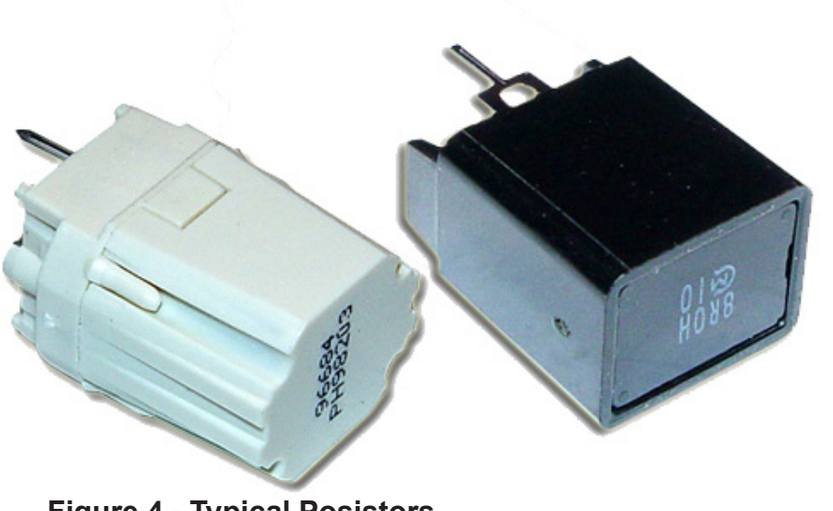

Figure 4 - Typical Posistors

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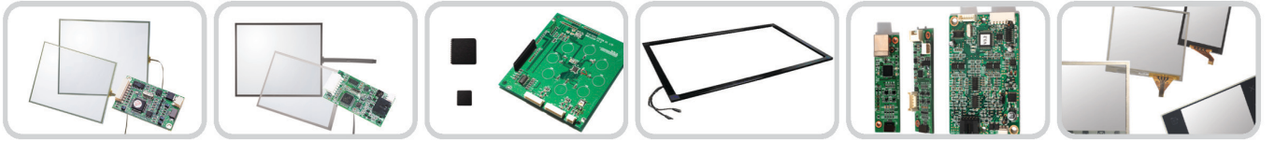

Move the coil a few feet away from the monitor before releasing the mains switch. From start to finish, the switch must be on until the process is completed. Don't flick it off and on half-way through as you may end up with a screen that is worse off than when you started.

Incidentally, this process won't work if you have color problems because you have dropped your monitor as most likely the shadow mask inside the tube would have become distorted. So it's suggested not to drop it in the first place. Don't!

As mentioned earlier, degaussing is done automatically when the monitor is turned on. This is due to a clever but simple circuit that involves the use of a component called a posistor. A posistor is a positive temperature coefficient thermistor.

Um. Ok. What's a thermistor in the first place? A thermistor is a type of resistor that varies its resistance according to its temperature. Thermistor comes from the combination of the words Thermal and Resistor. There are two types. One type, called a negative temperature coefficient (NTC) thermistor will respond to in increase in temperature by decreasing its internal resistance. A PTC is just the opposite. A posistor is a component whose resistance increases the more the temperature rises. .

These are usually located close to where the mains circuit is situated. Below is a picture of a monitor with the posistor shown (Fig 5). As a general rule, these components are usually in the same area. It's purely from the design point of view in order to keep the components using the mains voltage situated in one area of the monitor.

In most cases, the reason why the degaussing circuit isn't working would be due to a fractured solder joint (sometimes referred to as a dry joint) on one of the pins on the posistor. It makes sense when you think that this component gets hot. The heat is transferred to the leads on to the solder side and will eventually destroy the solder connection and a dry joint would develop. Sometimes the pad with the problem joint has become black due to arcing since there are mains voltages present there. Turning the monitor board over to have a look at the solder side will quickly reveal the point in question. Trying to apply solder to such a connection might prove to be a bit difficult due to the carbon deposits so cleaning of the leads and the pad before soldering works wonders.

A dry joint isn't always the cause of such faults in these cases. It could be that the posistor itself has become damaged. A quick test is to unsolder it from the PCB and shake it about a bit. If it makes a noise like it has bits running around inside, that's a good enough test to throw it away and get a new one put in. It has been known that even though it doesn't make any noise whatsoever, the component itself could be faulty and a test with a multimeter on ohms range will soon give you a better idea of the state the posistor is in.

This is done by attaching its ends to a multimeter on

Figure 5 – Posistor seen bottom left of the picture.

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ohms range and using a source of hot air (such as a hair dryer) to blow on it. It's best to check it out when cold so if it's just been de-soldered and pulled off of the PCB, let it be for a while or give it a quick squirt with component chiller (normally used for spotting thermally intermittent components). The resistance measured when cold will be low, maybe a half-dozen Ohms. Once the component becomes warmer by blowing hot air on it, its resistance will increase gradually. The more heat is applied, the more the resistance will rise. Obviously this will depend on the component's specifications. When cold, its resistance would be in the order of a few ohms but when hot, this would run up to Kilohms. Once the posistor starts to cool down again, its resistance will be seen going down to the original value when cold. If that happens, then chances are that the component is fine. If there's no change in resistance or the value doesn't go up a great deal when heat is applied to it, then more than likely the part is no good and would require replacement.

Here are a couple of different circuits but the end result is the same – that is they both demagnetize the screen. One is using a simplified circuit, while the other is using a relay (which is what you can hear clicking in the background when you press the degaussing button). You'll note that the posistor unit actually contains a second, purely resistive element. Can you guess what this is for? It acts as a resistive heating element to keep the PTC itself warm so that it doesn't cool down and allow AC current to flow through the degaussing when the monitor is in normal operation.

Typical Faults:

Fuse blown:
Posistor shorting inside.
Replace posistor.

Degaussing not working:
Dry joints on posistor leads.
Resolder.
Degaussing coil itself open circuit. Replace coil.
Shadow mask damaged. Tube needs replacement.
Relay contacts faulty or relay not operational. Check and replace if necessary.
Posistor open circuit. Replace.

That's it for now… but I'll be back with more next time.

- James Borg
jborg@slot-techs.com

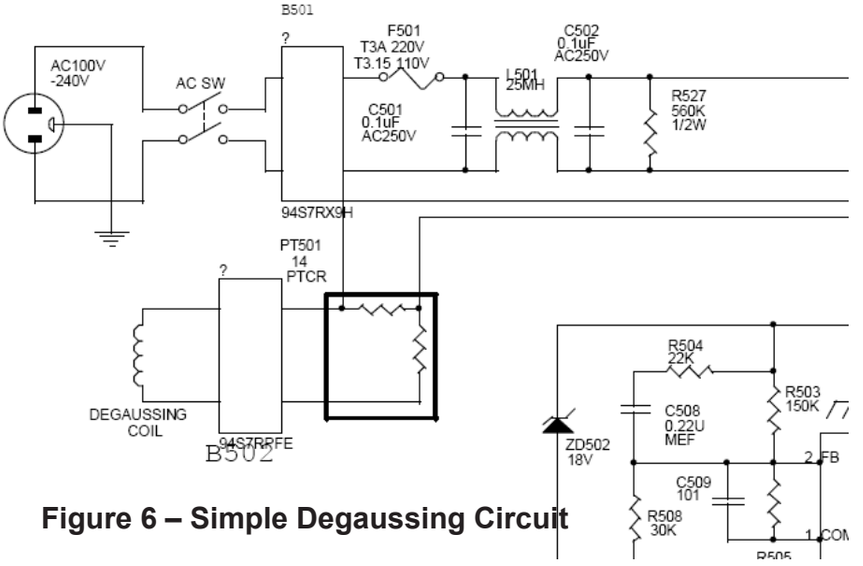

Figure 6 – Simple Degaussing Circuit

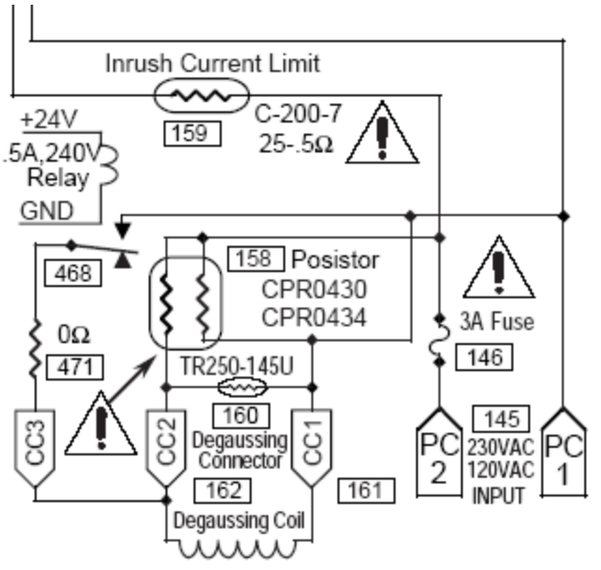

Figure 7 Degaussing Circuit using a relay.

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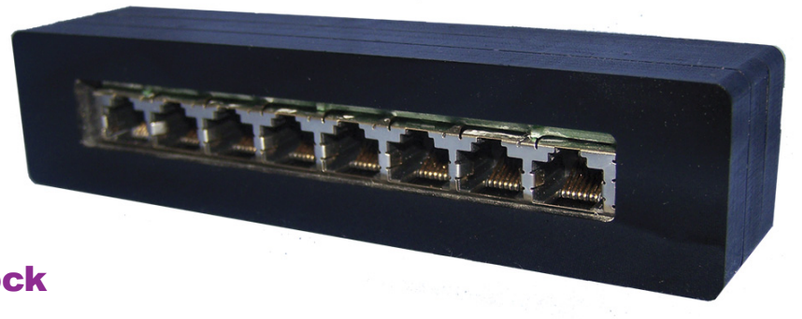

Kiesub Introduces Cat6 Shielded Harmonica Patch Block

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Las Vegas, NV - Electronics Distributor and Contract Manufacturer KIESUB ELECTRONICS recently introduced the Cat6 Shielded 8-Port Harmonica Patch Block, used for daisy-chaining banks of slot machines for player tracking and progressive applications.

The Harmonica is designed with three layers of protection to guarantee 100% shielded circuitry. The data ports are packaged in a 100% shielded array, and the inner shielded connection of each position terminates both shielded and unshielded data cables. The array is surrounded by a heavy-duty case, adding strength and durability. Packaged in thick-wall outer-insulating acrylic ensures that the Harmonica avoids ground potential differences with other electronic equipment

Mike Johnsen, Director of Contract Manufacturing, designed the new Cat6 Shielded Harmonica based upon requests from the Gaming & Casino Industries. Kiesub continues to design and manufacture new and innovative products for the constantly changing technologies of these industries.

The Kiesub Electronics Contract Manufacturing Division was established in 1995, and specializes in manufacturing cable assemblies, wire harnesses, circuit boards and custom-application turnkey products. Services include engineering, design and application drawing. The company also designs and manufactures several custom application products for which it owns the rights to, for the Gaming, Banking and Amusement Industry.

Kiesub continues to maintain an active industrial distribution division, an active Internet commerce site, as well as a recently expanded electronic parts & components open door store.

Quick and Simple Repairs # 40

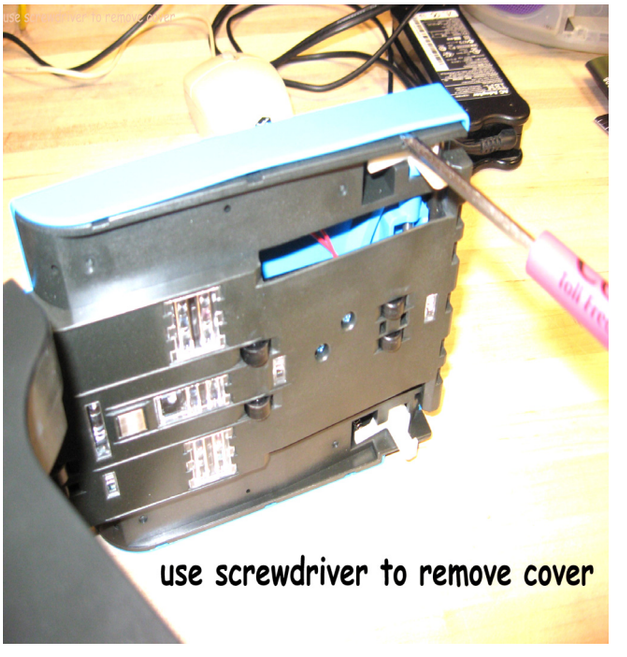
UBA low acceptance rate

If you have a UBA bill acceptor that has a low acceptance rate, (rejecting a lot of bills) it may be caused by dusty "sensor covers." We recently ran into a few that were rejecting quite a few bills and the problem was dusty sensor covers.

How would you clean them? The unit appears to be sealed and looks like it may be difficult to disassemble. Once I was shown how, it was like using the "Easy Button" in the Staples TV commercial -That Was Easy! The only tools you need are a small flat blade screw driver and a Phillips screwdriver. First of all, open the UBA and take a look at the sensors. Are they dusty? Does the unit need to be taken apart? Once it is blown out with compressed air and the bill path sensors and optics are clean and dust can be seen on the INSIDE of the sensor covers, then it will need to be taken apart and cleaned.

When looking at the picture of the blue UBA cover once off of the unit, you can see the small notches that need to be GENTLY pried upward. Once all six of the notches are loose, the cover will come right off. DO NOT use excessive pressure to remove the cover. Only slight pressure and a twist of the small flat head screwdriver and it will be ready to take off. Now you will see the "upper sensor board" which has six small screws that hold it in place, and one white, two pin connector. Remove the screws and disconnect the connector. Lift the board upward to expose the various components that help the UBA do its job. You should see the sensors, the sensor covers, and magnetic head. If any of these are dirty or dusty I would use compressed air and a Q-tip to clean them. I personally would NOT use any liquid cleaner unless it is VERY dirty. Only then I would use a diluted mild soap solution for cleaning. Once the components are nice and clean (and once it is completely dry if a liquid was used) the UBA can be re-assembled. After the screws are back in the upper sensor board and the two-pin connector is plugged back in, simply close the unit and CAREFULLY snap the cover back on. That's about it. Of course you would want to test it afterward just to make sure that the UBA is repaired and does easily accept bills and tickets. Don't let the sleek looks of the UBA fool you; they are quite "Quick and simple" to work on.

To perform a "stand alone" bill acceptance test, (without cashbox) it is as follows:
1. Remove power from the UBA and set dip switches 1, 2, 3, and 8 to ON position.
2. Power up the unit, then turn dip switch 8 to OFF. It should "cycle" after a couple of seconds.
3. Insert a bill, it should accept it. If not, it may need to be calibrated or other repairs may be needed such as a sensor board replacement.
4. Power OFF the unit and set



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dip switches back to their original positions.

If the unit still won't accept bills, then it may need to be calibrated with a laptop. The instructions and download are at www.jcm-american.com. After calibration is complete, and the unit still doesn't work properly, a board or other component may need to be replaced.

WMS 550 Slant Top Tracking System COM Problem

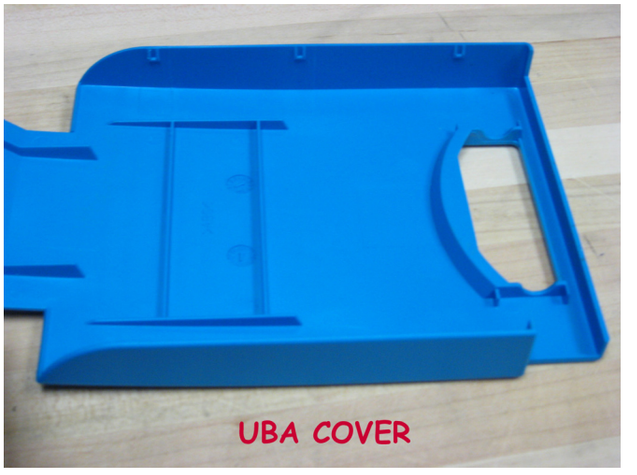
This particular older WMS 550 slant top would not communicate with our CDS system. The game options were checked and rechecked. The settings were "SAS" and it was on "address 1" and all of the other options were all set correctly as well. Maybe the Sentinel board was bad? I replaced it and still no change in the game. What about a game RAM clear? It couldn't hurt to try, maybe something was corrupt? Two RAM clears were done and that didn't help either. Next, the game interface cable was checked to make sure it had a good connection. The three wires on the Sentinel and the one wire on the SMIB looked good. On the game side of it, that connection looked good too. Even the connections at the backplane board looked good. I put the game in "out of service" mode and when I came back, it would NOT come out of "out of service" mode. I tried everything! Rebooting the game, the diagnostic button, the jackpot reset key switch, a combination of both, the jackpot reset switch with the door open, and with the door closed. Nothing I could do would put the game back into "game mode."

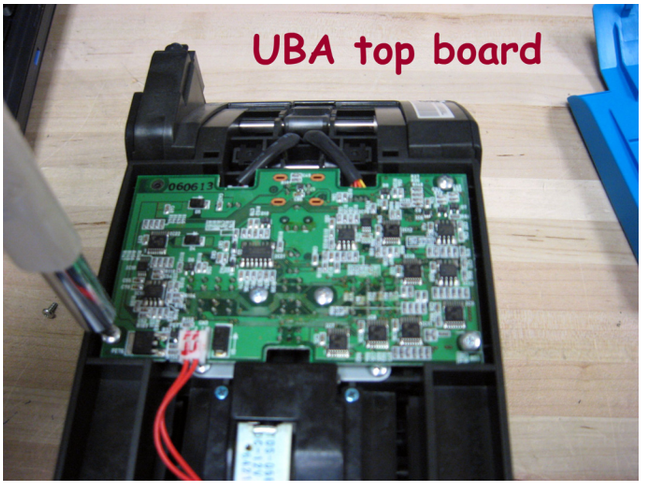
The main processor board was replaced too. That didn't fix the COM problem either. While trying to think what else was left to replace, a co-worker made a simple yet effective suggestion: the I/O board. DARN! I didn't even think of that board. Immediately, I swapped with the game next to it and the game communication worked right away. I replaced the board with a spare from the shop and now both games are working perfectly. So, next time an older WMS 550 slant top doesn't want to communicate with the tracking system, don't forget about the very important I/O board like I did. With the replacement I/O board installed, the game was working perfectly and was back online.

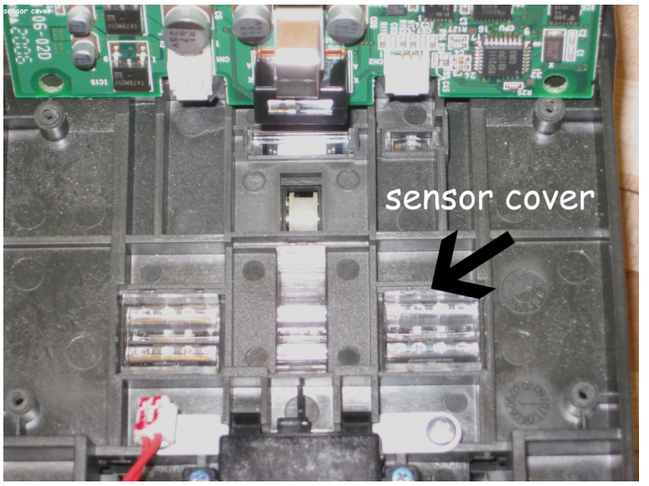
Bally EVO Rebooting Itself

We had a Bally EVO "Black and White Sevens" video game that kept rebooting itself. I thought maybe the main processor was to blame. I replaced it, fired it up, and started setting the options. Part way through the setup, it rebooted itself once again. Well, so much for the main processor being the problem. The CD was checked also. It didn't look scratched and it wasn't very dusty. I cleaned it up, but that wasn't the problem either. A co-worker took a look at the power supply and if I recall correctly, it was rebuilt, and that didn't fix the problem either.

What is left to replace? The A-D board and the backplane board are the two items left to check. For those who don't know, the A-D board on an EVO is somewhat similar to a "brainbox" on an IGT AVP or Trimline. The







board basically consists of a CD drive, USB ports, video port, and a sound port. Maybe this board could be the problem? It was replaced, the game was turned back on and game optioning was started. This time it did not reboot itself. The A-D board was the problem all along. So, if you happen to have a Bally EVO that likes to reboot itself, it may be a bad A-D board. As a reminder, if a tilt doesn't want to clear in an EVO (a reel tilt or a door open tilt, codes 41 and 51) a "change button" nowadays called a "service button" reset may do the trick. Simply power down the game, hold down the button, and keep it held, then power up the game. While keeping it held down, wait until it is fully booted up and the tilt may clear. Once the game fully comes up, release the button.

Technician's trick: You can gently press a small flat head screwdriver into the button assembly to keep it held in place during boot up.

The "button trick" doesn't work every time, but it does work some of the time.

IGT S2000 All 8s on the Display

When called to this game, one of the first things that came to mind was a bad seven segment display. On the display, it showed all number 8s; every segment was illuminated, exactly like a seven-segment display test would show. It tests all of the segments in the unit, each light up, thus showing the number 8. The problem was, it didn't matter which part I swapped out, as soon as power was applied to the game the 8s would re-appear. Obviously the display itself was swapped, then one of the cables that were connected to it. The small cable appeared that it had been pinched and may have a break in it. No luck there though. The main slot door I/O cards are used in conjunction with the display. They were swapped out also.

By now, it is getting somewhat interesting. What is going on with this upright stepper S2000? What is causing the display to show only 8s? Next along the troubleshooting path, I swapped the main processor board with a game of the same program. That way, the errors wouldn't be too severe. I turned on the power to the game, had my expected RAM error, cleared it and sure enough, all 8s appeared once again! The VFD was changed out too and still the same results.

I figured that it was time to call an IGT tech. I wasn't really sure where to go next. I got in contact with one right away and he mentioned that the power supply behind the reels could be the problem. That too was swapped out and I still had a display problem. So thus far, the processor board, seven-segment display, I/O cards, the VFD, the power supply behind the reels and one of the display cables have all

been swapped out. Even the "denom touch panel" had been swapped. What was left? What did I miss? It was the end of my shift with two days off so I had to leave the game shut down. A few days later, I asked a co-worker what was done on the game to get it running again. There was one board that I didn't swap out and that was the problem all along. The answer: the motherboard. As soon as it was replaced and the game turned back on, the display was ok.

Bally "Cinevision" Button Panel Replacement

Conversions needed to be completed on a bank of six "Golden Monkey" games. They are now "N.Y. Gold." In addition to the glass and software, the button panels needed to be replaced because NY Gold required a panel with 14 buttons.

Without instructions and having never torn apart a Cinevision before, the first game took me almost two hours to complete. I'll admit I don't have (well didn't have) much experience with the game until the bank of games was complete. I wasn't TOTALLY in the dark though. I had seen and helped a Bally Tech replace an LCD on one once where the main slot door had to be taken off. I had an idea how to take the main door off but had never completed the task myself.

What is involved in removal of the main slot door on a Cinevision? And why does the door have to be taken off anyway? It has to be removed to install the replacement button panel. To start off, I removed the

door wire harness. The other panel already has it installed so it isn't needed. The harness includes the jackpot reset lock, the bill acceptor and printer bezel wires, and of course the button wires themselves. Other items that are on the main door are the tracking system components: the card reader, display, and keypad. One other item is the "door ground cable." It is a ground strap that grounds the door to the main frame of the game. Once ALL of the cables are removed, there are two door struts that need to be disconnected. I tried to disconnect one from the door end and it was being a real pain so I found out that it was much easier to remove the strut bracket from the game frame, not the door side. After the four nuts are removed (two per side) be very careful not to bump the door or it will fall on your head. If you can, have someone hold the door so it won't fall. The brackets will stay in place with the nuts removed but there is risk involved.

Next, there are two main door locking assemblies, one on each side. Near the door hinge, one per side, there is a small lever that when pulled, will unlock and allow the door to be taken off. It's a pretty neat design. When it is pulled, another lever locks it in the unlocked position. (Notice the lock assembly in the picture?) Before the lever is pulled to unlock it, gently push the door fully open and then downward a bit. This will take some of the tension so it will unlock easily. Once one side is unlocked, simply pull the lever and unlock the other side. Now the door should be ready to be taken off of the game. Lift upward and the door should come out of the frame. The door would also need to be removed to install a replacement LCD if one happens to go bad.

To install the replacement button panel, it is pretty much self explanatory. Remove all of the nuts (there are two different sizes) and remove the six Allen type screws from the armrest part of the door. There are three per side. Once it is disassembled, use a medium size flat blade screwdriver to GENTLY pry off the old panel and then pop on the replacement. Install all of the hardware that was removed, then call for assistance in putting the door back on the game. While you (or a co-worker) are putting the door in place, someone needs to push the door struts back toward the back part of the game. If the door lock assembly is in the locked position and the struts are NOT toward the

back, the door will have to be removed again. As soon as the door is in place, install the nuts on the door struts to hold it in place. Next, connect all of the cables back up such as the jackpot reset lock, the tracking system, and the door ground strap. Also, don't forget to connect the wire harness to the game. There are three connectors. None have the same number of pins so they cannot be mixed up. Double check to see that all of the cables (except a small white two-pin connector) are in place and the game should be ready for the next step of the conversion. It may sound like a lot of work but it wasn't very difficult after the first game was completed.

IGT I-Game - Fort Knox

We recently had some power surges and a three hour power outage. As most of us know, slot machines do not like bad power. This Fort Knox game was shut down after the outage, so more than likely it was corrupt because of power interruption. I thought that I would take a look at it, and it had EPROM errors that would NOT clear. After the third occurrence, it was time to move on to something else. Next, the small "button type" battery was removed from the processor board. After a couple of minutes, it was put back in its socket and the game turned back on. This time, a "RAM error" was displayed. It was cleared, and I started to option the game. Once I thought they were all set properly, a "host validation error" wouldn't clear. Could this be a game option that isn't set correctly or perhaps on the tracking system end? Everything on the Sentinel looked ok, the game interface cable was in place and the Sentinel was communicating with the system. The cable was also plugged into the game end properly; there weren't any pins out of place at all.

Where does the game interface cable socket get its information from? It comes from the backplane board. I haven't run into it in quite a while but as soon as I looked at the ribbon cable that connects between the interface connector and the backplane, the problem was right in front of me. The ribbon cable connection on the backplane board was loose. It was half out of its socket! This would definitely cause a host validation error which was the main problem in the first place! As soon as the cable was properly plugged in, the error disappeared.

UBA Stacker Box Belt Problem

I received a few calls to a game where the slot attendant stated that every time a customer inserted a bill, it would jam between the transport assembly and the stacker box. The third call was enough; something was definitely wrong and the stacker box was empty.

The bill acceptor made the proper "cycle sound" and reset properly. It even lit up. I tried rebooting the game thinking that may help. There weren't any errors showing on the game display. Everything looked and sounded normal. I was told that the transport assembly had already been swapped out, so that part was eliminated. That more or less leaves the stacker box itself that may have a problem. When the handle of the box is toward you, the gear on the left is supposed to turn the two belts that assist in stacking the bills. Once I started to turn the gear, I could see the belts start to move, and then they stopped, even though the gear was still turning. The belts are not supposed to stop when the gear is in motion. Something on the inside of the stacker box had broken such that the gear was not working with the belts, causing a jam between the transport and the box. Makes sense right? If the belts aren't working properly the bill cannot enter the box correctly and the bill pusher can't push the bill in place. We currently have (after a quick count) 52 good spare UBA stacker boxes on the shelf. So instead of looking at why it went bad, I just replaced it. With a spare in place, I haven't heard of a complaint about the bill acceptor thus far. The "gear and belt" problem was a first for me with the UBAs, definitely something to keep in mind next time a bill acceptor jams.

IGT AVP 2.5 Indiana Jones Touchscreen Problem

Have you ever run into a touchscreen problem on IGT's AVP 2.5 cabinet? At the Island Resort and Casino where I work, we have some that have the "Indiana Jones" theme and some that have the "Wheel of Fortune" theme. They are a newer type of game with the widescreen LCD in them. Anyway, I've run into a couple of them that would have touchscreen errors and I had trouble getting it working again. This particular time, it wouldn't clear and we had not one but two IGT techs on site.

After checking connections, trying a calibration, and rebooting the game, I asked one of the techs what the deal could be. He said to check the far left USB connection on the backplane board. Once the main door is open and the "board cover" is taken off, there are USB connections to the right hand side and on the left. As soon as I checked the connection on the left hand side I could see that it wasn't seated properly. It wasn't plugged in all the way. Of course this was indeed the touchscreen connector because I traced it back to the touch controller. Now that the connector was seated like it should be, the touchscreen worked perfectly. The tech also stated that it could be done "hot" and the game didn't need to be shut down for this. He also said that if it didn't work in the particular port that it was in, to try it in a different USB port and it should work. The game simply had a loose connection that was part of the touchscreen cables. Once the cable was seated in its socket, it worked like it was supposed to.

- Pat Porath
pporath@slot-techs.com

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Ceronix, Inc. is offering a two day monitor repair class for Technicians at our facility in Auburn, California. Troy Nofziger will provide you with two days of familiarization and hands-on repair of Ceronix CRT and LCD monitors. Day one will entail CRT troubleshooting, missing colors, monitor shut down, auto bias, power supply circuits and much more! Day two will entail the direct replacement LCD. Including troubleshooting, becoming familiar with our electronic revisions, and lamp replacement.

WHEN

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GAMING STANDARDS ASSOCIATION'S NEW "PROTOCOL CERTIFICATION PROGRAM" GOES LIVE

Manufacturers Can Now Seek Certification; Operators Gain Access to Lists of GSA-certified Devices

The Gaming Standards Association has launched a new program where manufacturers can ensure consistent GSA protocol implementation, and operators can easily search for products that have been tested and certified to meet GSA protocol standards. Under GSA's new "Protocol Certification Program," manufacturers can submit their products for testing certification. A list of all certified products will then be posted to a new page on GSA's website, www.gamingstandards.com, where operators can quickly browse the list in search for products they are considering adding to their casino floors.

GSA's certification program was designed to provide the industry a level of assurance that gaming products correctly implement GSA standards. The primary focus of the program is to ensure consistent implementation of standards to ensure improved interoperability by striving towards "plug and play." The website will list gaming products that have been successfully tested for conformance to GSA standards by qualified testing laboratories.

GSA Technical Director Marc McDermott said, "GSA's certification program was designed with the end-user, the operator, in mind. Through the program, operators can be confident that the products they see listed on the new web page will interoperate with the other certified equipment on the gaming floor. Now with the site, operators can easily verify that the products they are considering putting on their floors are certified to work as intended."

Testing and certification will be conducted by the industry's leading independent test labs. The labs would be individually accredited by an International Standards Organization (ISO) recognized Accrediting Body to the ISO 17025 standard with a GSA scope. Games, systems, peripherals and other devices will be independently tested and certified by these Labs to ensure they operate in accordance with the protocols. The certifications exclusively relate to protocol communications, and are not certifications as required by regulatory testing guidelines.

As products are added, the new certification page will serve as an information clearinghouse where operators can quickly see a list of all gaming devices and systems certified to work on GSA's new Game-to-System (G2S) protocol and on the System-to-System (S2S) protocol.

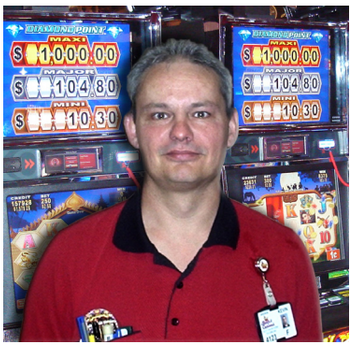
- STM

Slot Tech Training Event

Editor's note: I had me some dang fun at Aristocrat last month, learning about their new Veridian machine from corporate trainer Bruce Wright (left). He has put together a nice service manual and training powerpoint presentation (complete with some really cool animations and video clips). You can download them from the Technical Server at slot-tech.com. They are in the "interesting stuff" sub directory.

From Left to Right: Charles Daly, Dan Thompson (Colusa Casino California) Galen Quinn, Stacy Walker, Ben Tiongson, Garon Martin (Aristocrat Field Service), Pedro Perez (Colusa Casino California)

Slot Tech Feature Article



Kevin Noble's Repair Log

The TPE_RPT REPORT LOG

IGT Video Slant Top

The TPE_RPT report log was introduced to us to help troubleshoot EZ Pay machine problems such as communication problems and games offline on the system. In this case, we had a bank of eight machines. The first two games were Bally slant top Gamemakers, and then two IGT slant top poker machines that mirrored one another on the back side.

We had one of the IGT slant tops that was constantly going on line and then off line in a matter of a second. The funny thing about this one game was the game beside it was the exact same game that included denomination and theme. The only difference between the two games behind it was the denomination but this one game was the only one on the entire bank that was having this problem. We started swapping parts with the game beside it. We started with the fiber cable, COMM board, the Slot Machine Interface Board, the power supply, printer, and I/O card. Each time we swapped out any piece of equipment from the known good game, we would run back to the shop to see if this problem disappeared. We were getting to the point where we were running out of options and we now were looking at a motherboard or a CPU board. We contacted our IGT Regional Representative Wendell Rubio and related the problem with the game and what we did at our end and asked him if he ever heard about this before or had any suggestions. The first question Wendell asked us was the basic question of what was done. He suggested looking at the rainbow colored ribbon cable on the motherboard. He said that he knew it was not the CPU or Motherboard and we did not ask AGCO to come in and remove seals. After hanging up the phone, I dashed out to the machine, swapped out the rainbow colored ribbon cable, ran back to shop and ran the report. It was still acting up. I called Wendell again and told him about the failure. The next question from Wendell was if there was a Bally Game Maker slant top before this machine in the loop. I said "yes."

Wendell said he had a feeling that the LSAM or the UGM could be the culprit as he once heard about this condition from another source awhile back. Wendell agreed to come in and help us troubleshoot his IGT game. We went to the Bally

Game Maker just before the IGT slant top and coupled the fiber to eliminate the entire machine to see if that machine was causing the problem. Fortunately the problem disappeared. We then rebooted the UGM and plugged the fiber back into the Bally game and the problem on the TPE report was still gone. However, tickets were slow to be accepted or not at all so we did a forced download on the CVT for the bank and now everything works perfectly. The problem was logged in my "TECH LOG" because I know I might be seeing this in the future.

Aristocrat Video

Known for the SPCII boards losing communication, this one game acted like every other Aristocrat game that lost its communication. The call from Supervisor stating there is a manual jackpot on the game sends the instant message to the brain the SPCII needs calibration. You check the soft and hard meters and confirm that they are not in sync any more and a calibration is needed to realign the meters. Another Technician then checked the TPE_RPT report in the shop to verify the errors. When you first go into the game, pull out your handy dandy home made jumper wire contraption to jump pins #6 and #7 and clear the SPCII board. Check your hard and soft meters again and close up shop. This time the exact procedure took place described above except for when one of the Technicians got call back to the game about 5 minutes later. This time the SPCII board was not cooperating and would not sync the soft and Mikohn meters. The board was recalibrated a couple of times to realign the meters but the situation was not changing.

We went to the shop and grabbed another SPCII board, placed it in the game, cleared the board, checked the meters and now all things were good, or were they? Later that night it was placed out of service because of the manual jackpots and meters being misaligned. This time we noticed that when you pushed the tray back into position, the lights on the printer would flash light from the top to the bottom like the Christmas tree lights at the drag strip. So we figured out that there was a bad wire that was being pinched when you reseated the tray back into the game. So we checked for any broken or pinched wires we linked to the printer, fiber board, and the Slot Machine interface Board that might cause the printer to now act up. We tested all the wires involved for any with the meters and could not find any breaks in the lines. The weekend approached and the problem was passed on to one of out Technicians who continued on with troubleshooting this problem. When I returned back to work, I asked Gary about the situation and he informed me that he eventually replaced the printer and all manual jack pots and misaligned meters went away. Since then we have not had any problems.

Aristocrat Video Part II

I received a call from the Slot Supervisor stating they just paid a manual Jackpot on an Aristocrat video in the corner and, as just mentioned previously, all the same steps were taken to troubleshoot the problem. We started with SPCII board clear, replaced it with a new board, then we started swapping out parts with the game beside it until almost all of the original game was now in the game beside it. Cross off the list the Slot Machine Interface board, the SPCII board again (just in case), EPROM, and the fiber board. None of that worked but we needed to eliminate all possible leads because changing out the motherboard or CPU required us to have the seals broken and the Electronic Gaming officer present. For peace of mind, we decide to start checking and swapping the wiring until we were left with the motherboard and CPU. With no seals on the motherboard we decided to swap out the board because we did not need the EGO officer. However, the problem remained. We called and had the seals removed to perform a RAM clear and still the same problem arose. Last but not least we swapped the CPU board with a brand new one from the shop and the problem went away. Many steps and procedures were followed to get down to the very last option, The CPU board.

IGT S2000 3 reel

Sometime during the night, a wind storm blew into town and knocked the power out in half the building. When the gaming floor switched to the generator, we had about six or seven games that needed special attention. We were able to get all of them up except for one IGT S2000 reel game that displayed a system error. We were trying to troubleshoot this machine without having the seals broken. Following the machine's onscreen instructions of turning the reset key, holding the diagnostic switch for 2-3 seconds, closing the door, and opening the main door after the game displayed "Call Attendant" the game went back to system error.

Next, we decided that we needed to swap out some parts to see if we could isolate the problem. We started the troubleshooting process by performing a RAM clear and still the same system error loop. The next step was the CPU followed by a RAM clear but to no avail. The legacy board followed by the motherboard was next in line followed by another set of clears but the problem still would not go away. I decided to get in touch with Wendell again to see if he had any suggestion regarding the situation that was being played out on the gaming floor.

He wrote the following: “System Error indicates something is missing in the boot process. It could be software or something in the SENET. Netplex devices are the absolute last item to be called in the boot process because they practically work on their own set of codes to initialize and in some cases the machine can work without them if they are disabled. Now if this is a S2000 5 reel game kind of like the ones I just installed is it possible one of the I/O cards was damaged during this power outage? If everything on the door I/O is OK then start looking at software, possibly the version chip first and then one of the game chips.”

I next swapped out the door I/O card with the game next to it to rule out this possibility however, the same problem still existed. I ordered one complete set of EPROMs for this game to start swapping them out as per Wendell to see exactly who the culprit was. Before the set of EPROMs arrived and during a scheduled visit from Wendell, he recalled a similar situation that happened at another site involving the SNDF card. We decided to remove the DSV42 sound card from the CPU. Replacing the board back in the game without the sound card, the machine allowed us to get into the key chip options. To verify the SNDFDSV42 was the problem, we replaced the CPU board back in the game with the old sound board in it, powered up and a “RAM error” was now being displayed. We reset the “RAM error” with another DSV42 that was removed from a Denver Duck game on the floor that did not require the SNDF DSV42 board. We set all the options, bill and ticket tested the machine, called for the EGO and placed it back in service.

Other Machine Problems

WMS Video Jackpot Party (bad 512 Ram)
1. This machine was stuck in a loop and it kept rebooting itself. In the boot up process it would reach the same page and restart. This condition also occurred when 256 RAM was discovered and inserted in the CPU instead of the 512.
2. When called to the game the machine would not print tickets, no tilt on the game. When you powered up, you would get the message “SYNC over Range.” The CVT had no errors, the printer was swapped and when you tried to print a ticket the error “printer disconnect error” would appear.

WMS Bluebird Reel
1. After morning soft drops, the machine displayed “log error” that we could not clear. We needed a RAM clear to unfreeze this machine.

Atronic e-motion
1. The machine would print tickets that read est-IGT EZ PAY TEST-non Config-test-test. We found

out the fiber board was bad.
2. The game would freeze when going from the option screen back to normal game mode. We found that U34 & U35 were bad on the COMM board.
3. When called to this machine, it was frozen and displaying the message "out of Range." We tried rebooting the machine a couple of times. When we reseated the CPU board, the game came back to life.

Atronic Cashline
1. This machine displayed CB: Bill Table Timeout that we could not clear. When troubleshooting this game and going through the routine of swapping parts between games, we noticed a pin that was pushed back in the BV harness that was not making contact with the BV assembly.
2. When I was called to the game, the machine was frozen with credits still on the machine. Checked the button panels and swapped out the power distribution board but the game needed a RAM clear to it free up. But after four or five times, this same problem kept coming back. We tried swapping out the CPU but the problem still haunted us, so we decided to replace the U2 and U6 and the problem went away.
3. After a RAM clear, we could not clear the "Voucher Text not initialized" error. We force downloaded the CVT and re-polled the terminal address. We decided to set the poll address to another number and change it back to the original address and the machine came back in service.
4. This problem was reported to me about the game having no power, no nothing. The tech unplugged the printer and the entire machine came back to life.
5. We were called to this machine for a door open tilt that could not be cleared. Believe it or not, the Jackpot switch was replaced and the tilt was cleared.

Bally Video
1. In two occasions on different machines, the machine was printing tickets with different asset numbers from different machines. This has happened where we completed a RAM clear on one game and replaced the UGM on another.
2. ROM SIG would not pass, "no results" and "Timed Out" errors reported from Central. We replaced the UGM and the problem went away.
3. On a Bally Gamemaker we could not clear the "Voucher log full tilt" error on the screen and had to perform A RAM clear to get rid of it.
4. On another Bally Gamemaker, the screen only showed the first two games out of a ten game limit. The third game EPROM in the P3 socket was removed and the last six games returned. The new P3 game was ordered, returned, and in service.
5. On a Gamemaker, the game was powered back up after maintenance and the screen was blue. We removed the 1st game EPROM in socket P1 and the other nine games appeared.

Bally S6000
1. This TITO conversion started having hopper empty tilts. After finding a diagnostic switch that had broken apart and was left dangling in the machine (shorting out) it was replaced with a new one and the errors went away. It must have been making contact with the BV, transport or housing.
2. The game would not print out a ticket with poll number on it. After checking the CVT and asking Central Accounting to check the bin file, we did a RAM clear and the problem remained. We next swapped the CPU board and the poll number came back.
3. Another TITO converted game had the hopper running and it would not turn off. The CPU board was replaced and the problem was solved.
4. On the Quarter Millions progressive, the UBA would cycle, the BV light would come on but it would not take in any bills or tickets. This game had the UBA swapped with a known working one but it finally came down to the CPU board being bad.
5. The machine displayed an 88-8 code after an EPROM upgrade. We were going to swap out the CPU board when we were comparing jumper settings and noticed that one of the jumpers for the EPROM size had fallen off. This was repaired and the code went away.

Bally Alpha
1. The machine was looped in the rebooting process. We tried a RAM clear but the problem continued so we replaced the CPU and presto all is good.
2. This was an ongoing problem every morning after drops. "Mechanical reels not configured" was the message that we could not clear. We tried swapping out all five reels one at a time to see if the error would disappear, swapped the reel driver board, and went as far as swapping out the CPU. When we tried swapping out the USB cable, the problem went away.

Aristocrat Video
1. After paying out a manual JP on the game, I was called to the game and noticed the Mikohn and Soft meters were mismatched. I noticed that the Mikohn meters were double what the soft were. In the SPC set-up, I opened the door on the CPU cabinet and cleared the GME EPROM option on the screen. The meters realigned and the game started reporting back to the Cage.
2. Manual Jackpots reported from this game but this time the CVT report in the CC Config reported "Machine Loop Down." We checked the fiber board and cable and noticed the cable had a solid red output instead of the nice pulsating one that we are used to. Believe it or not we RAM cleared the SPC II board and the problem went away.

IGT Video

1. Touch screen COMM failure error was displayed on the screen that would not clear, so we unplugged the P8 and P9 connection to the motherboard, powered the game up until "meter disconnect" error was displayed, then powered down. We reconnected the P8 and P9 connector and the error message went away. I don't know if this is legal or what harm it will do later, but this worked. We also had a bad CPU board cause this same error.
2. Fort Knox progressive bank had Auditing issues; the slot machine interface board (SMIB) kept freezing, allowing the soft meters and Mikohn meter to misalign. Every morning we would verify each game to see if they were equal. When they were not the same, we had to reboot the SMIB board. The JP reporting option had been disabled following a recent upgrade. After enabling the option, all issues went away.
3. The error read "Buffer full validation disabled by SAS." After checking the CVT, we found on the CC Conf report that the machine was displaying a duplicate address. We found another game on the same line with the same poll number. The error went away after changing the incorrect game's poll number back to its original poll number. On another occasion, we cleared this message by performing a force download on the CVT.
4. For the 100th time, a "meter disconnect" error that could not be cleared was the CPU board again, again, and again. Have to teach the Slot Attendant to power down the game before reseating the I/O card when they open the main door.
5. On a Fort Knox, MCB2 lost all its information after a power failure swept through our gaming floor. It was suggested that we re-install the three discs in the MCB2. We had the seals broken and started installing the discs when the third disc would not accept. We called the IGT rep about the situation and he came in with a new MCB2 monitor and the game was back in service.

IGT S2000

1. In a recent machine move with new machines coming in, this one game had no sound. We checked the speaker, wiring and found on the CPU board U82 was mis-pinned. Once reseated, the sound returned.

Mikohn (Sigma Video)

1. The game would freeze up just before loading the sound files after being powered up. We swapped out the DISC-ON chip, performed a RAM clear and the problem disappeared.
2. In the options menu, the configuration tag had no information from the CVT that was displayed on the screen. We changed the poll address to another address, reset the game, went back to that option and set the correct address, closed the door, went back to the configuration tag and all the information was displayed correctly and the game went back in service.

Konami KonXion

1. After a COMM EPROM upgrade on the floor, the machine displayed "maintenance needed" and it did not display any faults. We took a step back and replaced the COMM EPROM with one of the old EPROMS and the game went back in service. A new EPROM was ordered, received, and placed in the game.

Progressive Signs

1. Reading from across the gaming floor was the message DRIVE B that was not stepping through the sign boot up process; it was flashing its three main colors. After rebooting the Supreme board again the sign went back to the exact same spot and locked up again. The Supreme board was replaced and the sign displayed the correct Jackpot.
2. This sign kept going through the options as if the switch was left on the supreme board. The board would start to reboot itself any time you tried to retrieve any information from the controller. The voltage regulator the supreme board was replaced and the sign was all good.
3. On a stand a lone progressive, the 12 cell mini lost its progressive value. The display kept trying to

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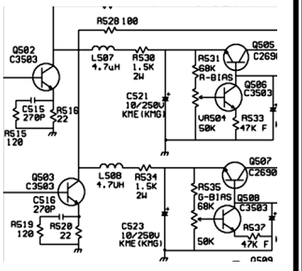

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reboot. It was suggested we try swapping the power supply but the problem remained. We swapped out the driver board and reprogrammed the sign.
4. On a link progressive sign, when the top jackpot was hit, the display would shrink to small fonts but once it was reset, the fonts returned back to normal. The Supreme board was replaced and the problem went away.
5. On an IGT progressive link, the sign would increment correctly, all jackpots were reported to the cage except for the top award. The progressive amount could not be displayed so a manual had to be written up each time. It was later discovered that there was an old existing Bally link progressive there at one time and the IGT harness to the controller was never replaced with the IGT. Once this was swapped out the, Cage received the jackpot amount to the penny.
6. Checking the laptop after loading information from the progressive sign, the display on the laptop would display screen #7, then screen #3, Screen #5, in no order. By pressing F4 on the keyboard button the information soon stopped, displaying the correct information.

CVTs

1. All the games on CVT # 19 on the Gaming floor lit up like a Christmas tree and manual jackpots were everywhere. Next we grabbed the Security escort, went into the CVT room and found CVT # 19 stuck in "waiting for download" mode. After a force download and a RAM clear on the CVT, we asked Central accounting to reboot the entire floor and the CVT came back on line.

AC/COIN

1. After a PM project, one the Little Green Men Jr. game with the little Martian that slides up and down would not move when it was in bonus round. It was suggested the motor control board may be bad, so I ordered the part and replaced the board when it came in but the problem still existed. When looking a little further into this game I noticed that every time the door I/O card was removed the little fellow worked fine. But we all know that you cannot play the game with the I/O card missing. Starting all over I checked all the connections that were removed when the Preventative Maintenance service was done and still no movement. We replaced the CPU board and the little guy continued on moving up and down his perch.
2. On the games that have the big globes with the ping pong balls the LEDs that surround the globe would not come on. We tried everything from the lights, the CPU board, and the motherboard until we started swapping EPROMS from another game. After all the EPROM swapping we started on the little pixel cards and found that when we swapped out PXL 3 card, the lights came back on.
3. On another game we had the infamous "meter disconnect" error that would not clear. Starting swapping parts with the game next to it, door I/O card and CPU just to name a few of the things that were done; we ran out ideas. We decided to swap the complete top globe assembly that consisted of six wing nuts and a couple of connections. When we finally swapped the units and powered back up, both units with their respected games worked fine. We figured that one of the connections was reversed in the game that was acting up.

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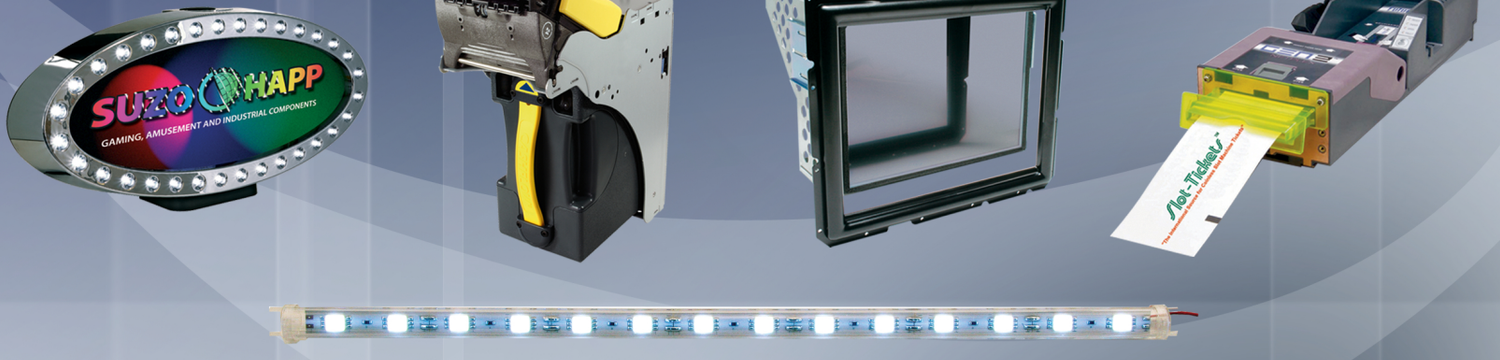

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