

June 2013

SLOT TECH MAGAZINE

Slot Machine Technology for the International Casino & Gaming Industry



More Epic 950
Repair Info From
Henry Kollar

\$10.00

Slot Tech Magazine

- **Cold Cathode Replacement Lamps (for every slot machine in the world)**
- **Player Tracking System CCFLs, Touch Screens and LCDs**
- **Bonus Screen CCFLs ("L" shape, "U" shape and Straight) Also LCDs (6.4" and 7")**

Single Cold cathode lamp assemblies for: IGT NexGen & Bally Iview Player Tracking Systems and WMS Bonus screen 6.4" LCD, also Konami bonus screen 7" LCDs ("L" shape CCFL and "U" shape CCFL)

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

FOR BALLY

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

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

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

#1240 - 6.2" Hitachi LCD \$TX16D11VM2CCA

FOR KONAMI

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

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

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

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

FOR WMS (Williams)

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

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

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

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Slot Tech Magazine

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Page 4-Advanced Repair of Ithaca Epic 950 Printers-Part 2

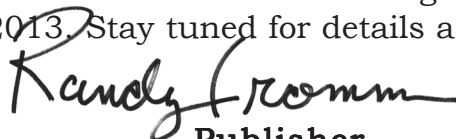
Page 14-Quick & Simple Repairs #96

Page 20-Super SMIB connects SAS to EVERYTHING!

In this issue is part two of Henry Kollar's detailed look at the Epic 950 printer and how to repair/rebuild it. Please recall from part one (April 2013) that this article was originally written in Slovakian (Henry's native language) and it was machine translated by Google so, despite some light editing, it is not exactly perfect English. As before, please don't be too critical as I elected to limit my editing. I'm certain you'll comprehend what he's saying.

This is some of the most intense "technicianing" that I have ever seen. This type of work is more akin to the work of an "engineering technician" here in North America rather than a repair technician (which is what I am). In general, I don't modify ANYTHING. I just replace bad parts with new ones. Sometimes, I'll raise a specification such as a voltage or current rating but that's usually due to what's available as a replacement rather than my second-guessing the engineer that designed the thing.

Also, I want to thank all of my presenters and everyone who attended TechFest 27. It was a fabulous event, made even better by some really great food and our charming hosts from Mystic Lake Casino, Tim Sapp and, especially, Norm Hohenstein. Every year, they take us on a "back-of-house" tour of the best slot shop on the planet. The next TechFest will be in Las Vegas, likely in November 2013. Stay tuned for details as they become available.



**Publisher
Slot Tech Magazine**



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Randy Fromm's Slot Tech Magazine

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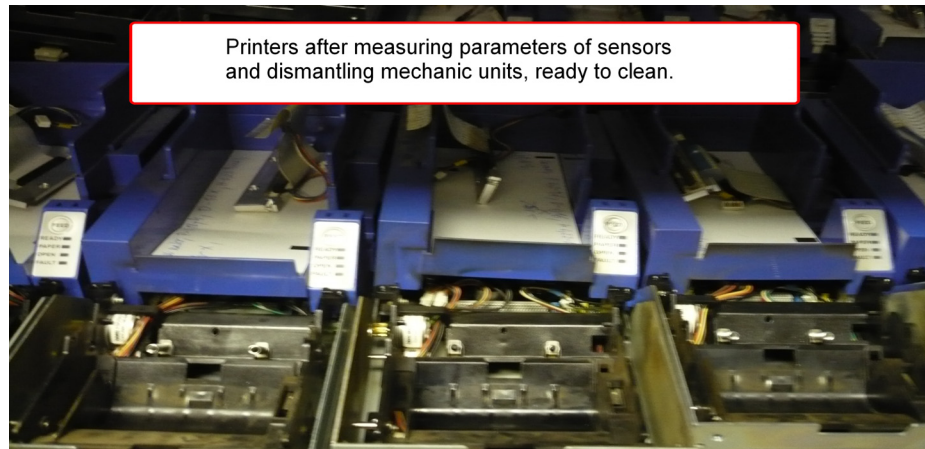
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**Regional Slot Tech Class
Apache Casino Hotel
Lawton, OK
June 18-21, 2013**



Advanced Repair of Ithaca Epic 950 Printers-Part 2

By Henry Kollar



Editor's Note: The following article was written in Slovakian with machine translation by Google. As editor, my job is to make the reading a bit easier but, to be honest, because this is a technical article, you likely can understand it just as well as I can without editing. I've made a few revisions but, by-and-large, I have published it just as Google translated it. Don't be critical. There is a lot of very useful technical information here. Original Slovakian available upon request. Just drop me a line. editor@slot-techs.com

2.0) Mechanical Faults

Mechanical failures are due to dust pollution of mechanical units, infiltration of sticky liquids or dropping of foreign objects inside the mechanical unit. Sporadic cases have also been falling of steel washers and screws into the mechanic unit or control board causing the irreparable damage the thermal head or control board.

On failure after heavy dust pollution is especially prone the presser mechanism thermal print head, so after closing the door and insert the paper is not optimal contact thermal head with the paper and print quality is so poor and also causes jamming "Transport" and "Feed" mechanism.

Ultrasonic cleaning:

When using ultrasonic cleaning is usually not necessary to disassemble the mechanical unit and individual components. I have good results in ultrasonic cleaning with a mixture of water and the chemical preparation "Alustar 300" or "Star US4" in a concentration of 1:40 (2.5%) the temperature of the cleaning mixture is 50°C (122°F) and cleaning time is 10-15 minutes, followed by rinsing

in water and drying by compressed air.

This procedure is suitable for cleaning any mechanical unit eg. BV etc. Also for pcb cleaning, connectors, terminals, relay contacts, switches etc., because mentioned chemical agents do not support oxidation of metals. After cleaning the solder points, the remaining rosin and other fluxes will appear as white spots, which can easily be removed with alcohol. Regardless, the white patches do not affect the functionality.

Hand cleaning:

Completely disassemble mechanical components from the mechanical unit and thoroughly clean the individual parts as shown in Figures 12 and 13 with a toothbrush, in warm water with detergent for washing dishes. Inside plastic bearings should be cleaned with a mascara brush (unused for makeup). The lower part of the mechanical drive





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without mechanical parts should be cleaned using a cleaning foam, mainly in places with contact of paper.

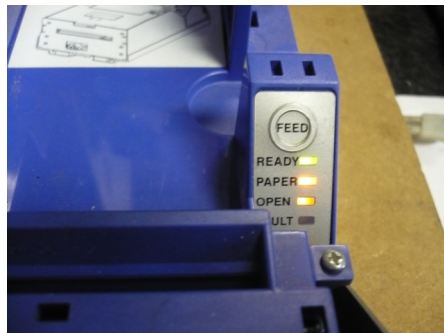
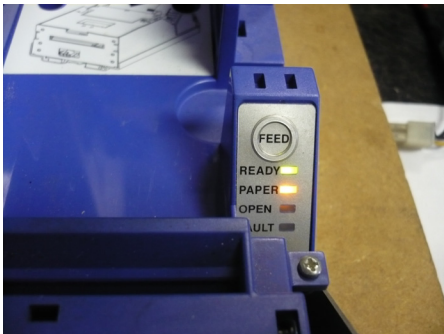
Thermal print head should be cleaned with a soft cloth or tissue paper moistened with alcohol. The control board can be blown dry with compressed air. To clean the sensor, it is suitable to use a cleansing foam. Residues shall be blown dry with compressed air.

Production series printers since 2007 have added a flexible mat below the large wheel "Transport" mechanism. This production adjustment was to ensure noise-reduction for the transport drive but these printers are more prone to dust by frequent paper jams (paper is not ejected out; a crumpled ticket remains inside). I recommend this flexible mat be removed.

3.0) Failure in the Control Board

The control board is the heart of printer. During six years of experience with these printers, these are the four most common failures of the control board:

3.1) Totally Dead Printer - after turning on is silence, no beeps or noise drive "FEED", status LEDs flash alternately like a Christmas tree or permanently lit as the Figures 14 and 15 Printer cannot write flash firmware. In this case, the most common failure is fluctuation of the voltage (ripple) in the main supply voltage of the +5V logic. Connect a voltmeter to the positive terminal of electrolytic capacitor C68 with the "common" side of the voltmeter connected to GND. The correct value should be 5V with a tolerance of +/- 0.1V (4.9V to 5.1V). For accurate measurement of ripple, it is preferable to use an oscilloscope or analogue voltmeter. From my experience, this disorder suffers from particular production series since 2007 with yellow markings components in the pcb.



The cause is the use of less quality SMD electrolytic capacitors C68, C66, C51. Older production runs without problem and have been working for seven years. These SMD capacitors do not have a "safety vent" in the package and so do not open (they do not blow open). Quality can be measured only by measuring ESR or Tangent

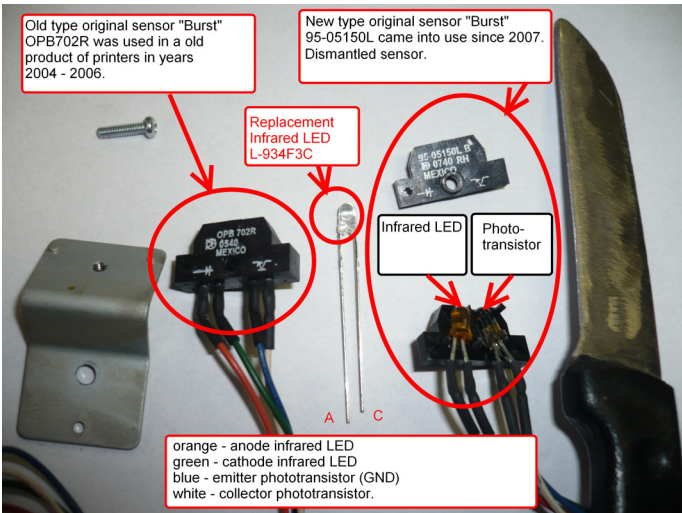
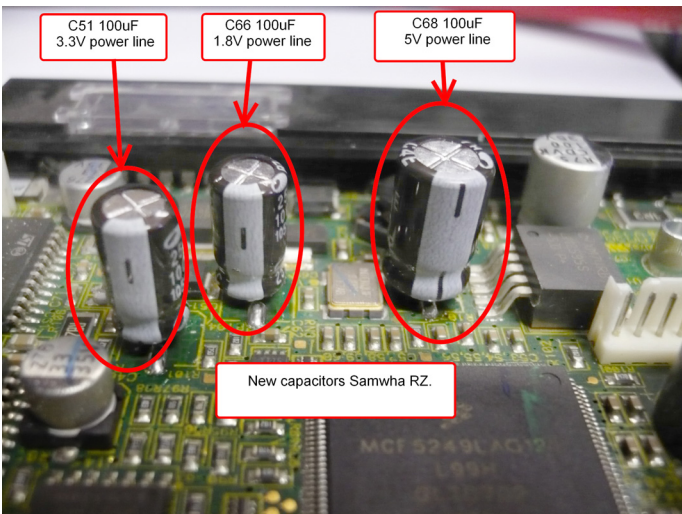
Delta (Dissipation Factor), but capacity can also be down to 85 microfarads (in production tolerance +/- 20% compared with the nominal value of 100 microfarads), yet DC-DC converter U17 from 24V to 5V is not working properly. In Figure 16 is shown the control board after replacing three capacitors: C68 5V main line, C66 main line 1.8V and C51 3.3V main line. I use "Low Impedance" electrolytic capacitors (Samwha brand, type RZ) because their parameters ensure that the printer will not fail for another six years or more. C68 100 microfarads/35V size 8x11mm. C66 and C51 100 microfarads/25V dimension 6,3x11mm.

3.2) Similar symptoms as a malfunction in point 3.1) but 5V is stable.

You need to check or replace U14 LM339 (SMD SOIC-14 package). The most common cause of damage is power surge peak in 24VDC line.

3.3) The malfunctioning data communication - printer seem to work, but slot machine/server announces that the printer is not connected.

The most common failure here is damaged U11, TTL to RS232 converter. This converter is also needed for uploading new firmware via the connector CN2. In my opinion, U11 is damaged caused by





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human error when accidentally un-year named person plug in to CN2 connect power 12V from PC power supply or something like that. Replacements U11 are ADM208EARU or MAX208C. The IC must be ordered in smd package TSSOP-24.

3.4) The test ticket is missing the serial number or other printer settings.

Try loading (write flash) the printer firmware and if that does not help, try to save the new setting via some program at a designated this operation accessible for free download at the printer manufacturer. By this operation can be solved almost everything except the missing serial number.

We met with a manufacturing defect in one series of new printers, missing serial numbers. Because of time pressure, during installation of a new casino we must solve the problem as follows:

The unserviceable scrap boards after damage control fluid penetration and oxidation, we removed the U12 24C08 EEPROM. Its contents are read in the chip programmer and written to other EEPROMs in memory for other printers with missing serial number. Then we flash the firmware. This problem has been solved with it that all these printers have the same serial number, which we did not mind. But if Netplex network to be an issue and if it is necessary to use any content from another printer a broken control board.

Modify worn sensors and sensors out of tolerance:

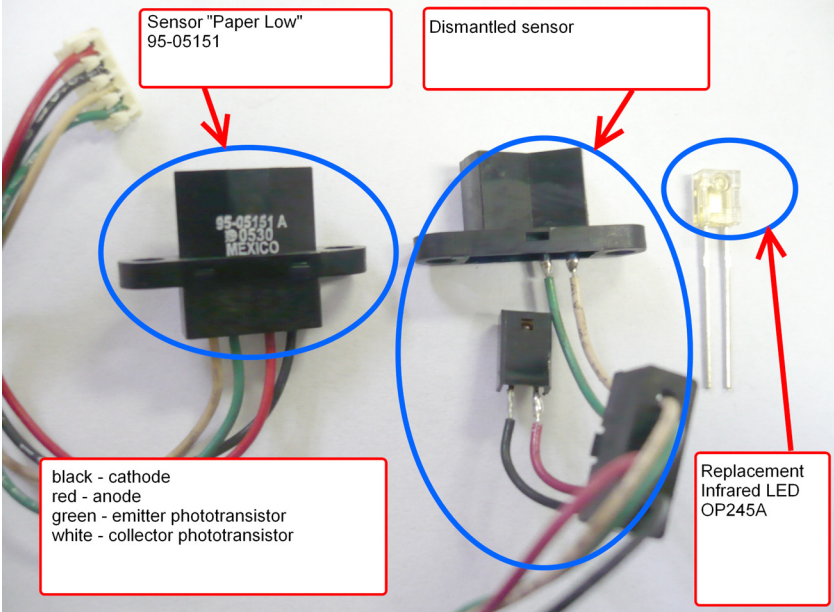
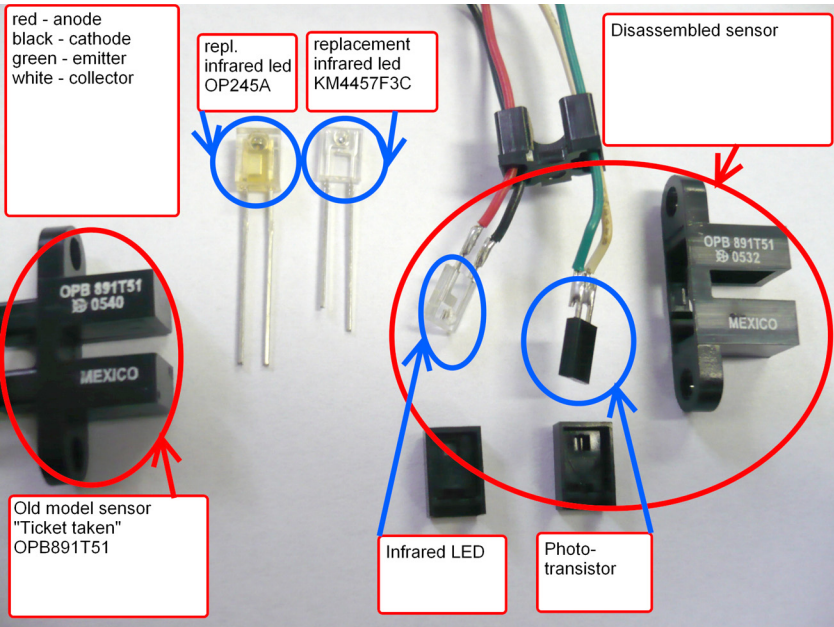
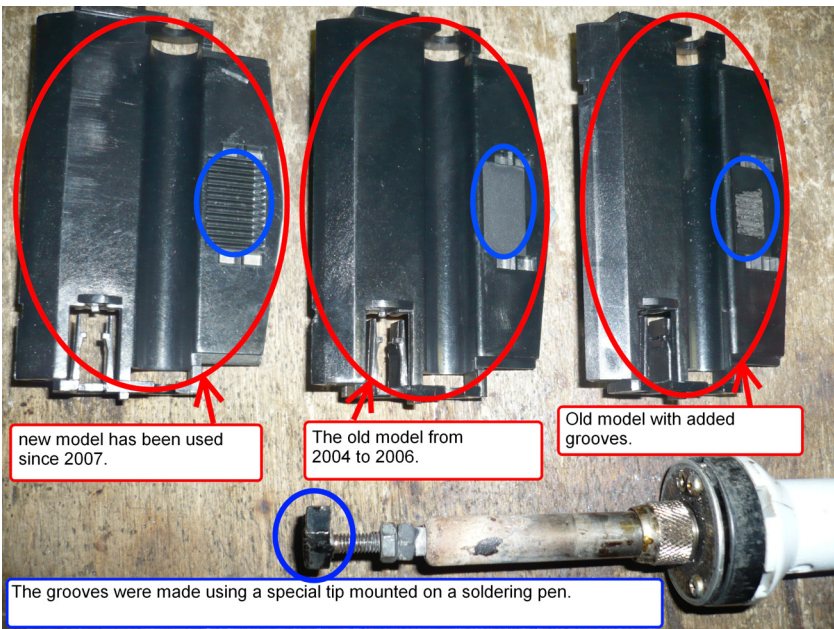
Burst Sensor

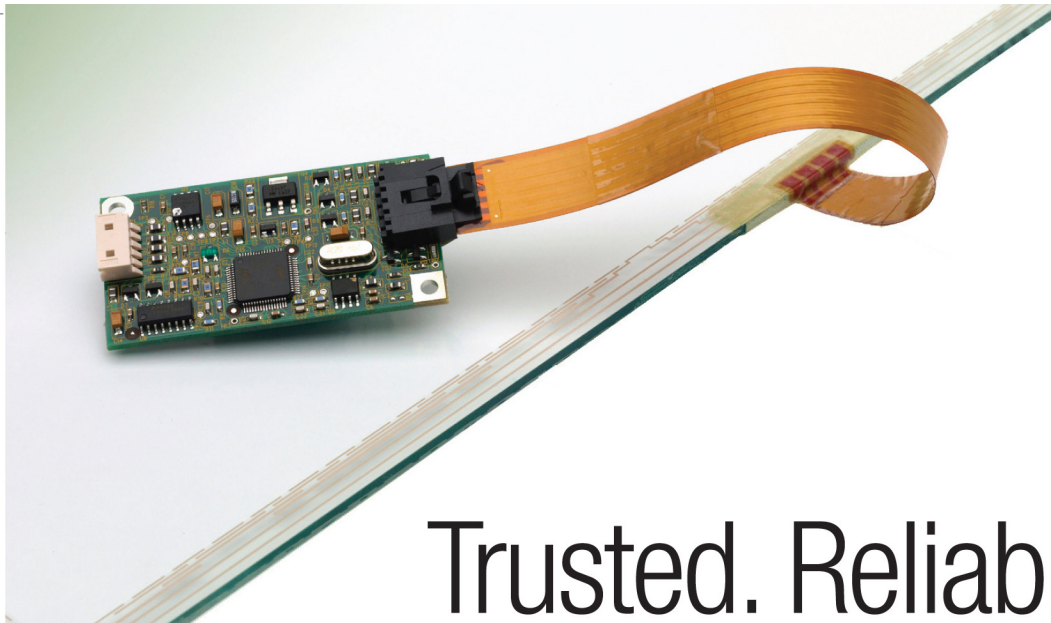
The cheapest and most durable solution is to disassemble the old sensor and old original infrared LED replace for type L-934F3BT or L-934F3C manufacturer Kingbright (<http://www.soselectronic.com>) price of \$ 0.1 per piece or use a diode with the same parameters).

This sensor can be re-assembled by applying a little melted piece of plastic material from a hot glue gun and then closing the sensor housing.

In Figure 17 is shown the original sensor, disassembled sensor and a new infrared LED L-934F3C.

If you repair the older printers before





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build 2006, there should be an replace of infrared LED to make scratches on plastic component item 14 of Figure 4, as shown in Figure 18, because the new infrared LED has a higher light intensity compared with original type 2004-2006 series sensors OPB702R.

Parameters of the modified sensor are:
no paper, more than 3.5V (typical 4.5V)
with paper, less than 0.12V (0.08V typical).
The new parameters have a stability of at least five years, which is more than the original.

Sensor "Ticket Taken"

It is best to replace the old original infrared LED diode type and use OP240A or OP245A, manufacturer Optek (Mouser, Farnell, www.newark.com, www.rlx.sk in the price of \$ 1 per piece) or KM4457F3C manufacturer Kingbright (www.tme.eu in the price of \$ 0.17 per piece).

In Figure 19 is shown the original sensor, disassembled sensor and a new infrared LED OP245A and KM4457F3C.

If the old sensor value without paper is more than 0.25V or changing infrared LED the sensor values are still above the 0.2V, you can drill a hole into the black plastic cover (original black cover for phototransistor is with thin visor) with a drill bit of 0.8 mm (0.031 inch). Drilling will increase the visor hole, resulting in an increase of the light level for the phototransistor and the values will fall below 0.2V, while the "with paper" value will continue to be in the 3-3.5V range, corresponding to the correct parameters.

This modification was tested with the additional light of the bezel and internal lighting with neon fluorescent tubes, white led strips etc. It did not cause any disturbances.

Sensor "Low Paper"

It is best to replace the old original infrared LED diode type and use OP240A or OP245A manufac-

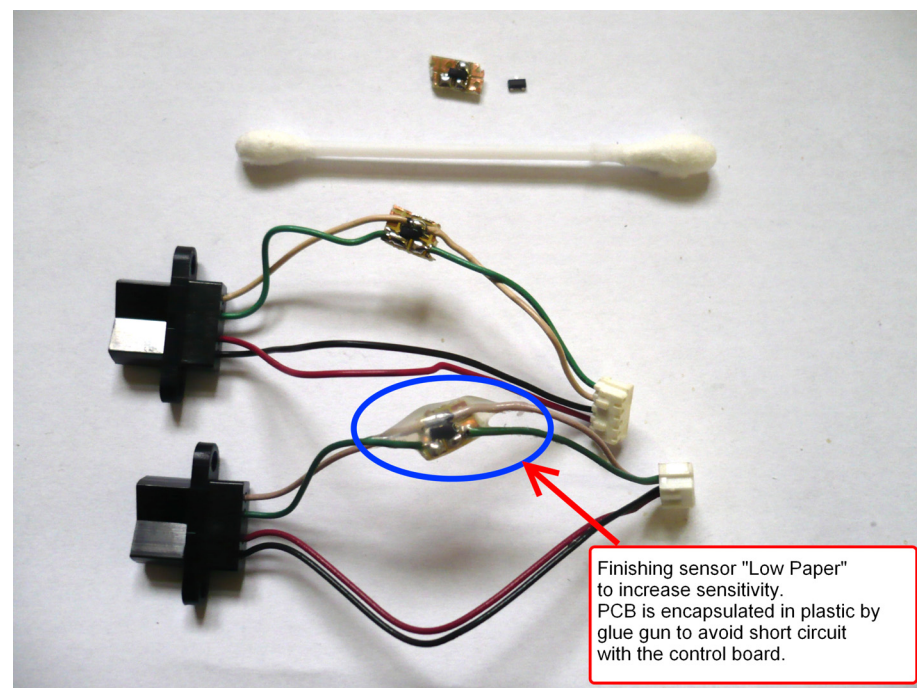
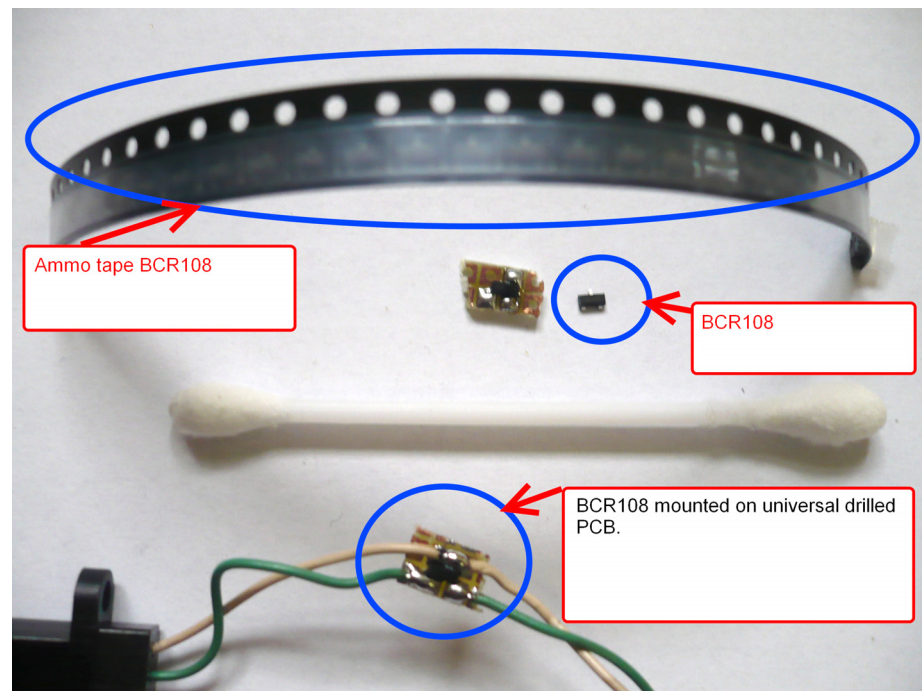
turer Optek (1\$ per piece), along with supplementing involvement of transistor BCR108 manufacturer Infineon (SMD package SOT-23) Mouser, Farnell, www.newark.com, www.soselectronic.com included \$ 0.5 per piece). This modification, together with phototransistor sensor, forms a new circuit (a Darlington) connection type in order to amplify the sensitivity of the sensor.

In Figure 20 is shown the original sensor, disassembled sensor

and a new infrared LED OP245A and Figure 21, 22 is shown modification the sensor using BCR108 together with phototransistor is darlington circuit. To complete the modification, you need to add to the control board pcb a 47k resistor (SMD size 1206) as shown in Figure 23.

In Figure 24 is a complete wiring diagram of the sensor assembly after modification. Parameters of the modified sensor are:

No paper, more that 3.5V (typical



Slot Tech Event

TechFest 27-Mystic Lake Casino



Slot Tech Magazine contributing author Pat Porath (l) and magazine publisher Randy Fromm inspecting the new drop-in bartop machines at Mystic Lake Casino. Pat is about to perform the liquid incursion test using a commonly available beverage. Or not.



Transact Technologies' Diego Mejia discussed their Epic 950 printer. This was Diego's first time presenting at TechFest. I hope to be able to work further with Diego in the future in South America as my Spanish isn't so good and he is a native of Columbia.



Super-trainer Bill Rigg (IGT). What more do you need to know? He's, er . . . SUPER!



Bill Vander Kooi (FutureLogic) presented on their slot machine ticket printers. This was Bill's first time presenting at TechFest.



Mathew Manders (WMS) totally ROCKED his premier, two-hour lecture on the WMS button panel assembly. Hooray! I hope we can work together in the future as everyone learned a great deal from his presentation.



ke Casino, Prior Lake, MN

New presenters and a new program made TechFest 27 the best TechFest EVER! I am hoping to repeat the event in Las Vegas in November (stay tuned for details) but those who were lucky enough to attend were treated to a lineup of speakers that was almost entirely new and TOTALLY AWESOME! I can't believe it but WMS finally came to TechFest in the magical form of Mathew Manders who gave us a quick, two-hour presentation on their button panel assembly.

But wait! There's more (there's a Ginsu Knife in there, somewhere)! IGT was also on board for the first time ever! Super-trainer Bill Rigg has to be seen to be appreciated fully. This guy can take a button and make it interesting! Go figure. I hope he'll be back for TechFest 28 and beyond.



Ceronix's Jill Hanes at the diagnostic lab stations.

Special thanks to Ceronix's Jill Hanes and Ken Lema who presented a morning "hands-on" session that included LCD panel teardown for everyone in attendance as well as FOUR diagnostic lab stations. This was the best thing TechFest has ever presented and I didn't have to lift a finger! Thanks for making me look AWESOME.

The anchor position was filled by JCM's Dan Petersen who presented on their UBA and iVIZION bill acceptors.-**STM**



3M's Paul Hatin (an actual engineer!) demystified casino touch screen technology and provided us with a ton of diagnostic software.





GEN 2 Universal Printer, Very Dark Ticket

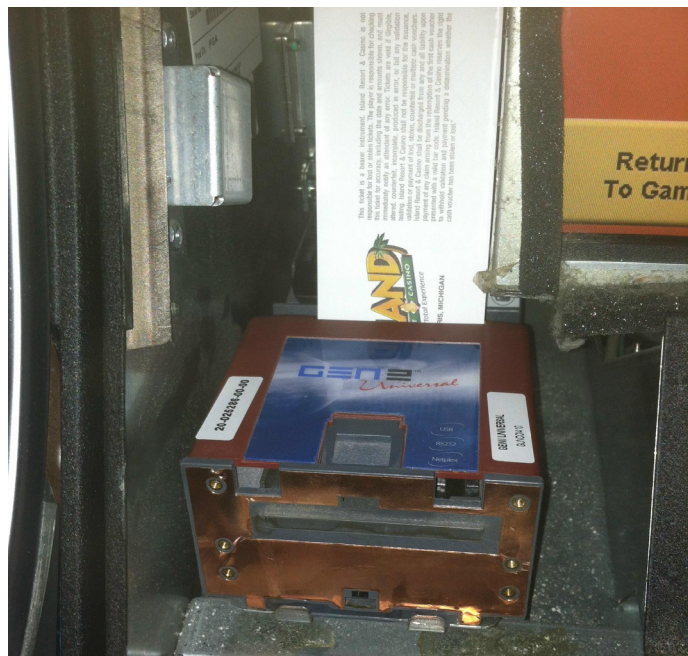
When I arrived at the game in which a GEN 2 Universal ticket printer was installed, the individual showed me the very dark tickets that were being printed. Since the print on the test tickets was dark, there wasn't a chance an actual ticket would read the barcode in a bill acceptor. Now the question was, should I try a quick repair, or should I simply replace the unit with a spare? Since I wasn't very busy at the moment, the printer was opened up to take a look. The only thing unusual that I could notice was some gunk near the thermal board print area. A dry Q-Tip was used to gently wipe away the foreign material. Next, a fresh Q-Tip was used to wipe off the part of the thermal board that prints on the paper. Some dark colored dust type material came off of the board, so it was wiped clean. The printer "remove ticket optic" located in the center area was also wiped off so it was clean. Game power was turned off, the printer was reconnected, and the game was turned back on. After the boot up process a test ticket was printed. This time it looked totally normal, no dark spots at all. Simply cleaning the thermal board area that touches the paper fixed the problem.

Quick & Simple Repairs #96

By Pat Porath

IGT G20 COM problem with SBX

We recently had a couple of IGT G20 games, connected to SBX, that lost communication with the server. The way we got it to function properly again was a RAM clear on the game. Do not "wipe" the hard drive when clearing RAM or every-



thing will be gone. Game program, max bet, the whole works will need to be downloaded if “wipe hard drive” is selected. The procedure we used is as follows: power down game, insert the “diagnostic key” along with “key 7” into the USB ports, then power up the game. After boot up there should be three selections to clear. Select only “cabinet clear” and “safe storage” then select “wipe.” Once again, do not select “wipe hard drive.” After selection is complete and the game shows that it is complete, power down the game and remove both keys. After powering up again, reinsert “key 7,” set game options such as SAS address 1, enable SAS protocol, enable G20 protocol and so on. Next, use the COM analyzer to make sure

communication has been re-established with the tracking system and SBX. This time, when we selected G20 protocol to test communication, it worked perfectly.

Bally Cinevision LCD Replacement Was a No-Go

I recently replaced an LCD monitor on a Bally Cinevision game. Anyone who has changed one

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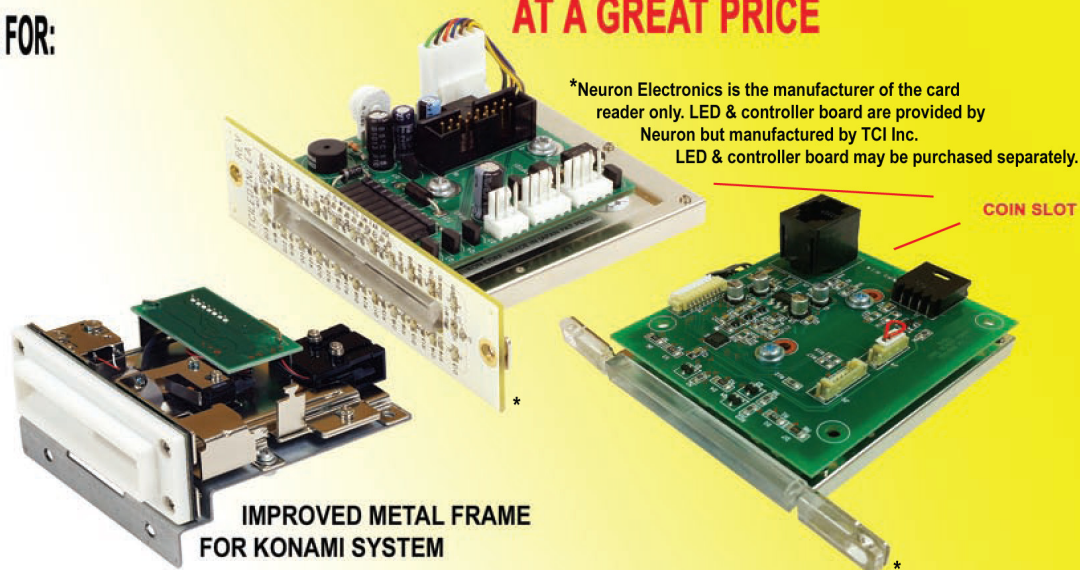
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knows it is a bit involved. I decided to take the main slot door off so it was out of the way (Yes, I removed the door from the game. Some techs partially disconnect it and pull it forward a bit, in the direction of the chair). Necessary screws were removed, the old LCD was taken out and the replacement was put in. As a note: Some replacement LCDs use a Molex type connector while others use a standard 110v machine or computer type power cable. Both types will work in the game.

Anyway, after the replacement LCD was put in, I turned on the game to make sure it worked. Even brand new parts have a chance (a small chance) of being faulty. After power was turned on and I looked at the game, NOTHING appeared on the screen; it was totally black. Luckily, I hadn't put the door back on the game yet. I tried a power cycle which didn't help either.

Now what? Instead of grabbing another replacement LCD, I thought why not reseal the main processor board? Sure enough, after I had reseated it and tried yet another power cycle, boot up text finally appeared on the screen. Could reseating the processor board have fixed the original problem of the black LCD? Well, maybe. I looked at it as the games have been on the floor for a few years or so and there

was a pretty good chance the LCD needed a rebuild (new CCFLs) anyway.

Speilo Black Screen

One morning, while checking the "Oasis Floor Logixs" program, I noticed a Speilo game that didn't have serial communication. I must say I do love the "Floor Logixs" program. It shows game serial communication down, Oasis communication down, if a poller has an issue, along with many, many other troubleshooting tools. So off I went to the specified location and found a Speilo game with a totally black LCD. The screen was black but the ticket printer bezel was lit up along with the bill acceptor. Now I knew there was a failure somewhere. Upon opening the main slot door, a few of the voltage

indicator lights were not lit, only a couple were. (Voltage lights indicate 12v, 5v, -5v - 12 and 24v.) I turned the game off for about 30 seconds (was told on Speilo games to leave main power turned off for about 30 seconds BEFORE turning back on to prevent premature power supply and or brain box failure in which a capacitor inside of the brain box explodes or so I've heard.)

When main game power was turned back ON, all of the voltage indication lights did light up but only for a second. Then most of them went out again. A reboot was done once again only to have the same failure occur. To me, the game acted like a device or something was causing almost a dead short so the bill acceptor and ticket printer



Regional Slot Tech Training

I was asked to hold a slot tech class at the Apache Casino in Lawton, Oklahoma from June 18-21, 2013. I have six available openings for the class. This four-day class will cover the following subjects:

Day One

Beginning Electronics for Slot Machine Technicians

Let's face it. When it comes to fixing slot machines, there's a lot of stuff that you just don't need to know. Why try to learn electronics from an engineering standpoint (the way they teach in college and technical schools) when all you need is enough electronics training to fix things?

This segment assumes that you have no previous electronics training and takes you through a simple, NO MATH look at electronic components, electronic circuits, schematic diagrams and more! Understanding electronics is easy when you learn the basics of how circuits and components operate.

Using a Digital Multimeter

The DMM is the single most important piece of test equipment you can use. The Casino School program shows you how to use the meter to make the tests and measurements necessary for fixing reel slots, video slots and other types of gaming machines.

Electronic Components

All of the individual components used in gaming machines are introduced. Parts such as resistors, potentiometers and capacitors are covered individually. Students learn how the components function in the circuits and how to test them for proper operation using the digital multimeter.

Schematic Diagrams

Schematic diagrams are the blueprints for electronic circuits. Learning to interpret schematic diagrams is a natural part of the Casino School. The schematic symbols are used throughout the course and students become familiar with schematic diagrams throughout the class.

Day Two

Diodes, Transistors & Other Semiconductors

Hands-on Transistor Testing Lab

Semiconductors are the basis for just about everything in today's gaming equipment. Semiconductor failures of all types are among the most common of problems you will encounter when fixing power supplies and monitors.

This part of the school takes a look at all of the different types of semiconductors commonly seen in gaming machines. We'll take a look at the operation of each component, along with testing procedures to determine if the part is good or bad. Students will have ample opportunities to practice their testing skills during the hands-on transistor lab. Replacement components will also be discussed. Never get stuck for a replacement part again!

Day Three-Morning Session

Soldering

Component removal and replacement is a better term for this segment. Good soldering technique takes practice but there are some tricks that can really help speed things along and minimize the chance of damage to the PCB. During this segment, each student will be provided with their own soldering station, solder and desoldering supplies. This equipment will be theirs to keep. We will be assembling a kit that includes all of the electronic components we have just studied.

Day Three-Afternoon Session (Continues through Day Four morning session)

Power Supplies

Power supplies are at the heart of all electronic systems and power supply failure is common in all of them. Slot machines are certainly not immune. It is not uncommon for a slot machine to have a half dozen power supplies working together. This module covers all types of power supplies, including linear power supplies and the Switched-Mode Power Supply (SMPS) found in LCD (and even CRT) monitors.

Day Four-Afternoon Session

LCD Monitor Repair

LCD Monitor repair is generally pretty easy thanks to their modular design. This segment covers the theory of operation of LCD monitors. There will be a presentation on the repair techniques including CCFL testing and replacement. Repair of inverter PCBs and Scalar (video) PCBs will also be covered.

The class assumes no previous knowledge of electronics. However, this is a SERIOUS CLASS and expect my students to be professional, show up on time and pay attention. We have homework and everything (just reading assignments, actually). Class begins at 9:00 am and ends at 4:00 pm daily with an hour break for lunch at noon. It is six hours per day of training.

The four-day class is \$995.00 per person This includes all textbooks and classroom materials. Each student receives their own digital multimeter (theirs to keep) and soldering tools and supplies as well as samples of electronic components. Transportation, meals and lodging are the responsibility of the student. To register, visit the website at slot-techs.com. -rf



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were removed to see if either one was causing issues. Yet another power cycle with the same failure, appearing to be a “voltage loss” problem, usually meaning power supply problem, at least so I thought. I didn’t see a spare replacement power supply on the shelf in the shop so the info was passed onward to another tech. Maybe I had missed or overlooked something? It sure wouldn’t be the first or last time. LOL A bit later in the day, the game was running again. Come to find out a co-worker replaced the brain box NOT the power supply. A replacement brain box fixed the problem and the game was running once again.

Slant-Top Aristocrat Locking Up for Hand Pays

The model is an Aristocrat Mark 6 slant top, not the Viridian style processor board that has the “smart card” and CF cards. This model only uses EPROMS. When everything looks good and tests OK but the game still locks up for hand pays, we RAM clear the main game board to resolve the problem. Even though the SPC board communication LED is flashing rapidly, (which shows good COM) and game to Oasis Sentinel COM is verified by opening and closing the main slot door. The Oasis display will show OPEN and CLOSED. No errors will appear on the

screen, everything will look good in the ticket printer area such as paper in the print head and paper fed correctly. Even rebooting the Sentinel and game doesn’t help. If EVERYTHING appears to be communicating and looks good and it STILL locks up for a hand pay on all cash outs, a RAM clear will fix it. After game options are set, such as setting the SPC board to address 1, the game will once again print tickets.

WMS Bluebird XD, UBA Wouldn’t Cycle Properly

While taking a look at a UBA problem on a WMS Bluebird XD, I had a difficult time finding the problem. Most of the time with a UBA (JCM UBA bill acceptor) WMS, IGT, Bally, Ainsworth, Aristocrat, Aruze, or whichever, reseating the stacker box or replacing the stacker box or replacing the bill acceptor fixes the issue. Not the case this time. Stacker boxes were swapped, bill acceptors were swapped, and the game was rebooted. Since the game was displaying a “bill acceptor com error” on the screen, different USB ports were even tried on the CPU board. The gears looked OK on the bill acceptor housing unit (a.k.a T.R. Stand).

What was left to swap or check out? After reseating the stacker box and bill acceptor numerous times, the only thing it would do

once in a while is a single click noise. About the only thing I could think of off-hand was wiring. We had experienced a Bluebird XD bill acceptor problem in the past. When it wasn’t something easy, the problem ended up being a bad wire harness from the bill acceptor to the motherboard area so why not take a peek at connections and wiring? Everything appeared to be OK and snug at the motherboard area of the game. No bent pins were on the bill acceptor connector game side. Software options were also checked, which were correct.

While looking around the bill acceptor area with the unit removed, I noticed a Molex type connector was a little bit loose in its socket, located just to the right of the game LCD above where the bill acceptor sits. Game power was turned off, then the suspected loose connection was put into its socket. Within a few minutes of turning the game back on I finally heard the “normal cycle sound” of a UBA. After the game fully booted up and all of the doors were closed, the error cleared. A blank ticket was tested to make sure the unit did grab it and not have any more errors. No doubt the loose connection was the problem.

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For schematic diagrams, service manuals, software, etc., visit the Slot Technical Server at slot-tech.com

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Slot Tech Interesting Product

DIGITAL DYNAMICS SOFTWARE OPERATES IN EXOTIC LANDS WITH TECHNICAL CHALLENGES BIG AND SMALL

Company Specializes in Getting International Gaming Devices from Around the World and Across the Ages to Speak with Host

Ever find yourself in some faraway land trying to get directions? Imagine how much more difficult that might be if you weren't just in a different country but you were trying to get a computer from that country to work with another computer from a different country. Now imagine one of the computers is state-of-the-art, and the second one was made while you were in high school. No problem for Tony Antonucci and team members at Digital Dynamics Software, Inc. or DigDyn as the company is known to friends. They actually think those kinds of challenges are fun.

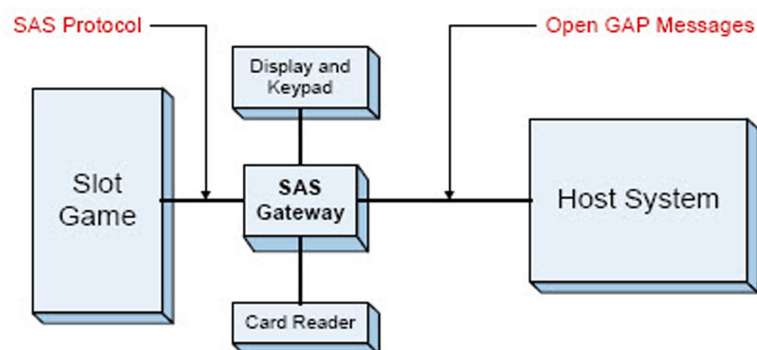
Think for a moment of what exactly is on the table for a Caribbean casino or a Central American operator who has some really exciting machines in the mix. If those machines can't speak freely with the house system, there can be no player's club, there's no modern oversight, no way to award comps in a disciplined, business-like manner. As long as the casino can't track play at every single machine, neither the players nor the house will be able to avail themselves of floor-wide accounting and ticketing from their new machines. But with comprehensive communications, a collection of machines can be instantly turned into a modern casino floor with all of the promotions and point tracking (and comps!) that players have come to expect. So there's a lot riding on being able to get the machines to work flawlessly with the casino's host system.



The company produces the Digital Dynamics **SAS Gateway**. From the standpoint of the casino, this makes communications about as simple as possible. No matter what the age of the machine, no matter what part of the world it was built in, the folks at DigDyn can make those machines speak to the host system. Their **SAS Gateway** is a generic "SMIB," which has an open protocol on the network side. Thus, it can get a lot of data out of the machine in order to tell the casino as much about the game play and the player as possible. The device can be used to build a

back office system that includes accounting, ticketing, funds transfer, player tracking, etc. The device optionally supports a magnetic card reader and/or an LCD display. It can connect any slot machine that supports SAS to an operator's system.

The goal here is interoperability and make no mistake about it, the SAS Protocol is a tough nut to crack. Digital Dynamics President Tony Antonucci said the way the folks at Dig Dyn explain it to clients; "It might make us sound like the ultimate geeks, but we enjoy this stuff. If it was easy, everyone could pull



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it off. We like the fact that we are experts in a field giving our clients tremendous control over monitoring play on their casino floor irrespective of what part of the world it may be in. No matter what language the owners speak, if their machines speak SAS, we will give them the interoperability everyone is after.”

When it comes to the casino floor, there is only one measure of success and it is pretty straightforward; it all comes back to that word “interoperability.” Everything needs to talk to the host system flawlessly. The machines are already using the SAS Protocol but you would be amazed at the amount of time that can be wasted and money spent while the casino’s best tech minds are walking in circles on the casino floor mumbling, ‘it’s supposed to work, it’s supposed to work.’

Think of the folks at DigDyn as the great communicators of the casino floor. Somehow, somehow, they will get that machine to interface, no matter where it was built, no matter what its age (within reason) and get it to talk to the modern casino’s host system. If that doesn’t sound like enough of a challenge for an out-of-town traveler confronting a machine he or she has never seen before, Digital Dynamics will even assist the casino in establishing its own host system. That’s no small order when faced with the United Nations of slot machines from across the ages.

Digital Dynamics sells a Host Software Development Kit (SDK), which provides a good starting point on the development of a host system. This allows operators to build a system that functions the way they want at a fraction of the price of a system from the “big boys.”

On the other side of the interoperability equation is to get all of those systems, the machines, the host system to speak the universal language of SAS. DigDyn also provides its SAS Engine, the software that finalizes the last interoperability hurdle. The best part of DigDyn’s SAS Engine? It’s been through the lab approval process world-

wide dozens of times.

While lab approval isn’t a concern in all parts of the world of gaming, when lab approval is necessary it is a huge concern. Because DigDyn’s SAS Engine has been used on virtually every continent on earth and is fully lab tested, using this widely accepted tool translates into far fewer challenges for owners and vendors. DigDyn’s ultimate goal is to simplify interoperability while minimizing potential glitches in operations and compliance.

Some of these slot machines can take on a personality of their own. Explains Antonucci, “In some of these casinos, these machines, even the older machines, can take on a different, very important attraction. They may not be too impressive based on the competition as you know it, but that machine may be a top earner in northern Africa with a very loyal following. We don’t worry about the details. If our client wants to include that slot machine in the mix, we will do everything we can to accommodate them and believe me; we are in the habit of getting it all to work.”

Some slot techs might look at that scenario and approach management saying, ‘it doesn’t fit in the mix.’

“From Dig Dyn’s perspective, those aren’t our calls to make,” said Antonucci. “If management wants it to work, we start addressing how to make that happen. It’s a matter of where you are coming from. If we say we can get it to talk to the host system, it’s a pretty safe bet that slot machine and the host system are going to have a long, closely aligned digital relationship.”

“The place where we really shine is follow through service,” said Antonucci. “I think a lot of people in the tech world are of the mind that questions are best answered by posting FAQs on their site. It makes it easier on them. We don’t see it that way. From our perspective, we see glitches as an opportunity to keep the dialogue open with our client and to keep that relationship alive.

We are unique in that, when you have a question for us about our devices or our software, you are probably going to talk to the person who actually wrote the code. We don’t get stumped. We have probably answered the same questions before. Referring a client to a website for answers just doesn’t seem like much in the way of customer service. Of course the one constant in all things related to the technology business is in fact change. If you are going to be in the driver’s seat, you probably need to keep a close eye on the direction that your clients are headed.”

Next? One of the larger questions that loom on the horizon is the phasing out of SAS as an industry standard. There are a lot of hours that will come with that change. Antonucci says it’s already part of his playbook.

“We will have a simple, straightforward migration path for our customers,” said Antonucci. “We are expert at avoiding headaches for them. We are in the business of anticipating and solving technical problems before they present themselves. It’s our core business.”

ABOUT DIGITAL DYNAMICS SOFTWARE

Founded in 1983, Digital Dynamics Software (DigDyn), is a technology firm that provides clients with gaming products and related engineering services. Staying current with the latest technologies, DigDyn provides a unique combination of technology and services to facilitate the implementation of industry standard gaming protocols as well as emerging gaming protocols. DigDyn’s continued success comes from working closely with their clients in developing and deploying high quality engineered systems. For further information, call (847) 330-3830 or visit www.digdyn.com.



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

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

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