

August 2008

SLOT TECH MAGAZINE

Slot Machine Technology for the North American Gaming Industry



MK5PFC
Circuit Analysis



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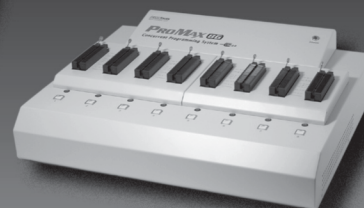
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OK. I love cheap tools that really work and are a ton of fun to use. CI Innovations has a really cool CCFL tester that you just have to get for your shop. Basically, it's a piezo-electric inverter that will drive just about any CCFL of any size. Just hook up the CCFL, turn on the switch and watch the lamp light up (if it's good, that is). You can easily tell if the lamp is good by looking at the quality of the light.

It's also a lot of fun to play with. During the recent

TechFest, I had a chance to play with some of Ceronix's replacement CCFLs, hooked up to the CI Innovations unit. During the process of shocking the heck out of myself, I discovered that you can have fun lighting up a CCFL with just one wire hooked up, using your fingers and other body parts as the return path. High frequency, high voltage electronics is a whole different world. Maybe it's time for me to build another Tesla coil.

You would be nuts to not have this \$55 tester in the



Randy Fromm

shop. There is nothing else available that does this.

A handwritten signature of Randy Fromm in black ink.

Randy Fromm - Publisher

Randy Fromm's Slot Tech Magazine

Editor

Randy Fromm

Technical Writers

Ted Befus, Kevin Noble,
Herschel W. Peeler, Pat
Porath, Vic Fortenbach,
James Borg

International Contributor

Martin Dempsey

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New product announcement from CI Innovations Inc

The world leader in CCFL lamp products for the gaming industry



We are proud to announce our new Cold Cathode Fluorescent Lamp (CCFL) Bench Top Test Unit

This is a 110 volt AC powered unit and comes with a pre-connected AC cord with plug and an in-line ON/OFF switch.

All you have to do is plug in a CCFL lamp and turn on the Bench Top Test Unit to see if the cold cathode lamp will light up or not. It saves a lot of guess work and gives you a quick starting place when trying to find out why the LCD in your monitor is not lighting up or is dim or pink in color.

Basically this bench top tester will save you time by giving you the ability to check that the CCFL lamp lights up before you put it back into the LCD panel. It also gives you the ability to check to see if it really is the CCFL that is bad, if you have a suspect CCFL lamp and you are able to check it and it lights up then you know that it is not the CCFL lamp that is bad.

Every Slot Tech shop should have one, especially since most of your cabinets come with some sort of LCD monitor in them no matter who the manufacture is, and our Cold Cathode Fluorescent Lamp (CCFL) Bench Top Test Unit can power any size lamp from 1 inch to 36 inches, and has built in voltage surge protection. The cost of this unit is \$55 and by purchasing it gives you a valuable tool in helping you service your LCD monitors.

To order or for additional information contact Harry Iversen at CI Innovations Inc.

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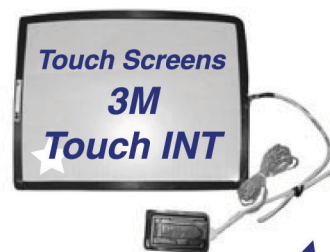
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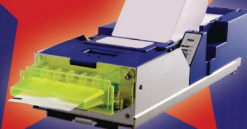


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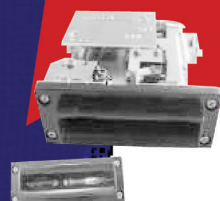
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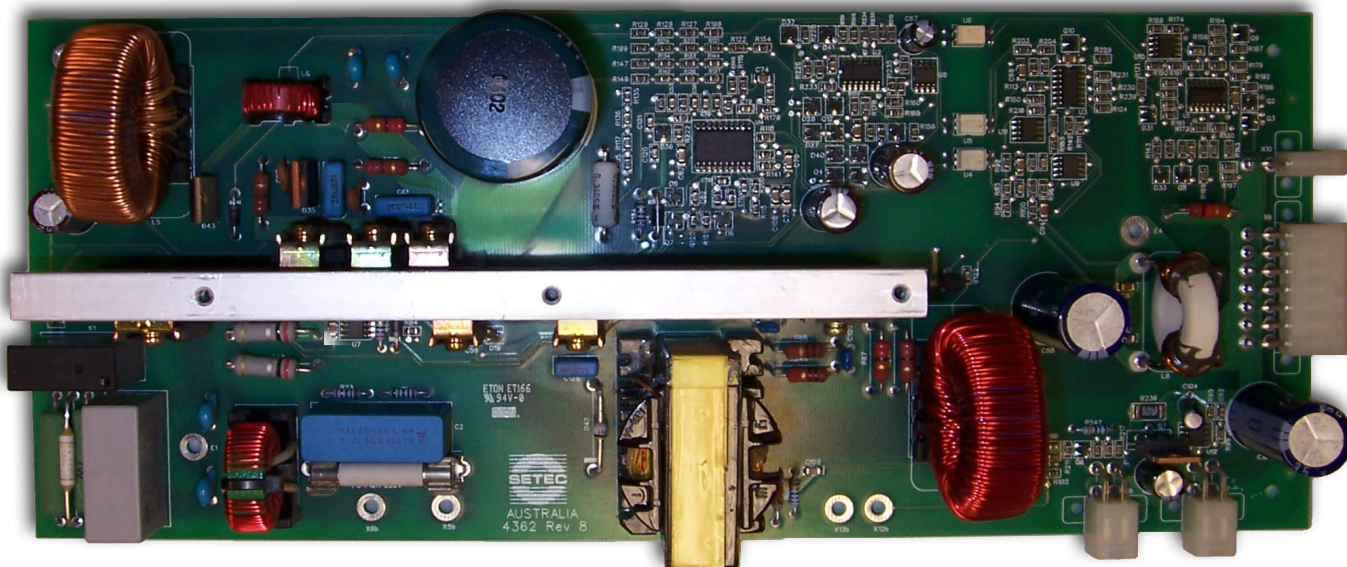
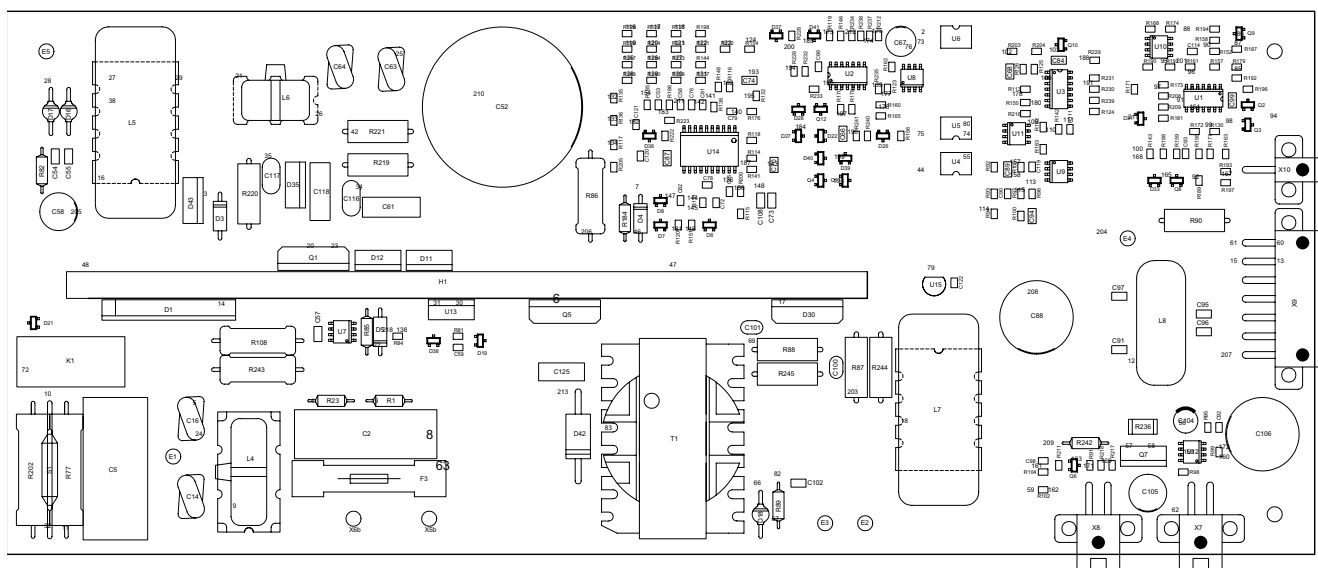
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SETEC MK5PFC Circuit Analysis Part 1

The SETEC MK5PFC power supply is one of the most complex power supplies we see in the gaming industry. It incorporates the latest advancements in modern power supply design including Power Factor Correction and DC to DC conversion. Add to that some very gaming-oriented features such as the ability to control the

fluorescent lamps or shut down the monitor and you begin to see its complexity. Top it all off with over-current protection and over-voltage protection, sprinkle a little temperature control on top and you have a complex system that quickly reminds you that there are still some very interesting analog circuits in this mostly digital world.



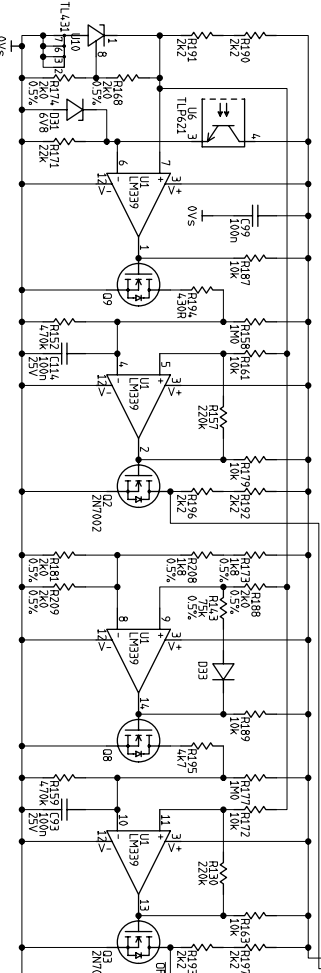
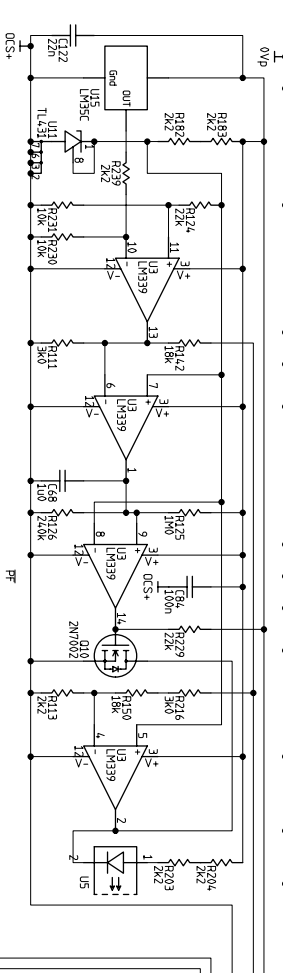
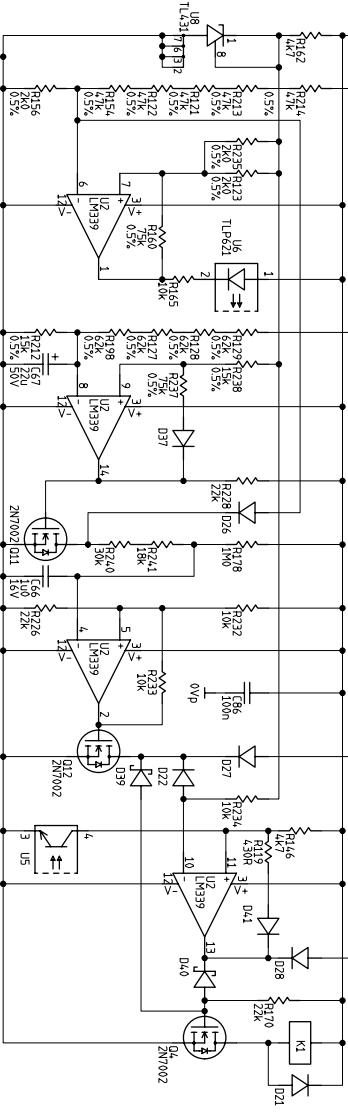


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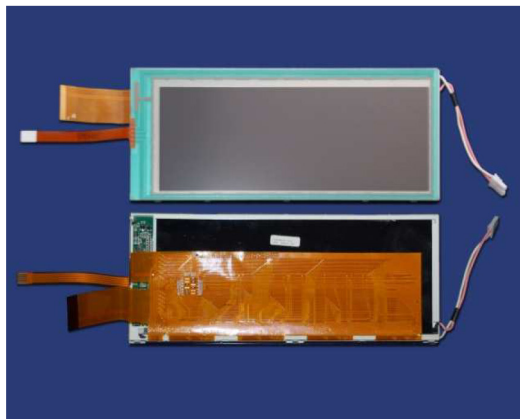


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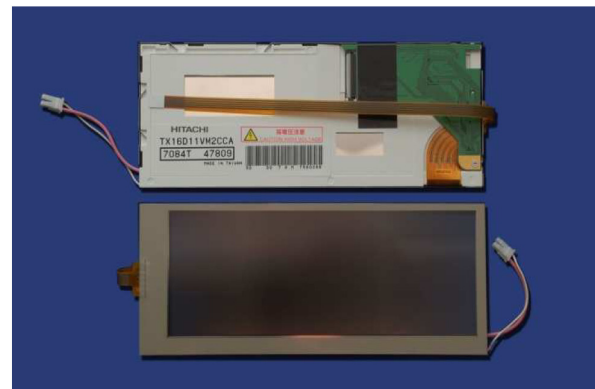
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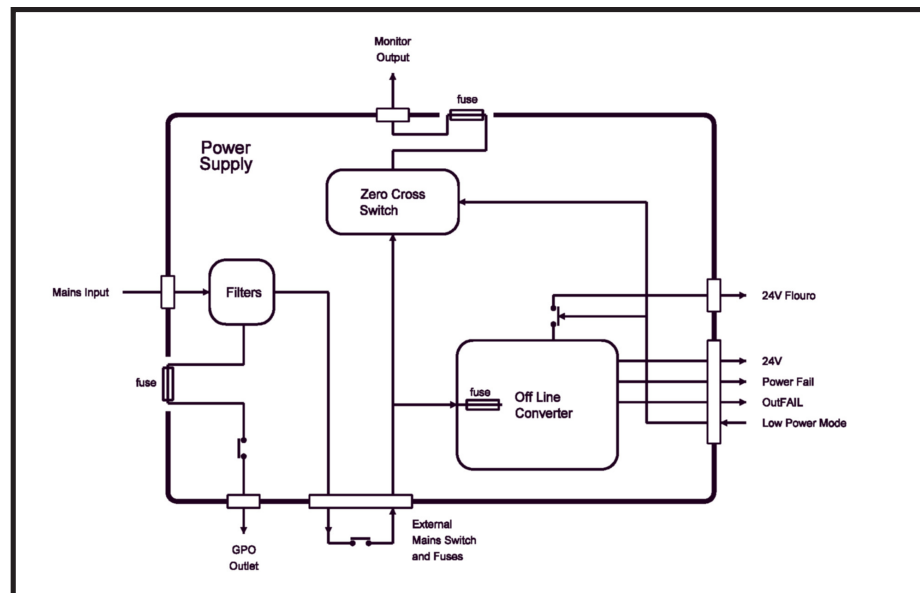
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AC (mains) Input Filtering and Monitor Control

Switched-mode power supplies are noisy. They generate a lot of electromagnetic interference (EMI). Like all modern power supplies, this one starts off with an EMI filter on the mains input (Although we don't use the term in North America, in the rest of the world, household AC current is referred to as the "mains."). This filter system lives on the appropriately named "Filter Board." It is comprised of a network of capacitors and an inductor (C1-C6, L1) and prevents EMI from escaping the power supply and taking a free ride on the mains where it might wreck havoc on the rest of the system. It doesn't actually change the AC current in any significant way.

R8 is a varistor, the self-sacrificing surge protector that absorbs the energy from things like lightning strikes and freak power surges. If you see that it has blown up, you will naturally have to replace it.



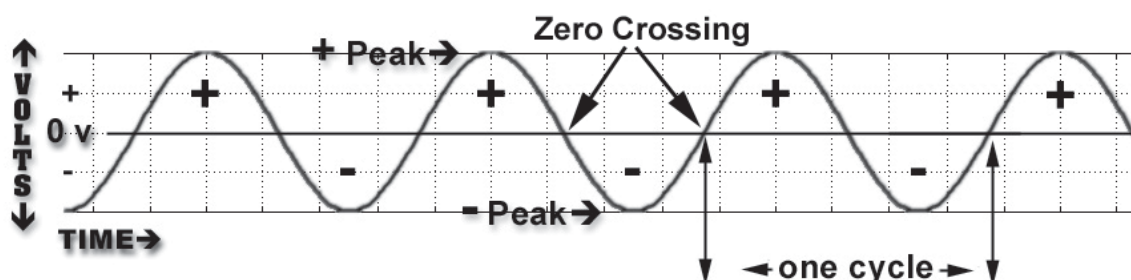
But don't think badly of it. Don't think it failed. It likely was just doing its job. You might want to look at everything else plugged into the same power source. It's usually a one-shot device. If it's blown open, you might not even realize it because it did its job and the game still works perfectly. However, you've lost a layer of protection and the next hit will likely be fatal (and maybe costly).

From here, the AC current passes through fuse F2 to the female mains connector. This is an unswitched mains outlet. At the same time, a double pole, single

throw mains switch completely isolates both the hot and neutral lines when it's in the off position. When the switch is in the on position, it applies the mains to the Main Board of the power supply through yet another line filter circuit, this time comprised of coils L2 and L3, and capacitors C7-C11. It also applies power to the monitor but not directly.

Zero-Crossing

Before applying AC power to the monitor, the AC current passes through a "zero-crossing" circuit made from U1 and a TRIAC.



The "zero-crossing" is the instant in time that the voltage and current are both zero. By switching only during this time, AC loads such as the monitor can be safely connected to the mains without excessive inrush current.

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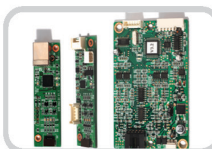
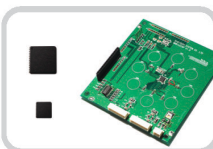
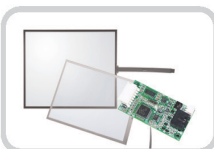
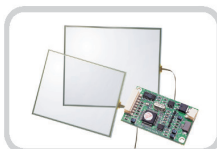
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EST Capacitive Touchscreen surface with protective hardcoat enables scratch and contaminant resistance to dirt, dust, liquid, and corrosive chemicals. With this transparent protective overcoat that minimizes the reflection and maximizes the light transmissions, DigiTech's EST Capacitive Touchscreens provide dramatic physical robustness.



A zero-crossing circuit assures that the only time that the monitor will actually make the connection to the mains is when the instantaneous voltage of the mains is precisely zero. At that exact moment in time, there is no current flowing through the mains and the monitor can be connected safely without causing excessive inrush current or freaking out the degaussing circuit in a CRT monitor. Essentially, it's like the difference between hot plugging something and not hot plugging it. If the monitor's power is connected only when the voltage is zero, it can ramp up slowly as the sine wave voltage increases. It's a much nicer and less destructive way to turn things on and prevents things like fuses that seem to blow for no reason or destruction of input rectifiers.

At the heart of the zero-crossing circuit is the zero-crossing detector itself, an MOC3083. The MOC3083 consist of a normal, infrared light emitting diode that's optically coupled to a detector. Sounds like a normal opto-isolator, doesn't it? It would be except that on the same little silicon chip that contains the photo-detector, there is a bit of circuitry that detects the zero crossing and gates the TRIAC (labeled D1 on the schematic but that's an odd designation for a TRIAC) with an output from pin 6 only at the moment of

zero crossing.

The rest of the monitor's mains control circuit is straightforward. The hot side of the AC power passes from pin 2 of the mains switch, through fuse F1 and, when gated, through the TRIAC to the monitor receptacle. The neutral connection is between pin 1 of the mains switch and the monitor receptacle.

But this so-called "Filter Board" has another function as well and it's really important to realize that the monitor power is not only controlled by the zero-crossing circuit but that the zero-crossing circuit itself is controlled. It is controlled by the all-powerful "Low Power" signal that comes from the game itself.

The Low Power signal is an active low signal that

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The MOC3081, MOC3082 and MOC3083 devices consist of gallium arsenide infrared emitting diodes optically coupled to monolithic silicon detectors performing the function of Zero Voltage Crossing bilateral triac drivers.

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
INPUT LED			
Reverse Voltage	V_R	6	Volts
Forward Current — Continuous	I_F	60	mA
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Negligible Power in Output Driver Derate above 25°C	P_D	120 1.41	mW mW/ $^\circ\text{C}$
OUTPUT DRIVER			
Off-State Output Terminal Voltage	V_{DRM}	800	Volts
Peak Repetitive Surge Current (PW = 100 μ s, 120 pps)	I_{TSM}	1	A
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	150 1.76	mW mW/ $^\circ\text{C}$

TOTAL DEVICE

Isolation Surge Voltage ⁽¹⁾ (Peak ac Voltage, 60 Hz, 1 Second Duration)	V_{ISO}	7500	Vac(pk)
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	250 2.94	mW mW/ $^\circ\text{C}$
Junction Temperature Range	T_J	-40 to +100	$^\circ\text{C}$
Ambient Operating Temperature Range ⁽²⁾	T_A	-40 to +85	$^\circ\text{C}$
Storage Temperature Range ⁽²⁾	T_{stg}	-40 to +150	$^\circ\text{C}$
Soldering Temperature (10 s)	T_L	260	$^\circ\text{C}$

1. Isolation surge voltage, V_{ISO} , is an internal device dielectric breakdown rating.

For this test, Pins 1 and 2 are common, and Pins 4, 5 and 6 are common.

2. Refer to Quality and Reliability Section in Opto Data Book for information on test conditions.

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MOC3083*
[IFT = 5 mA Max]

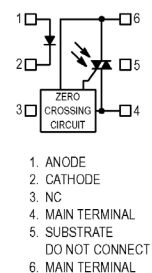
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comes from an open collector output on game itself. When the signal is low, it turns on the LED in the opto-detector-zero-crossing-IC-thingy, activating (gating) the TRIAC and turning on the monitor. The bottom line is this, if this signal is not active, your monitor will not have AC power. Neither will the florescent lights but more about that later.

Inrush Current Limiting

From the filter board, the mains is connected to the AC input of the main board of the power supply. After passing through Fuse F3, the AC passes through yet another line filter (L4 and associated capacitors). Now it's time to apply the AC to the input rectifiers—or is it? Not quite yet. One of the manufacturer's specifications for this power supply (driven by OEM requirements, I assume) is that the inrush current be less than 25 Amps peak when turned on at either 120 Vac or 240 Vac. In order to help accomplish this, the MK5PFC uses a couple of series resistors and a relay to achieve a two step, "soft start" procedure.

When power is first applied to the unit, relay contact K1 is open. You can see that the contact is drawn on the schematic in its "normally open" position. The AC input must pass through two, high-wattage, ceramic, wire wound resistors (R77 and R202, each 9.1 ohms, 7

watts) before it reaches the bridge rectifier, D1 (although I suppose it would be more precisely correct to say that the resistors are actually in the return path, between the bridge and the neutral side of the AC line and that the AC current passes through Fuse F3, through the line filter to the top side of the bridge and returns through the resistors to neutral).

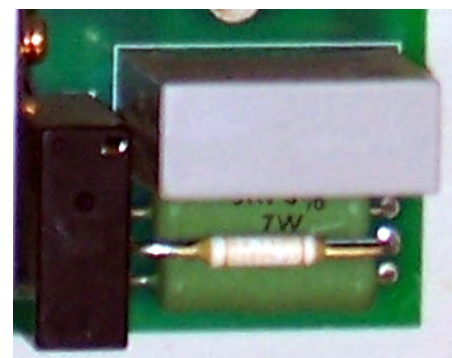
However you want to look at it, there is a total of 18.2 ohms of resistance in series with the AC input, limiting the AC current to less than .5 Amp before the 7 watt dissipation rating of the resistors is exceeded.

The concept is this: Power is applied to the unit. At first, the current-limited power is applied, activating the power factor correction circuitry which, as you will read anon, controls the charge rate of the primary electrolytic capacitor, the main culprit in the generation of both high inrush current and third harmonics, a pair of nasty phenomena we can do without, thank you very much.

After a few seconds, when the primary filter capacitor (C52) is fully charged and everything has stabilized, relay K1 energizes "<click>" and the resistors are bypassed by the relay contact. The mains is now connected directly to the power supply which then proceeds to connect power to the

loads such as switching on the monitor AC and the +24 Vdc outputs for the florescent lamps. Please keep in mind that the game circuitry has ultimate power through the Low Power signal and that the loads will not be energized until the signal is pulled low.

Also notice that there is a 130 degree Celsius thermal switch (S1) in series with the resistors as well. It opens at 130 degrees Celsius. That's 266 degrees Fahrenheit. The thermal switch is visible in the lower left corner of the PCB. It is physically mounted directly on top of the two inrush current limiting resistors, R70 and R202. It's a safety. If the power supply doesn't fire up immediately and energize relay K1, these resistors will get hot. If the temperature exceeds 130 C, S1 opens and the current flow stops. Keep this in mind when you're troubleshooting. If these resistors are hot, don't assume that something is shorted on the AC input, drawing too much current through the



The two inrush current limiting resistors with the 130 degree thermal switch mounted on top.



On-Site Slot Tech Training Customized Classes Available

Randy Fromm's Casino School is a practical, no-nonsense look at how gaming machines work and how to repair them when they don't. **No previous knowledge of electronics is required** to get the most out of the school. The Casino School is geared for those who want to learn how to fix gaming devices without having to learn complex electronic theory or purchase expensive test equipment.

Be prepared for six hours of accelerated learning each day. Class begins at 9:00 am sharp each day and continues until 4:00 pm. The Casino School provides each student with reference materials and troubleshooting guides that will be valuable aids for repairing equipment on location and in the shop.

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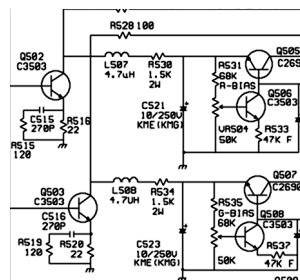
This relatively inexpensive piece of test equipment is easy to operate. Casino School students learn to use the digital multimeter to perform tests and measurements that will pinpoint the cause of a failure down to a single component.

ELECTRONIC COMPONENTS

The individual components used in games are introduced. Parts such as resistors, capacitors, diodes, potentiometers and transistors are covered individually. Students learn how the components work and how to test them using the meter.

SCHEMATIC DIAGRAMS

Schematic diagrams are the "blueprints" for electronics. Learning to read schematics is easy once you know how the parts work!



POWER SUPPLIES

Power supply failure is a common complaint in many different types of systems. Power supply failures are discussed during the class, along with shortcuts for troubleshooting and repairing them.



CRT and LCD MONITOR REPAIR

The monitors used in video slots are designed for quick, easy, and safe repair. Students will learn the theory of operation of all types of monitors and how to repair monitors down to the component level. Of course, monitor safety will also be discussed.

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resistors. ANYTHING that prevents the power supply from energizing relay K1 (and that's just about anything that fails in the power supply) will result in these resistors getting hot.

Power Failure Detection

Before we leave the AC area and enter the DC world, look back at the top of the line filter L4 and find diode D3, a common 1000 volt, 1 amp 1N4007. This is the start of our "power fail" detector. It is connected to the hot side of the mains and passes half the AC cycle through a string of voltage dividing resistors to a comparator circuit that we'll look at later on. If the comparator sees a single missing cycle or even a few cycles, it will do nothing at all. However, if the power really has failed (perhaps a half-dozen missing cycles) it generates a PFAIL signal. This signals the game's computer which then does all the housekeeping necessary to retain the integrity of the game prior to the imminent loss of power. The power supply itself will remain operational long enough to accomplish these tasks (even to the point of operating the mechanical meters). It does this by virtue of the energy stored in the primary filter capacitor, extended by instantly shedding loads such as the florescent lamps. This is one smart power supply and it does it all with analog electronics as you'll see

later.

To the Bridge and Beyond

We have finally made it to the bridge rectifier, D1. Of course the bridge rectifies the AC input, turning it into full-wave, pulsating DC. Following D1, we find a departure from traditional power supplies. The primary filter capacitor is not connected immediately following the bridge rectifier as we have seen in all power supply designs of the past. Instead, a power factor correction circuit is inserted between the output of the bridge rectifier and the primary filter capacitor, C52.

Let's follow the positive output of the bridge rectifier and see where it leads. There are two paths here for the current to flow. One path passes through diode D43 and then to C52. But why do we need the diode? It's already DC, isn't it? Sure it is. It's the output of a bridge rectifier and bridge rectifiers turn AC into DC. Is the current being "double-rectified" or something? Seems mysterious, doesn't it?

The answer lies down the other path so let's go back to the positive output of the bridge rectifier and follow it straight across to coil L5. This is a large toroidal coil. From the right side of L5, we can follow the current path through diodes D12 and D11 and then to the

positive lead of the C52, the primary filter capacitor. What is going on here? Why are there two paths and why do we have the "extra" diodes?

Harmonic Currents and Active Power Factor Correction

If you're a regular reader of Slot Tech Magazine, you know all about harmonics and switched-mode power supplies. You know about the power-sapping third harmonic and how it robs your casino of power. If you need a refresher, the topic was covered extensively in the August 2004 issue.

Harmonic currents are a direct result of the way in which a switched-mode power supply (SMPS) draws current from the system. The input circuit of an SMPS is a bridge rectifier that changes the 120 volt AC input to DC. A capacitor smoothes this DC to eliminate voltage ripples and the resultant DC bus has a voltage of about 170 volts when the AC rms input is 120 volts. Although the AC voltage is a sine wave, the rectifier draws its current in spikes. These spikes require that the AC supply system provide harmonic currents, primarily 3rd, 5th and 7th. These harmonic currents do not provide power to the SMPS, but they do take up distribution system capacity. The principal harmonic current is the 3rd (180 Hz) and the amplitude of this current can be equal to or

even greater than that of the fundamental current.

We solve this problem with power factor correction. Look at the circuit made from MOSFET Q1 and its associated driver, U7. It kind of looks like it is its own SMPS, doesn't it? However, the drain of the MOSFET is connected to the big toroid coil, L5. What's this all about?

This, my friends, is a tricky little circuit called a "boost" power supply. In this case, it's more specifically called a "follower boost." We are using the coil's ability to store energy, not as a charge (as we do with a capacitor) but in the form of a magnetic field.

Our goal here is to change the way the monitor's filter capacitor draws current from the bridge rectifier and, subsequently, the AC (mains). We're looking for a way to boost the pulsating DC output of the bridge rectifier so that instead of charging the filter capacitor with narrow, harmonic-producing spikes of current, we have a steady flow of current flowing from the bridge rectifier into the filter capacitor.

We accomplish this feat by pulsing MOSFET Q1. When Q1 is turned on, current will flow from the positive output of the bridge rectifier, through L5 and through Q1 to the high voltage return path at the negative side of the bridge rectifier (not technically "ground" in this case as the entire primary side is isolated, as usual, from the secondary). The coil is our load and it builds up a nice big magnetic field. When Q1 is turned off, the magnetic field collapses. This rapidly collapsing magnetic field slices across the coils of copper wire and turns the coil into an electric generator in a process called "induction." This newly generated voltage (you can kind of think of the coil as a battery for this moment in time) is now in series with the output of the bridge rectifier and, just like two or more dry cell batteries in series in a flashlight, the voltages are added together. It's called a "follower boost" cir-

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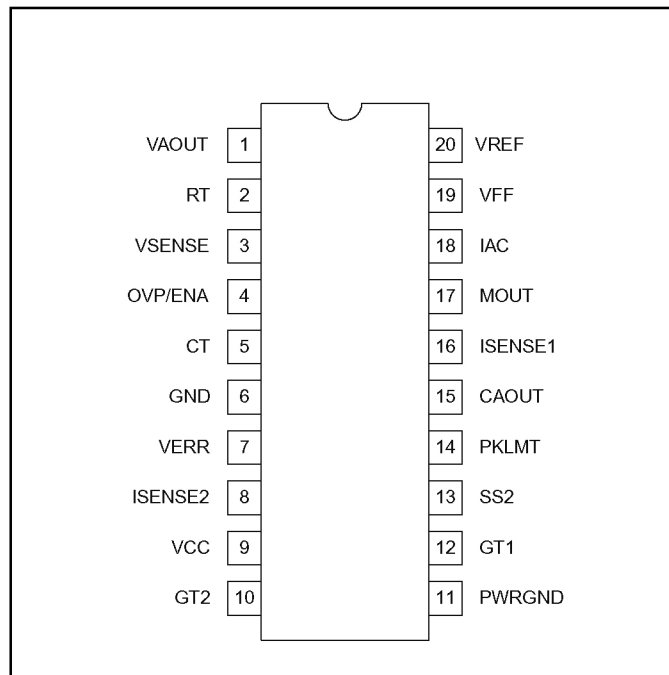
cuit because this newly generated voltage is added to the incoming voltage. If the incoming AC rises, the boost follows along, rising as well. We don't care about regulating the voltage at this point because we're going to do that next with the PWM part of the SMPS.

The result is that we are taking a sine wave in and producing a constant voltage out and the upshot of this whole thing is that instead of charging the filter capacitor only during the brief peak period of the AC sine wave, we can keep a constant charge on it and substantially reduce (or eliminate altogether) the third-harmonic content of the system. This is known as "active power factor correction" or PFC.

The diodes we were talking about at the beginning of this discussion (D11, D12 and D43) are a sort of electronic "anti-siphon" valve. They are used to ensure that the current doesn't "backflow" when, for example, the output voltage of

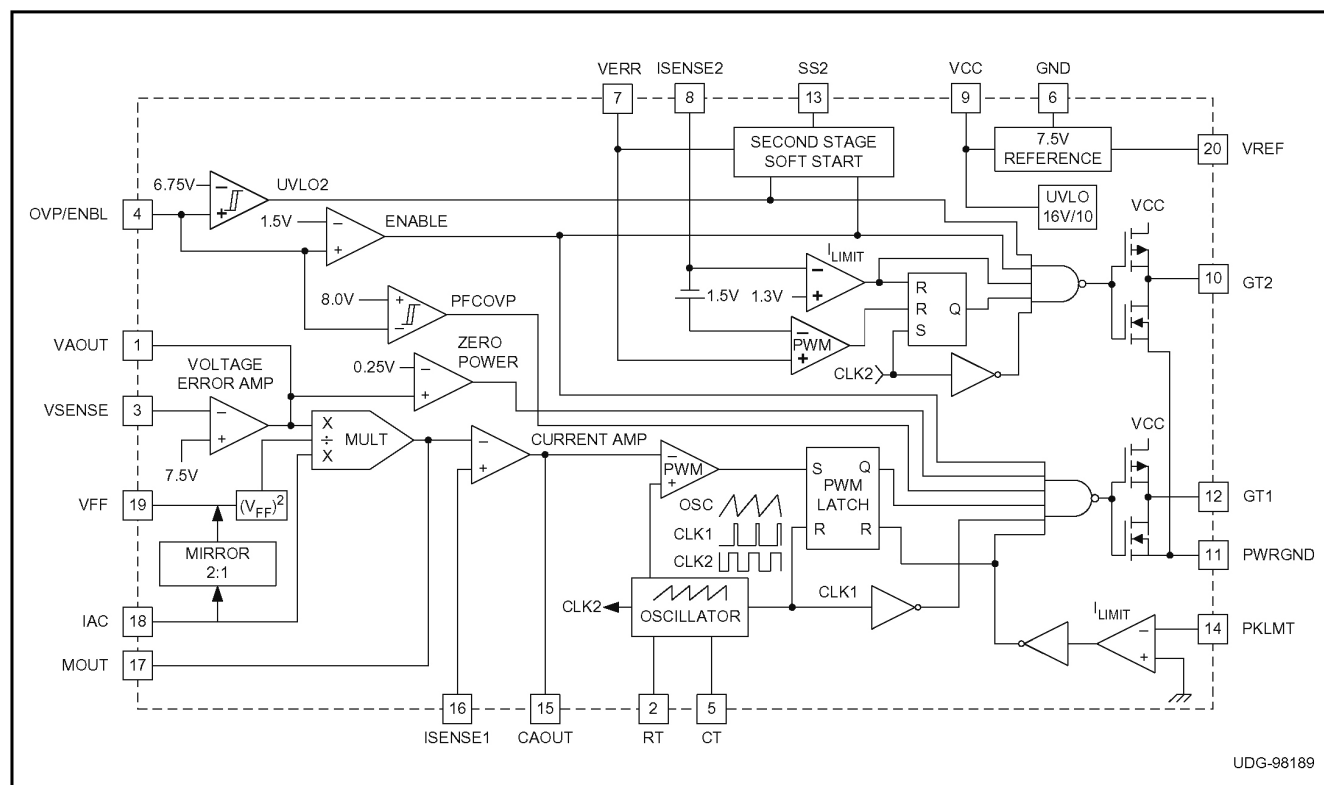
the boost follower circuit is higher than the output voltage of the bridge rectifier.

The "brains" of the outfit is the UCC38503 combination PFC/PWM controller IC, U14. Because modern



BLOCK DIAGRAM

UCC38503 PFC/PWM Controller



power supplies often include active PFC, this IC simply includes both PFC and traditional PWM technology in one package. On the PFC side, the UCC38503 samples both the pulsating DC output of the bridge rectifier and the voltage at the positive terminal of the filter through a couple of resistor voltage divider networks. You'll see a lot of these in this power supply, where an extremely high voltage (as high as +400 Vdc on the primary) is passed through a divider network of five or seven resistors in order to cut the voltage down before applying it to the low voltage input of a voltage comparator or other IC such as this one. In this case, the voltage sense input is pin 3. Pin 18 checks to see what's coming out of the bridge rectifier. The UCC38503 figures out what to do based on these inputs and in turn, sends an output from pin 12 to U7 which in turn controls Q1, turning it rapidly on and off, alternately storing and releasing energy in L5 in order to maintain a smooth flow of current into the primary filter capacitor, C52.

Are You High?

Yes. Very high. I am speaking of course, about the voltage on the primary filter capacitor. The schematic diagram pegs it at +400 Vdc. Of course, we're eventually going to cut that down to +24 Vdc. That's the

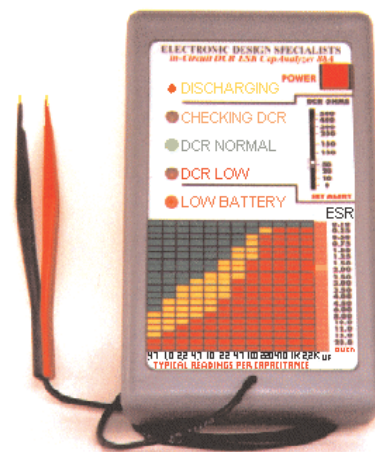
output voltage of the unit. But before we move on to the secondary side of things, there is a very important aspect of this design that needs to be pointed out. U14, the UCC38503 PFC/PWM Controller needs a power source before it can do anything at all. So does the MOSFET driver, U7. Nothing's going to happen unless we get power to these devices. At the moment, our only DC supply is the +400 Vdc at the positive terminal of the primary filter capacitor.

To accomplish this task, we have a power supply within a power supply here. It's a remarkable little high voltage, three terminal linear regulator (U13, a type VB408) that takes the +400 volt, unregulated voltage at the primary and regulates it to an output voltage that can be anything between

+1.25 Vdc to just 30 volts below the input voltage. In this case, we can create a nice regulated power supply of +13.25 volts DC by pegging the reference voltage at pin 1 with a 12 volt Zener diode, D38. The output of the device is 1.25 volt higher than the reference input at pin 1. The output current is limited to just 40 milliamps but it's enough to power the few low voltage things we need to operate before the main power supply output comes on line, specifically U7 and U14 as well as an LM339 Quad Comparator (U2) and the relay, K1 (remember the inrush current limiting system and the relay contact that bypasses the resistors? All of that has to operate BEFORE the power supply kicks in!).

Next Month: Secondary, Sensing and Shutdown

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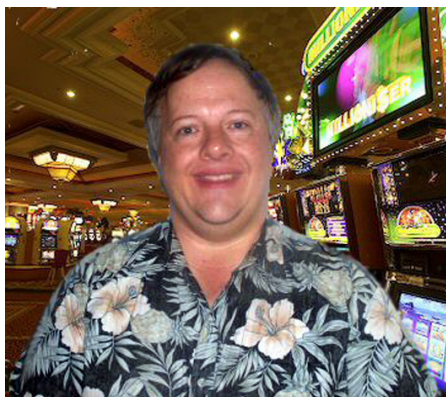
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LCD monitor and Touch Screen Storage System

By Vic Fortenbach

Flat LCD monitors are quickly replacing the curved CRT monitors on the casino floor. There are many benefits of LCD verses CRT monitors, including excellent picture quality, lighter in weight and that they require far less storage space. A flat LCD takes up less than half the space of a CRT monitor. But with this space savings comes a new issue: LCD screens and their accompanying glass touch screens tend to be more fragile (a lot more fragile) than their counterparts. With most CRT monitors, the electronics are protected by a metal chassis frame that covers and protects at least three sides of the monitor, not to mention the thick front of the CRT. LCD monitors do not have that luxury. On the back side of a typical LCD monitor are fans, fuse holders, connectors, adjustment controls and touch screen control boards, all exposed and prone to dam-

age. On the front side of the monitor is a fragile glass touch screen that can be easily smashed or scratched. Both sides of an LCD monitor can easily be damaged or broken if not protected properly.

One basic minimum protection method for the touch screen side is to tape some cardboard or a foam sheet to the front of the monitor to protect it but protecting the back side of the monitor is another challenge to consider. One of my least favorite ways to store an LCD monitor is to try to

balance several LCD monitors on their thin edges or sides on a shelf, like a book. It's a problem because you have to keep other LCD monitors from coming in contact and damaging one another. Even if the LCD monitors are arranged like books, the chances of an LCD monitor getting damaged when it's placed on the shelf or when it's removed is increased. This action is what actually damages an LCD monitor, not just sitting on the shelf. It's hard to not scrape any edge of a monitor and possibly the touch screen when



you are looking for the right monitor that is among several others.

What is needed is a way to store an LCD monitor properly on a shelf that will not damage the front side or the back side of the monitor. One day, while I was eating lunch in the team member dining room, a LCD monitor storage idea struck me. On the menu were submarine sandwiches. These sub sandwiches were piled high with layers of meats and cheeses. Since LCD monitors are flat and relatively thin, why not stack the LCD monitors much like a sandwich? The meat could be the monitor and the cheese is the shelf. Stacking LCD monitors on a specially built shelf system could protect the front touch

screen as well as the back of the LCD monitor. Monitor Identification would be easier too. You could store two or three LCD monitors in about the same space as a curved 19" CRT monitor.

Returning from my lunch break, I thought of basic ways to create this type of LCD storage system. First, measure the thickness of some spare LCD monitors to get an idea of your average shelf spacing. Drawing out the measurements on paper will let you visualize how the shelf spacing will look before you spend time actually doing it. Also, figure out how many shelves you will need. LCD monitors for WMS games tend to be the thickest with about four inches shelf spacing being required.

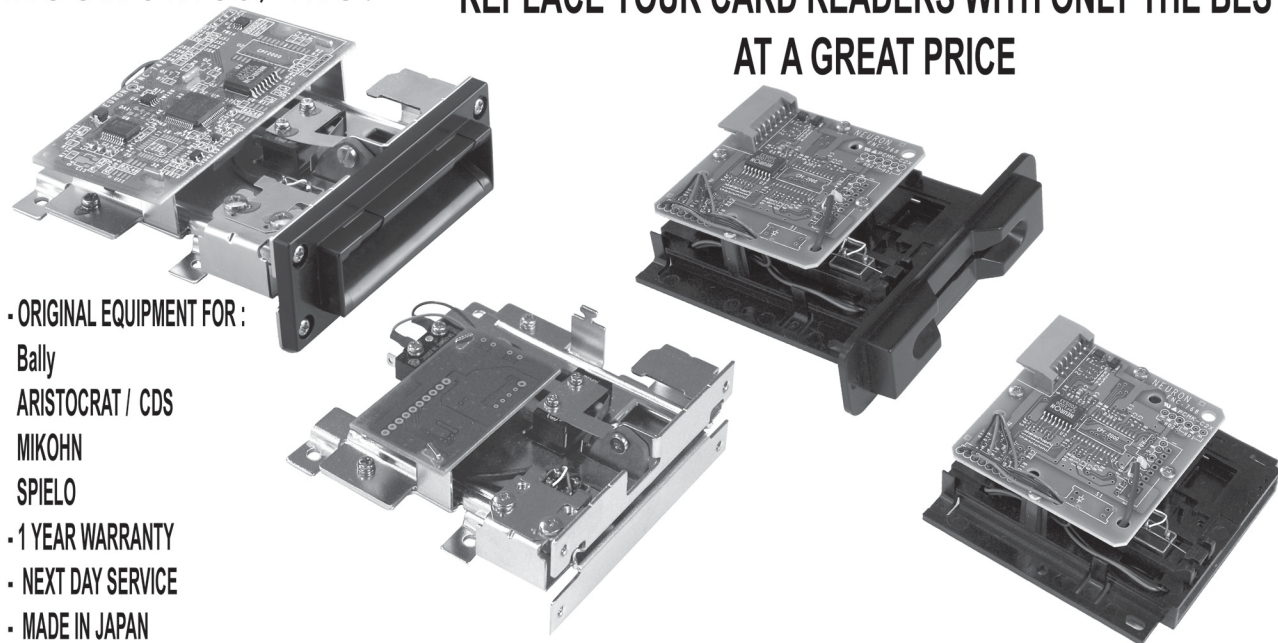
Bally, Aristocrat and some other LCD monitors require a thin two inches. Of course, you will still have to allocate some room for the larger LCD monitors in frames that remain the basic size of the CRT monitor. These types of monitors can go below the LCD monitor shelf area, near the floor.

Arrange the metal shelves to your measurements. Allow some extra shelf space areas for new LCD monitors you may be receiving. You do not want to keep moving shelves around to accommodate LCD monitor stock changes. Like a sandwich, arrange the shelves so you can store LCD monitors easily, and safely. Most slot repair shops already have

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the ideal shelving unit for parts storage. Just purchase additional metal shelves to add to the existing metal shelves you already have. Be sure to also purchase the special corner brackets used to hold the new shelves in place as this makes this LCD storage shelving idea a reality. If you do not have extra metal shelves, wood shelves can be substituted and cut to size to be used instead of or together with the metal shelves. The wood shelves should have a smooth melamine or Formica finish to minimize damage to the monitor. This type of shelving wood is available at any of the larger home improvement stores. The home improvement store will cut the wood to size for you for a small charge. Wood screws and /or angle brackets can be used to mount the wooden shelves into the existing shelving units' upright angles. You can store an average of two LCD monitors on each four foot shelf but some larger LCD monitors will take up the whole shelf. Keep the lighter LCD monitors near the top and the heavier ones near the bottom. Since most slot repair shops already protect the flat LCD monitor front with a piece of cardboard or foam, its safe to place the monitor flat side down, on the shelf. Do not place a monitor on the shelf, touch screen side down without some kind of protection, you will surely scratch the delicate glass touch screen.

It's important to label the shelf for a specific monitor. That way, when a monitor is removed for use on the slot floor, the repaired monitor has a place to return. It also makes monitor inventory easier. The label should describe the slot machine that the monitor is for and not the LCD manufacturer. You can label the individual monitors instead of the shelves but with that idea, any monitor received (bad or good) needs to be labeled. The idea of labeling each monitor only works until the monitor is used. You still need a specific location for the specific monitor.

Once you have figured out the proper shelf areas for your LCD monitors, leave one additional complete shelf area for a replacement touch screen storage area. Like LCD monitors, touch screens have special storage requirements too. In

our slot repair shop, we replace scratched or broken touch screens on our LCD monitors so we have to have a good inventory of glass touch screen sensors. There are some basic storage techniques for storing touch screen glass that must be followed. Lying flat and stacking the touch screen glass without some foam or other packing material between glass screens is a definite no-no. Besides making it hard to find the touch screen you need, you can scratch the glass just by moving them around. Yes, new glass touch screens do have a protecting clear film on both the front and back sides, but do not rely on that to fully protect the touch screen. Storing touch screens on a shelf, like book is also a bad idea, mainly because there is no really good way to label which touch screen is for a specific monitor or game manufacturer. You



can also run the risk of the glass touch screens banging into each other and getting damaged or scratched when they are removed or spare replacements are placed back on the shelf. To make touch screen storage even more of a challenge, there are many different types and sizes of touch screens used throughout a typical casino. Our current touch screen inventory consists of close to a dozen different types and styles of glass touch screens. Of course, we have multiple quantities of the same touch screen so it's not unusual to have to have three dozen touch screens in stock. Touch screen sizes vary from the small touch screens used on the IGT Advantage NextGen and the newer Bally Alpha and WMS reel games to the larger more standard size touch screens. The largest touch screen we have in stock is for the 24 inch monitor used on the Bally Cinereels.

Unlike the LCD monitor storage system mentioned above, it's safer (and real space saving) to store the glass touch screens vertically using an easily built holding system. This holding system uses three pieces of one and a half inch or two inch black ABS water pipe. The black ABS pipe will have to have several perpendicular cuts made into each pipe. Each cut will hold one touch screen. You will have to have multiple cuts in each of the three pipes for each touch screen and each cut will be the same in each of the three pipes. Two pipes are positioned on the front and back of the metal shelf. The third pipe is mounted on the back wall of the metal shelf to hold the touch screen glass perfectly vertical. Make each cut on one inch centers. This will allow enough room for your fingers to grab and remove a touch screen easily. Depending on the length of the pipe, you can store 20 touch screens on a twenty two inch long pipe. The extra inches allow for easier mounting.

To make the cuts in the pipe, a table saw is the easiest but a standard wood saw can also be used. A standard table saw blade cut is about 3/16th inch thick. The normal

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touch screen thickness is about one eighth inch thick. You do not want to make the cut through more than half the thickness of the pipe. Making the cuts in the pipe more than half of the pipe thickness will reduce the pipe strength and possibly weaken the pipe.

Twenty touch screens together are not light in weight. Also making the cuts too deep will cause the touch screens to be pinched and possibly get damaged when the touch screen is placed or removed. Your available shelf space dictates how long to make the set of pipes. Since the aver-

age shop shelf space is three feet wide, all three pipes can be cut to that same length.

Mounting the ABS pipes to the shelf can be accomplished several ways. Double stick foam tape sticks great to the pipe and the metal shelf. You can also purchase some end caps to mate with the ABS pipe so the pipe can be screwed on the outside edges of the metal shelf.

Before you start to

place your touch screens on the holder, you must tape the touch screen connector or tail to the glass touch screen. Don't leave it just hanging; it might get pinched next to another touch screen and get damaged when it's removed for use.

Using both of these methods for LCD monitor and touch screen storage will minimize damage, make inventory easier and clean up an area that is generally in disarray.

- Vic Fortenbach
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KICTeam has announced that it has developed a new JCM Waffletechnology™ cleaning card for JCM Global. The new cleaning card is similar to the one KICTeam previously designed but incorporates a larger waffle pattern to accommodate international currency validators.

"The initial JCM Waffletechnology Bill Validator Cleaning Product was a tremendous success for our domestic customers," said David Kubajak, director of customer service, JCM Global. "We are thrilled to bring the same technology to our international customers, in a new design developed specifically for the international marketplace. KICTeam were again able to provide us with a streamlined solution to meet our needs."

"Building on the success of the original product, our developers were able to quickly and succinctly develop a product that met the criteria put forth by JCM Global," said Peter Klein, president and CEO, KICTeam. "The company is happy that it has been able to continue its relationship with JCM Global as well as provide cutting edge technology to make world class cleaning cards."

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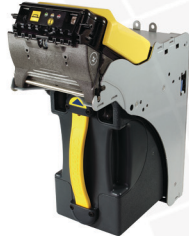
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Aristocrat “Loco Loot” progressive

Have you ever had a “Loco Loot” progressive sign where the amounts were different than the game amounts? A slot attendant notified me that the two were not the same and sure enough, they did not match. The sign had a lower amount. I’ve run into this type of situation before and thought to myself, why not try to reboot the controller to start off with? I rebooted it and not much happened. All it would display was “Hyperlink establishing communication.” This stayed on the screen for about five minutes or so. Something should have happened during this time, not only display an error. I rebooted the controller once again and this time, within a few minutes the sign worked perfectly. The “train graphics” appeared then the progressive amounts started to catch up with the actual game amounts. I was glad two simple reboots got the sign working again.

Setting up “Promo Cash”
What exactly is “promo cash”

Quick & Simple Repairs #41

By Pat Porath

at the Island Resort and Casino? It is the “promotional cash” that a lot of the slot machines here accept.

One example would be, a hotel guest stays overnight and receives a “promo card” with \$20.00 on it and instructions on how to use the card. Next, the guest would insert the card into the card reader of the game and enter their four digit pin number. After that, they press the number 2 for “promo” then the number 1 for the “promo cash” to go to the game. At this point, they can enter the dollar amount that they would like to download onto the game.

Say the guest would like to play \$10.00, they would press the numbers 1 and 0, then the ENTER key. If everything is working properly such as the game communication, the Oasis system, the slot machine is not in the middle of a game, all of the slot doors are showing closed and all of the game options are correct, then the \$10.00 in promo cash will download onto the credit meter of the game.

Once the amount is downloaded, it cannot be cashed out. Some games will display a message right on the screen showing “unable to

cashout promotional credits.” On others, the button lights will flash once and go right back to regular game play.

In the “old days” we used to have “Quick Silver” quarter token games where a guest would receive \$10.00 or \$20.00 in Quick Silver quarter tokens and play on a specific bank of machines. The games would accept the quarter tokens and pay out in real quarters. “Promo Cash” is similar in that respect. The game “downloads” promo cash and all wins are regular cashouts, with the exception of the remaining promotional money. Say a guest downloads \$5.00 in promo on a dollar game, spins the game twice at a \$2.00 bet, and wins a total of \$20.00, the credit meter would show 21 credits. If the guest cashed out, the game would payout the \$20.00 and have \$1.00 credit remaining. When a guest is playing a penny game and the credits are in the hundreds or thousands, they often periodically cashout to see what promo cash is remaining on the game.

The Technician Side of Promo Cash

As stated earlier, the Oasis

system Version 11.7e, all of the communication, all of the slot machine doors have to show closed (including logic and drop doors) the game has to be properly entered into the Oasis system perfectly and ALL of the game options have to be PERFECT. Everything has to be exactly correct for promo cash to work properly. On a Bally Alpha stepper game "Black Gold Wild" with five reels and an upper LCD, some of the specific game options are as follows:

AFT is "SAS Primary" (AFT means Advanced Funds Transfer)

"certificate out" = OFF

"legacy bonusing" = SAS primary

"machine control" = SAS primary

Other options include:

"allow bonus transfers" = "not set" (not set also means disabled)

"allow debit transfers" = "not set" (this is for the use of actual credit cards)

"allow transfers to game" = "enabled" (this is so the game will accept promo cash)

"allow transfers from game" = "disabled" (this is so guests can't cashout promo)

"allow partial transfers" = "not set"

"set max transfer limit" = "not set" (may need to be set to \$1000.00 depending on specific game software)

"set pay win" = "host"

"host cashout mode" = "host controlled" (the host is the Oasis System in this application)

Of course all of the other game options need to be set properly also, so the game is communicating properly with the system.

What about Promo Error Codes? After EVERYTHING is optioned and looks PERFECT, now you have an error code when you try to test promo on a game. What is up with that? The Oasis error codes are as follows: (once again this is Oasis version 11.7e)

G-2 = door open

G-3 = transfer limit too low

G-4 = transfer limit too high

G-5 = SAS problem

G-6 = credit switch (button)

G-7 = tilt condition (game tilt)



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G-8 = also a SAS problem
G-9 = game in progress (credits that are bet)
G-10 & G-11 = also SAS problems
G12 = disabled by SAS (communication error)
G-13 = game out of service
G-14 = busy SAS problem
G-16 = AFT locked (game in progress, door open, etc.)
G-22 = system timeout (possible Sentinel COM problem)
G-23 = Bart problem (game may not be in the system properly)
G-93 = AFT asset number error (wrong machine number or wrong location number in system)
G-99 = AFT not locked, COM lost during transfer

S-22 = SAS timeout
S-23 = denom mismatch
S-24 = COM lost between Sentinel and game
S-32 = invalid transaction ID, poller and Sentinel versions aren't compatible
S-33 = game COM down
S-34 = dollar range out of limit (trying to download \$1 on a \$5 game)
S-35 = AFT mismatch, machine and Sentinel IDs don't match correctly

A few of the error codes are similar and are basically the same thing; at least it gives an idea where to look for the problem when one occurs.

WMS Bluebird AFT Options

When getting ready to option "Bluebirds" don't forget to ENABLE or DISABLE options in the WAT setup section. If the game does not have the WAT option, then more than likely the OS (operating system) is earlier than 1490. With OS 1490 and after, more than likely the game

will have the WAT option in the "COM setup" area. The WAT options for "promo cash" to function properly with the Oasis system and Bluebirds are as follows:

ENABLED = in house transfer
DISABLED = debit transfer
ENABLED = partial transfer
DISABLED = bonus coin out win transfer
DISABLED = bonus jackpot win transfer
ENABLED = promo transfer (allow promo cash transfers)
ENABLED = transfer to GM (promo transfer to game)
DISABLED = transfer from GM (promo transfer from game)

Without these "COM setup" options set correctly, the game will not accept promo cash and result in an error. One quick way to tell if the game is communicating with the system is to insert your floor or mechanic card and see if the main slot door shows OPEN and CLOSED. If the Oasis display does not show the proper door closure when the actual main door is opened and closed, the game will not accept promo.

For our senior customers who can't see very well, the slot attendants assist with their player cards and downloading promo. They also help the customers that haven't been here before. Our "seasoned" customers really like it. They receive the money on their card, sit down at their favorite machine and play. Others turn in accumulated player points for promo cash, then play. It's pretty cool once they are used to it.

Just Another Day at the Office

Just another day being a slot tech. We had a sign installation scheduled with a company and it was installed OK and on time. I think they started around four in the morning. After that, a truck came in with five new games and three outside techs to assist in the installation (the sign alone has a total of 8 LCDs). One thing that happened was that when the sign was near completion, it accidentally sat on a main power cord. Now, how do you lift up a large sign only two inches WITHOUT damaging anything or tearing anything apart? I was asked over the radio what kind of jack I carried in my truck. At the time I had no idea that it was to possibly lift a sign up. When I arrived back at the bank of games, I found out what was going on. A co-worker contacted maintenance and found a beautiful Craftsman 3-ton floor jack. It was carefully placed in an opening near the bottom of the sign where some steel bracing was located. I didn't want to, was not going to, and did not operate the jack to ATTEMPT enough clearance to remove the power cord. As I stood back a bit, someone else placed a 2 x 4 on top of the jack to distribute some of the weight and proceeded to slowly, carefully, jack the sign upward. Everything looked great, nothing started to bend or crack and the power cord was removed and properly put in its place. Next, the sign was ever so carefully lowered back onto the floor. Without incident, everything went according to plan.

Editor's note: Why is NASCAR so popular? It's because everyone loves a good car crash. Hey, Pat. Where's our car crash? I am so disappointed! Ha ha!

Bluebird Stepper Without a Seven Segment Display

I received a call to a popular WMS Bluebird stepper game. The attendant stated that there wasn't anything showing on the seven segment display. Sure enough it was blank. The attendant had the main door open when I arrived, so I closed it and still no display. I opened the door back up to check the connections on the door and the attendant said, "Do you think it is a bad display board?"

I said, "It very well could be, I'll find out." All of the connections for the unit looked fine on the door part of it. I checked the main door hinge area because I have found pinched cables in that area before (I don't recall if they were WMS cables that were pinched or our Oasis cables). Everything looked fine there. What about the backplane board area? All of that looked OK too. Maybe it was a bad display board after all. Instead of looking for a spare display on a parts shelf, I thought, why not try a reboot? These games run 24/7, so a reboot was done. Once the game completed the bootup process, the display lit up awesome. In conclusion, if you receive a call that a seven segment display is out on a stepper Bluebird, try a reboot before replacing parts. It just may work.

RAM Battery Low Error on a Bluebird

Have you ever run into a "battery low" error on a Bluebird? This was the first time for me. What came to mind was pretty much the same procedure as a tech would do on any other game: Remove the old battery, install a new one, and then set the options on the game. Due to the fact it was the first time running into this error, I wanted to try a few things BEFORE putting in a new part. What if the battery is still good? I knew that the game was only a few years old. How could it be bad already? On the game board,

there are two "button type" batteries that are on the main processor board. The logic board (or main board) cover was removed and — here's the trick—I RESEATED the batteries. After that, I powered the game back up, checked all of the game options and closed the main slot door. The battery error had cleared! I worked on it in the morning and did not hear a complaint of it since. I thought I may get called back to it a little while later if the battery was in fact bad but as far as I know it is still working error free.

- Pat Porath
pporath@slot-techs.com

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An Easy-Going Saturday in Malta

By James Borg

It was an easy-going Saturday morning, the sun was shining outside and the time was just 10:15. Barely fifteen minutes had gone by since the place had opened its doors and clients were slowly coming in. It's usually a bit slow during this time of day and month here in Malta as most would prefer to go to the beach and get themselves their long awaited sun tan so they can look even better than they usually do during the colder months. I had just gone around the entire floor checking out the machines to see if all was in order whilst saying good morning to the staff I passed by during this daily ritual. The morning parade usually consists of seeing that all the bill validators have got their runway lights on, looking out for blacked out neons, checking to see if there's still any credit left in the machines from the night before and other similar things which can cause problems during the rest of the shift or make the place look bad. All seemed fine that morning anyway.

Finishing the round, I was just going back to the office to check the paper work and emails from the previous shift when I noticed this group of about eight elderly ladies in the reception, all eager and waiting to come in. I only recognized one of them while the rest seemed like new faces. From their body language, one could tell that the majority of them had never set foot in the place as they were acting a bit nervous. Nothing to be nervous about. Really,

there isn't, as we don't eat people here (not even a nibble). Just have a bit of fun, have a laugh, have a drink and hope the luck doesn't run out quicker than the money does.

It's not the first time that a coach load of elderly ladies has decided to make a morning out of it by coming to our casino. It's usually a case of making a choice between going to play bingo and trying their luck on our slot machines. A great attraction to this job is going 'round talking to clients. Some of them are a scream, as this group coming in now actually turned out to be.

I've noticed that the previous generation of people don't usually go for the newer type of machines, with combinations and lines and features and scatters and free games and bonuses and music and fancy lights and sounds and help screens and a never ending number of buttons that makes one believe it's an airplane's switch panel looking back at you. These people just prefer the older type of slots or as they call them, the one armed bandits. Ours have three stepper reels, a handful of buttons and a handle on the side to pull on if they feel like it instead of pushing the SPIN button. Sounds blaring out from surround speakers and blinding lights are a minimum on these slots and that makes older people feel more at ease, more relaxed and above all, they have the welcome perception of being in total control of the game. They just want to spend a couple of hours putting coins in and hope that more coins come out into the tray then they actually put in.

True enough, this group settles down on five such machines we have just outside our office. The slots under discussion here are Bally. Just like highly trained soldiers on parade, they walk straight towards them in single formation, turn left, pull a chair out and sit down. There weren't enough of these machines in this particular area so three of the ladies decided to just sit in the background and watch their friends play and learn from their mistakes. They paused for a few seconds while they looked around, getting the feel of the place and put their handbags in a safe place within reach. The silence was broken when they all started shouting to each other if anybody knows how to play them and which buttons to push and where does the money go in and what happens if this button is pushed before that button and a variety of questions enough to fill my morning quite easily. One even asked for the "powder room" and with to all the enthusiasm she could muster, announced that she had to go and have a wee; she was only here for five minutes.

Luckily enough, their ringleader is a regular. She proudly told me it was her good idea to bring them as they were on a weekend break and she thought her friends would get a thrill if they were to go to the casino. She patiently told them where to put their money and which buttons to press while the rest of them looked all eager and waiting to try their luck on the machine they had picked out. Once the briefing was over, all were happy putting their money in and

pressing buttons while watching the reels go round and keeping their fingers crossed that the right combination for the jackpot comes out.

A smiling hostess saw to their needs while they were playing, which made their visit even more pleasant. They had become a bit thirsty and peckish due to all the stimulation and nothing would be more welcome than to down a nice cold soft drink or something hot and eat away at one of our freshly made baguettes.

Editor's note: I can't wait to visit Malta. Fresh Baguettes? Yum!

I saw one of the ladies trying to get the ringleader's attention. She wanted to ask her about a problem she seemed to have on her machine. She looked a bit confused for some reason. She had a pair of the latest fashion sunglasses on and was wearing a liberal application of makeup all over her face but the highlight of it was her bright red lipstick which was slightly smeared to one side. I eventually had to intervene along with Manuel, my slot attendant for that morning.

"And what is the problem dear?" I asked her. She pointed towards the machine as the reels were going round while an "ERROR 42" showed on the display. Opening up the machine and hitting the reset got the reels back under control. "Can you please try again?" I told her while I kept my fingers crossed. She hit the SPIN again and the reels started moving, when an error BLEEP sounded as soon as the middle reel starting rotating and the same "ERROR 42" registered on the machine's display. "Oh dear, something's not quite right here apparently. If you can just move back a few inches, I can have a look to see what's causing this problem."

The error displayed was specific to REEL #2 Tilt. A quick inspection didn't show anything out of

the ordinary so I pulled the whole reel out and took it to the workshop for a better look. I've never had this fault before but I know for a fact that there's an electronic module somewhere inside the reel itself that controls the stepper motor's movement and there's also an optic sensor. The motor was going around properly, no jittering movements, no unusual motion, so I very much doubted that the problem originated with the driver or its related electronics. The easiest and most practical place to start was to clean the optic sensor itself with a cotton bud and some isopropyl alcohol.

It was somewhat dirty, which is hardly surprising considering the fact that I doubt if these sensors have ever been cleaned during their ten-year period in this place. Taking the reel back and plugging it in place took only moments. I asked the lady with the bright red lipstick to try again while I stayed close by to observe the result of my sensor cleaning exercise. Spin after spin was tried and the machine kept on working. That's just great and I told the lady that if she has any more problems, to please let me know or to ask a member of the

staff and we'll be glad to help her out. I got back a nice "Thank you, you're very kind" along with a bright red lipstick smile.

Minutes passed when the same lady got my attention. She had a bank note in her hand but instead of talking, she smiled at me making sure that I saw her bright red lipstick, whilst trying to put the note in, which the machine bluntly refused. The validator wasn't displaying its runway lights so there was no way on Earth that the slot machine was going to take her bill. I asked her if she could move slightly backwards whilst handing over the keys to my attendant to open up the machine and have a quick look. These Bally slot machines are simple and tough machines. They can withstand being bashed about, abused, kicked, punched and come away totally unscathed. Really great machines to have on the floor. Most times to clear a tilt, all that's involved is pressing the Reset button inside and the unit's back in action once again (unless it's a dirty optic sensor in the reels which needs cleaning that is).

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button didn't make one bit of difference as the bill validator's runway lights still didn't come on. When that happens, turning the machine OFF and back ON again usually does the trick. Not this time however. Nothing! Zilch! Nada!

Next thing to do before the lady with the lipstick got distressed (it was her machine after all) was to have a quick look at the stacker to see if any bills were stuck in it, inhibiting the operation and preventing the validator from going into the accept mode.

The ringleader loudly accused the lady with the lipstick of breaking it and the lady with the lipstick answered back "I'll break your arse if you're not quiet. This nice gentleman (me) is helping me out here, so you shut it!" (All the while looking at me and smiling broadly, just in case I didn't see her lipstick before).

There was only one bill in the stacker and it was properly stacked. I asked Manuel if he could go and get a spare stacker as the one in the machine wasn't somehow making the usual mechanical resetting noises. No reset noises means no runway lights and that means no bills and that also means one unhappy nice old lady wearing red lipstick which I couldn't allow, especially since she was smiling so warmly at me.

Whilst waiting for the spare to come, the ringleader (all cheerful and excited) told me that they are all going on a cruise together soon and that they have the money saved up already. The lady with the red lipstick agreed and asked me if I wanted to go with them (more lipstick action). I said I was honoured but that couldn't possibly come and it was very nice of her to ask me. Out of the blue came "She fancies you!"

"Maria's 80 you know, and past it! If you want, I'm only 70 and available!" another voice said, and they all started laughing

loudly.

A woman on her own, playing a few meters away on an Atronic, couldn't help overhearing the conversation and I could see that she was silently tittering at what was going on with this group of ladies. To involve this tittering woman I said loudly to Maria "I can't come in any case because THAT woman (pointing and smiling towards her) would be very cross and jealous. She'll come and beat you up".

With that, the tittering woman got into the game and came over and in a very serious voice told the red lipstick lady "You keep your hands off him, he's mine!" and with that the whole area burst out with laughter. It's really great how a handful of old ladies and a tittering woman can bring a place to life and these ladies were doing just that perfectly. Who said working in a casino was boring? Ours certainly isn't. Come visit me some time in Malta and you'll see.

Manuel returned with the spare stacker and replaced the original one. The runway lights still didn't come on and the resetting action noise from the stacker wasn't anything to write home about. Trouble ahoy. I can smell it in the air. Pulling out my little LED flashlight, I had a look inside where the stacker is housed. My worst fears were realized. It's happened before and it will certainly happen again. And true enough, it did! A look inside the stacker cage showed that the connector that slides into the stacker was well and truly past its best. Pretty knackered would be more appropriate. Not to mention gone beyond the point of no return. Gone to meet its maker. There was no way I was going to fix that in the state it was. Its pins were bent and the plastic spacers between the pins were broken. Some were even missing, with the risk of them shorting together and blowing up the board. Not recommended at all. That would have really upset

Maria, as I didn't have a spare board at hand. The whole thing had to be pulled out and replaced totally. Much to my disappointment, I had to tell this nice old lady that I had to switch her machine off for a while, at least until I changed the damaged part. There wasn't going to be much playing on this machine the way it was.

Maria's face was the picture of gloom but I promised her that it wouldn't take me too long and that she could come back to play on it very, very soon. I didn't even have to finish the sentence when her face glowed and her red lipstick seemed to shine even brighter. She waved me off and I rushed off to the workshop to find a spare. Try as I might, looking high and low, and in every drawer and cabinet, I just couldn't find a replacement connector! Ouch! Crap! How am I going to break it to her that she has to be bored out of her mind for the rest of the time her friends were there? It is said that necessity is the mother of all invention, and this certainly was no exception. With that train of thoughts still fresh in my mind, I pulled out an old, but complete bill validator from the pile of FUBAR ones I kept to cannibalize from. Luckily enough, one of them had the same type of connector but it was wired up totally different and ending up in a totally different connector, so a spot of surgery was required to save the day. This was sorted out in a jiffy or two and when I got close enough, I'm sure that there must have been love in Maria's eyes at the sight of me coming over with the repaired connector.

Putting everything back together again with Manuel's help, the whole thing was set up, stacker in place and fingers crossed till the runway lights came back on. Time seems to stop when you're waiting for something to happen. Seconds seem like hours. They did! They came on! We have runway lights. Wonderful! Brilliant! Happy days are here again.

Maria was visibly overjoyed at being able to put her money in and continue playing. The ring-leader told her "There you go Maria, that nice gentleman fixed it for you. Now don't you go breaking it again as he'll be upset at you."

Maria came back with "But I didn't break anything. I wouldn't dream of doing that to him, he's such a charming young man. In any case, you keep your dirty paws off him if he does come back, do you hear? You might put him off coming on the cruise with us."

I had just enough time to enjoy a hot chocolate in the office when I was needed again on the floor. As luck would have it, it was Maria again. It seems that it wasn't her lucky day as her machine wasn't performing as it should, which is a shame as it might ruin her outing with her friends. She was waving a bill and looking a bit disappointed. I went over and found that the runway lights were fine (thank the stars). Maria said that the bill was only going in a few inches, and coming back out. In a few inches, and coming back out. In a few inches, and coming back out. She had a glitter in her eye when she told me that.

I took the bill and said "Here, let me put it in for you."

A voice from two machines away echoed "Long time since that happened, eh Maria?" and a different voice said "That's water under the bridge you know now" while another voice said "Do you still remember what to do?" followed by "Chance would be a fine thing" while the whole group started laughing again.

"Please don't pay attention to my friends. They are just jealous that's all. They are only doing this because you're next to me".

I heard myself telling her "Don't worry my dear, as I'll stay here next to you for as long as you August 2008

want. The others don't interest me one single bit. You're the most beautiful woman out of all your friends".

Her friends nearly fell on the floor laughing their knickers off. I couldn't stop laughing myself and Maria joined in as well while the tittering woman tittered even more. What a morning this turned out to be...brilliant...just what the doctor ordered. Who needs a holiday up in the mountains with fresh air? Being in the middle of these ladies is the best medicine to cure anything.

Next second Maria's machine strikes the jackpot and all her friends leave their own machines and come running surrounding her, cheering her and patting her on the back.

"I can't believe it", she said. "What luck as I had nearly ran out of money." Her lipstick got smeared a bit more and her sunglasses fell down to her lap.

The ringleader said "There you

go; it's a good job I brought you here. I showed you how to play it (expecting a percentage of the winnings) to which Maria answered "what you're going to get is a poke in the nose for accusing me before of breaking it for this nice gentleman" whilst looking at me and smiled her broadest smile so far, so much so that her bright red lipstick gleamed exceptionally in the spot lights.

"What time do you finish so we can paint the town red?" she asked... and winked.

- James Borg
- jborg@slot-techs.com

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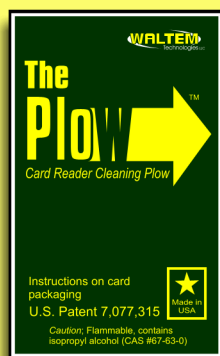
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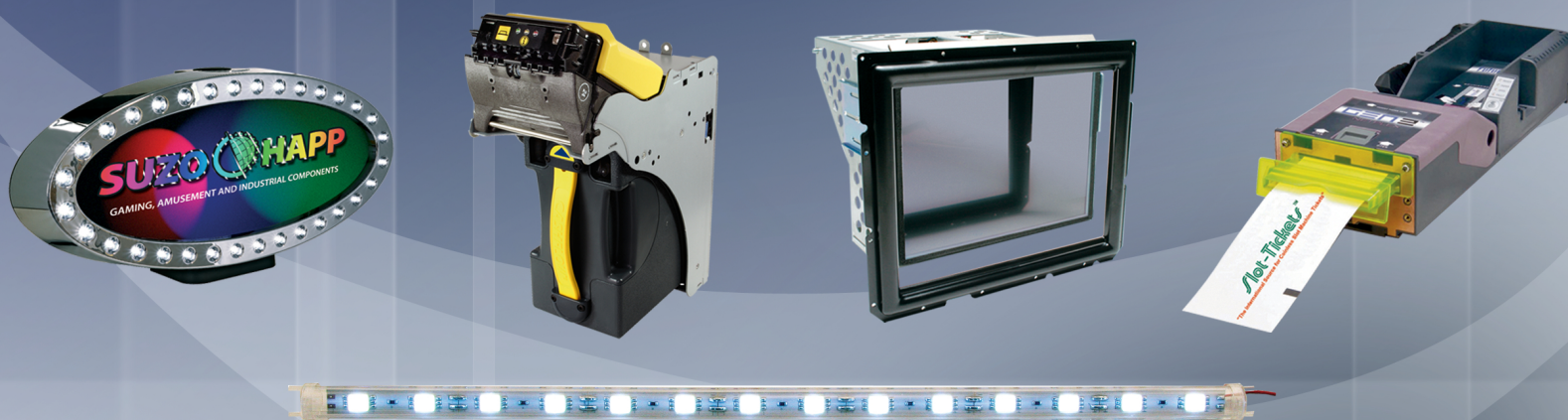
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