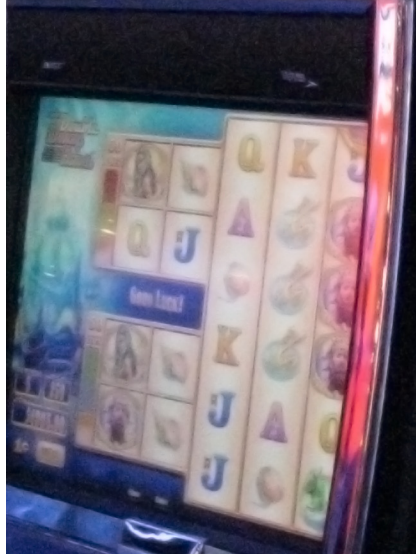# SLOT TECH
## MAGAZINE

**Slot Machine Technology for the International Casino & Gaming Industry**

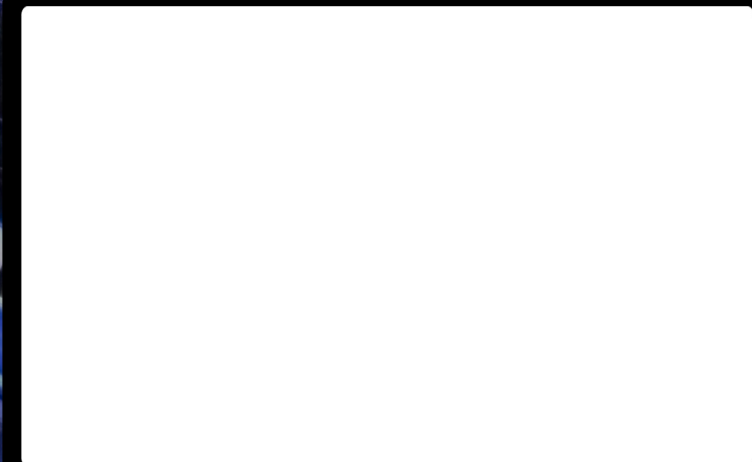# IGT Communications
# Board Test Fixture
# Someone That Cares

On the cover: WMS Gaming showed
these slot machines at G2E 2012

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# Slot Tech Magazine

**Randy Fromm**

This month, Slot Tech Magazine introduces you to my friend Darrin Pachman, late of Trinidad and Tobago. Darrin is an industry veteran slot tech and slot director who offers us his expertese, not in the actual workings of repair but rather in working on the perception of your labor as it relates to everyone else in the casino. It's an interesting read. Thanks for the contribution, Darrin.

Herschel Peeler is back! Herschel Peeler is back! Although the industry has moved ahead with its networked platforms, there is still plenty of legacy equipment in situ that requires maintenence and repair and since that's what Slot Tech Magazine is all about, Mr. Peeler has designed and built a little "dumb" test fixture that enables you to test all of the different variations of the IGT Comm board. Testing boards can be a real challenge unless you have a way to exorcise the circuits to see if they work properly. The testing process also (generally) pinpoints the defect down to a specific circuit or component as well. Thanks, Herschel. We appreciate the contribution.

I have a regional (five-day) slot tech class coming up in San Diego, California in March and in Lawton, Oklahoma in June. TechFest 27 is in May at Mystic Lake. This TechFest will include a presentation from WMS on their buttons! Please see the website at slot-techs.com for enrollment forms and class schedules.

That's all for this month. See you at the casino.

*Randy Fromm*

Publisher
Slot Tech Magazine

# Someone That Cares

### By Darrin Pachman

Having over 20 years in the Slot Machine industry starting as a Technician Trainee and working my way to Slot Director of a multiple location operator, I have handled all aspects of slots management. I started in the technical side in Atlantic City where I was the youngest Slot Technician in the city at the time. Whenever I went to Caesars to do a service call, they had to give me a security escort because I was only 19 years old at the time. All the other casinos assumed I was of age since I worked for a major machine distributor.

I recall one night I was on an emergency service call to Trump Castle where I had to reprogram a Big Bertha progressive. Now, this was 1985 and we used this giant portable computer from Radio Shack. It used a cassette tape to store the program that had to be loaded into the computer each time you used it. I remember this call well because I just finished listening to some Grateful Dead with my friends and ...

So here I am, programing this with the gaming commission, shift managers and security all around watching this kid with this computer thing. Had they only known I was on the same planet as they thought this technology at the time was from! That was then, this is now.

I do not want to talk about the shortcut to fix the burned-out power supply or how to adjust the sensitivity on an optic encoder or even how to properly check a capacitor for ESR. Those subjects are covered well and good in Slot Tech Magazine and in countless articles on the Interweb. My article is going to be about fixing you.

### Slot Techs Are Valuable

From the outside, it is easy for management to see the technical department and its staff members as a waste of resources. I want to provide you with insight, ideas and objectives to fix the negative perception that technicians have within an organization. I want to help you to show your value to the organization, what you can do to stand out and to be the one that the operations staff comes to with their "issues." You can be the one they call and the "Someone That Cares."

In addition, for those of us that have been turning wenches for some time, the machines of today are different. Technicians must be less mechanical and more logical in their thinking and troubleshooting. Technicians need to show their value to the organization in other ways besides waiting for something to go haywire.

That is my goal, to help you to show the organization your value besides sitting around the shop waiting for a call. With the average slot floor having over 1000 machines, I can tell you, on your floor there is an insert wrong, a button light out, candles backward, lock cylinders protruding from the lock casing and so on. I have yet to walk on any casino floor and found everything prefect, even with the floors I run.

*Editors Note: Perhaps Darrin hasn't visited Mystic Lake Casino!*

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**Dual cold cathode lamp assemblies for:** Atronic 17" LCD & Koanmi 17" LCD, & WMS 19" LCD & Konami CCFL Edge-Lit Belly Glass

**Triple cold cathode lamp assemblies for:**  WMS 17" and 18" LCDs

**For IGT**

#8500 - Single cold cathode lamp assembly for IGT 6.2 inch LCD

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

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

**FOR BALLY**

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

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

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

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

#1240 – 6.2" Hitachi LCD $TX16D11VM2CCA

**FOR KONAMI**

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

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

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

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

**FOR WMS (Williams)**

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

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

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

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## The First Fix

First thing you need to do is clear your mind of the knowledge of your floor layout. Stop and close your eyes as you enter the gaming floor, wait 10 seconds or so, now open them.

When you do this, try to see the floor as if everything is new and therefore things that are out of place will not seem consistent anymore and acceptable, they will seem out of place and before you know it you're in a garden of roses with many weeds around you that you never saw before but were always there.

## The Plan

Create a list of each bank of machines on your floor. Break the floor up into small zones of five banks. Each day, take one bank and look at each machine closely. You can do this with players on the machines. Look for something out of place: Do the inserts match the game and settings for your casino? When a player is playing the game, are all the lights lighting up for them? When they touch the screen, are they having issues? When they insert their bills, are the bills rejecting? Does the card reader accept the player's card the first time? Touch the buttons (no player on the machine) are they loose? What about the locks? Look at them. Can you push on them and the cylinder slides in? Put your

hand on the reel glass. Does it slide? What about the handle, is it loose? Does the bezel on the Ticket printer and BV align correctly?

Now you're going to say, "We do Preventative Maintenance and check all these points"

I say, "Well (as I put my arm on your shoulder) I'm sure you do but tell me something, does your car wait for you to bring it to the mechanic and then it breaks down or do you bring it to the mechanic when it breaks?"

Let me answer that for you. It breaks when it's ready to and not when you want to fix it. This is not about the type of PM service you do, this is about being proactive in what you do, showing your value to your organization and being seen by the supervisors and managers that you have a value to the organization.

OK so you did this, you identified some minor issues and corrected them. Now, what do you do the rest of the week? You let the Shift Manager know that you want to talk with the Supervisors and Floor staff in your area to ask them if they have had complaints about machines issues from customers.

Let me explain why you want to tell the Shift Manager you want to do this. The last thing you want is the Shift Manager seeing

you talking to their floor staff and then the Shift Manager coming to you, to tell you to go away so the floor staff can do their work. So before you jump into this, let the Shift Manager you are only going to be a minute or two with each of them in your zone. Many times the operations staff will be the ones to see or hear of issues and guess who they tell? Yep, 'No One.'

As a Slot Director, when I asked a supervisor once who they told about a machine issue they informed me about that was recurring, this supervisor told me 'No One.' I went OK, thanks. Then I sent an email to the entire operations and technical staff.

*"Please make note the following, 'No One' is no longer a part of this organization. Anyone caught speaking, telling or sending an email/memo to 'No One' will be terminated without warning. Further all information that was given to 'No One' is to be forwarded to 'Someone That Cares.' Further take note, Someone That Cares' is hard to find at times but please be persistent in your efforts and do not divert back to 'No One.' Thank you for your understanding and assistance.*

*Signed, 'Someone That Cares.'*

**Darrin Pachman**
**dpacman@slot-techs.com**

# IGT Communications Board Test Fixture

### By Herschel Peeler

This is the four, five or six channel Comm Board in the distribution box of 960 series games, both Game King or S2000. It comes in many variations and part numbers. This test fixture tests all of them I have found so far. The board has the possibility of three or four wired channels and one or two fiber optic channels. The board can be powered from any of three sources. The test fixture covers all of them.

No single game uses all the possibilities so testing the board in one game will not necessarily prove it will work in another game. The test fixture and this procedure are also educational if you are vague on RS-232, RS-485, current loops or fiber optic systems.

## Power

Older boards were powered by AC from a transformer in the distribution box that put out about 15 Volts, center tapped, through a 3-pin connector. The next generation was powered by 5 Volts from a power supply in the Distribution box through a 2-pin power connector. Some more recent designs have been powered by +13 Volts coming in over the 26-pin ribbon cable. The test fixture has all possibilities here covered.

## The Board in General

There are many variations and part numbers for this board so schematics will vary but we can see some similarities in designs. The game interface is +13 V and ground digital signals so switch inputs are simply switches from +13 Volt or ground. 4504 Voltage Level Converters change these to +5 and ground for the rest of the circuitry.

The RS485 interface is usually an LTC491 or MAX491. The RS-232 interface chips provide their own +V and –V for the RS32 line. The boards that run off of AC have an on-board regulator that drops the
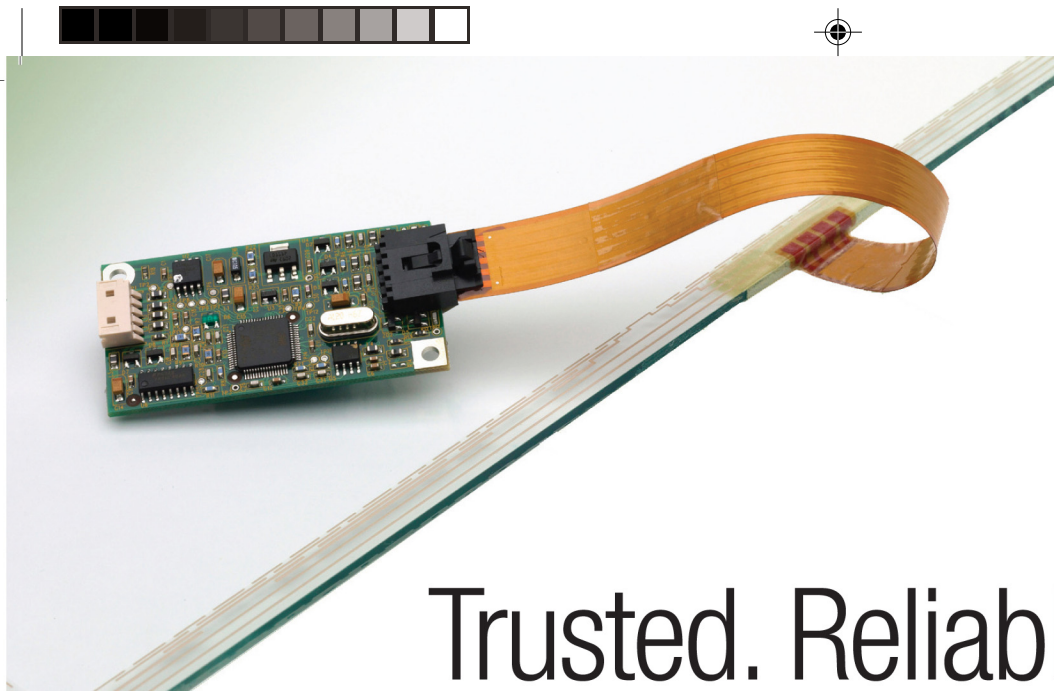
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rectified voltage ("+13 V" line on the board) down to +5 V.

No parts on these boards are proprietary. All parts are available over-the-counter.

## Channels

The 960-series games have eight communication channels (1 through 8). Up to six of these come into the Communications Board as channels "a" through "h." Channel "a" is usually primary SAS and is an RS-485 port with MODEM-type handshaking (DTR and DCD). In boards with two fiber optic ports, "a" is the second fiber optic port. Channel "c" is an RS-232 port with flow control (RTS and CTS). Channel "f" is an optional second RS-232

port not used on most boards. Channel "g" is the progressive (current loop) port. Channel "h" is the standard fiber optic port. Each will be covered in more detail.

The game has a Communications Analyzer built into the diagnostics that is very useful for troubleshooting. Best application of this requires a loopback on the channel you are testing. This allows the output of that channel to talk to itself testing all of the game circuitry. These loopbacks are required for the test fixture.

## The Test Fixture

The test fixture is not complicated. It is basically switches and lights that

simulate the game outputs and inputs through the 26-pin ribbon cable.

## Channel 1

Referred to as Channel "a" in the board schematics, this is usually Channel 1 of the game and is primary SAS. This is an RS-485 port on most boards. On boards with a second fiber optic port, this second port is "a." On the RS-485 configuration we have Direction Control (DIR), Data (TxDa and RxDa) and MODEM Control (DTR and DCD). TxDa is Transmit Data on Channel "a," data coming from the game MPU out to some system. This goes into the external system as its RxDa. RxDa is Receive Data on Channel "a," data coming into the game from



Title: XComm board Test Fixture
Size: B  Document Number: Design 134  Rev: 1
Date: Sunday, February 03, 2013  Sheet 1 of 1

March 2013

Title: Typical RS232 Interface and Lopback
Size B
Document Number Design 136
Rev 1
Date: Saturday, February 09, 2013
Sheet 1 of 2

some external system. This comes from the external system's TxDa output. DTR is Data Terminal Ready.

This is a signal put out of the MPU telling an external system it is on-line and ready for operation. This

eventually goes to the external system as a DCD signal. DCD is Data Carrier Detected which means the



Title: Typical RS485 Interface and Loopback
Size B
Document Number Design 136
Rev 1
Date: Saturday, February 09, 2013
Sheet 2 of 2

external system is alive and on-line. This comes from the external system's DTR output so testing this channel requires a loopback that ties TxDa tied to RxDa and DTR tied to DCD, allowing the port to talk to itself. RS-485 is a differential signal standard so there is a "+" and a "-" side to each signal. Setting a switch sends the signal. The result coming back lights an LED.

This is the 10-pin connector, J81.
On some designs with a second fiber optic port Channel 1 may be this second fiber optic port.

## Channel 3

Referred to as Channel "c" in the schematics, this is an RS-232 port with Flow Control, RTS and CTS. TxDc and RxDc are the transmit and receive data. RTS is Request to Send. This output is telling the external system the game has information ready to send. CTS is Clear to Send. This is a signal from the external system telling the game it is okay to send the information. In a system switch there may only be one processor but many communication channels. Since the processor can only talk too one channel at a time it organizes itself using these RTS and CTS handshaking signals. This is the 5-pin connector, J82.

## Channel 6

Referred to as Channel "f" in the schematics, this is an optional second RS-232 port. No handshaking signals are provided. Flow Control is accomplished by ASCII control codes (X-ON and X-OFF). Only a simple loopback between TxDf and RxDf is required. This is a 7-pin connector, J5, not found on all boards.

## Channel 7

Referred to as Channel "g" in the schematics, this is the typical Progressive output to older progressive sign systems. This is a current loop design. The inputs and outputs are opto-isolated. Again Prog

Out is simply tied to Prog In but we also need to supply power to the external aide of these circuits. This is the 6-pin connector on the board, J85.

## Channel 8

Referred to as Channel "h," we have TxDh and RxDh. This is typically connected to the fiber optic Data Collection System, WAP (Wide Area Progressive), CVT or location safe system. The loopback required is a short section of fiber optic cable. On many single fiber optic port designs there is a second fiber optic output that echoes what is transmitted on the other channel.

Title: Progressive communications
Size: B  Document Number: Design 137  Rev: 1
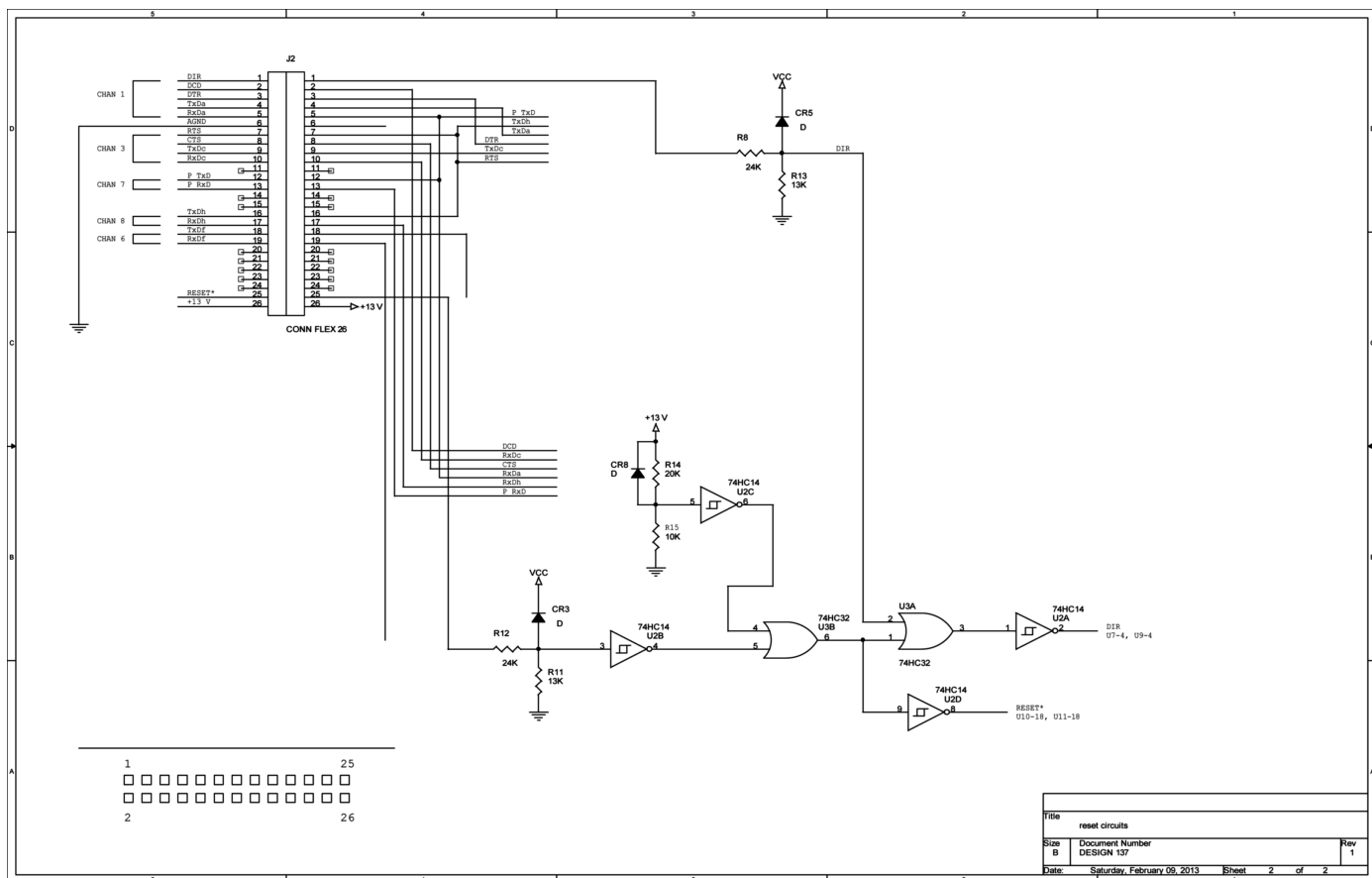Date: Saturday, February 09, 2013  Sheet 1 of 2
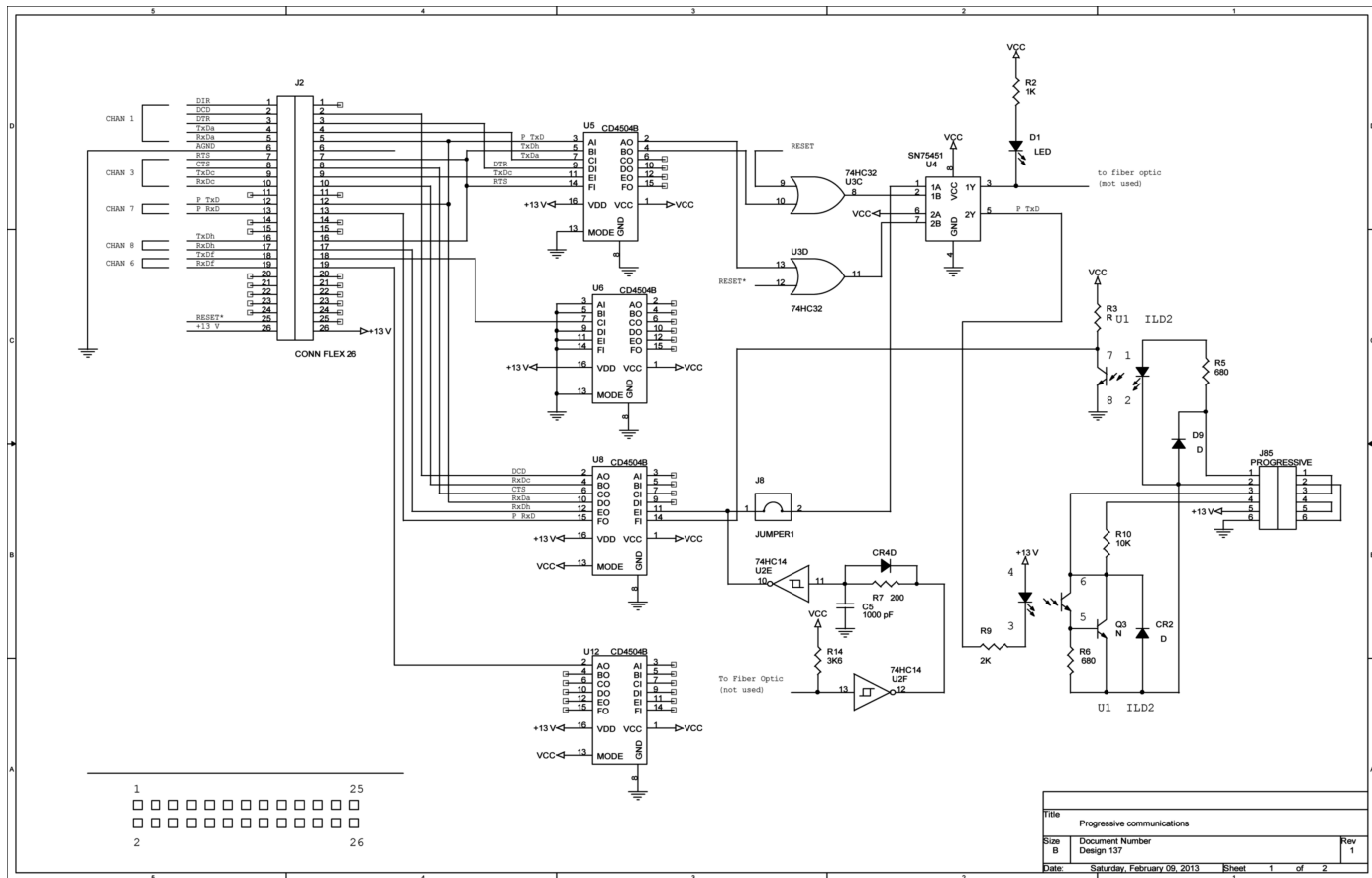
Worth noting here, there is a jumper "E1" that disables transmitting on the fiber optic channel while something is being received. This jumper must be removed for the loopback test. An LED on the board lights when data is being sent out



Title: reset circuits
Size: B  Document Number: DESIGN 137  Rev: 1
Date: Saturday, February 09, 2013  Sheet 2 of 2

the fiber optic port. Some boards have no fiber optic connectors at all. The board LED still lights but there is nowhere for the signal to go and no signal to be received.

## Testing the Board

Connect the loopbacks as required for the board. Connect the appropriate power plug and the 26-pin ribbon cable. Power on. The LED on the board should light.

## RESET

The typical schematic of the board has been broken down into sections to make troubleshooting easier. Some parts common to different sections are duplicated in the schematics. Turning on RESET should turn off the board LED. The board has two sources for a Reset signal. There is the input coming from the switch through the ribbon cable and a "+13 V Failure" circuit. On some boards a jumper is required to provide this +13 V power to this circuit. Consult the schematic for the specific board you are working on. The circuit shown is only an example and may not apply to your specific board.

## Channel 1 Testing

Enabling the DIR input enables both RS-485 interface chips and the RxDa LED should follow the TxDa switch. The DCD LED should follow the DTR switch. Disabling DIR should kill both LEDs. This RS485 port is designed to drive a long distance but may only go to a cable in your SAS system. Whatever is connected to channel 1 in your casino goes here. This is set up in configuring your comm channel SAS menu. This is usually primary SAS but doesn't always have to be.

## Channel 3 Testing

Channel 3 should be defeated by reset. The RS232 interface generates its own +V and –V for the RS232 line. RxDc should follow the TxDc switch. The CTS LED should follow the RTS switch. The +V and –V the interface chip generates can vary from 6 Volts to 9 Volts. This is only intended to drive a short distance. This is often Secondary SAS if you use it.
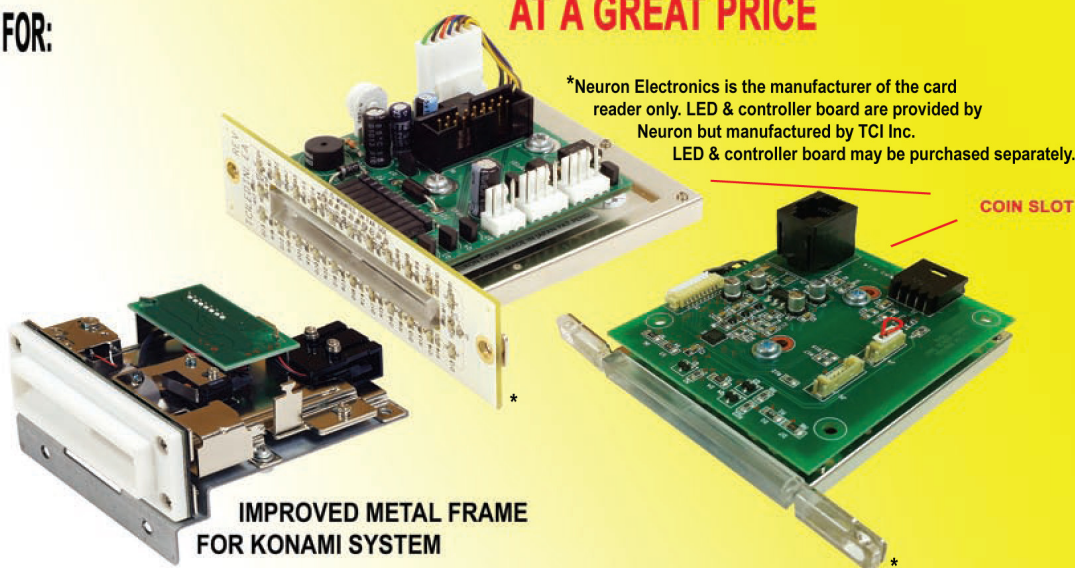
## Channel 6 Testing

IF USED the RxDf LED should follow the TxDf switch.

## Channel 7 Testing

This is the old style progressive sign output. Most modern systems use a serial port for the progressive and you may not even use this port. Being a current loop design, voltage readings can be misleading. It is current flow that counts more than voltage level. The chip used is popularly an ILD2, dual opto-isolator. On the transmit side the cathode of the LED should be about +5 or +13 (which ever is used on the anode, it varies with board design) when off and drop about 1.2 volts from that when on. With the loopback connected the output of the opto-isolator, pin 6 should go to about 0.6 volts when on (limited by Emitter-Base of the transistor) and about 1.5 V when off. When off the output tries to go high. How high is limited by the LED on the receive side, so we will not see a +13 V at the output unless the Prog Tx line is open. If working the P Rx LED should follow the P Tx switch.

## Channel 8 Testing

Remove the jumper in the fiber optic circuit (usually E1) for loopback testing, if you use it. Reset should defeat Channel 8 operation, otherwise the RxDh LED should follow the TxDh switch. If no fiber optic jacks are used, the LED should still follow the TxDh switch but the output goes nowhere and there is no input for the RxDh LED.

- Herschel Peeler
hpeeler@slot-techs.com

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# Quick & Simple Repairs #93

### By Pat Porath

**IGT Trim Line SBX "No Games Enabled"**

When I arrived at the game, I was told it had a "green screen" error and it was reset with the jackpot reset key. I rebooted the game, then it came up "no games enabled." Since it was an SBX game (Server Base eXperience) it may be tricky to "get" the game software from the server. A few of the game options were checked out and in the "enable game" area, all three that were SUPPOSED to be enabled were disabled AND had a symbol of a red key lock next to them. This indicated the games were locked. On another check of game settings and options, in the protocol area, a small icon read "reinitialize protocol" so I pressed it and it seemed to do its thing because I heard the IGT "high tone ding" when something is saved or initialized. Going back to the "enable games area" of options, now the enabled

games had an "unlocked" symbol next to them. But they would not allow any to be enabled. What was possibly needed? EKey 7 was inserted into the brain box of the game. This allowed me to enable and set up the three games. A phone call was made to see how they were supposed to be set up (such as max bet, lines, etc). After setting up options, all looked good. After the main slot door was closed, games appeared on the screen. Yea! I had games. A co-worker arrived to see how I was doing because I admit I'm not really sharp on SBX game set up. He showed me how to verify communication FROM the game TO the server. It was quite interesting.

First, press the white test button located on the brain box, then DIAGNOSTICS, COMM ANALIZER, then G2STRANSPORTG2S. Next press REINITIALIZE PROTOCOL, at the bottom of the screen press the START button. If the game is in fact communicating with the server, some letters and numbers will appear in the top area of the screen and on the bottom, it will dis-

play "COMMS ONLINE." This verifying procedure was performed twice just to make sure the game did have good communication. I was told simply by pressing the REINITIALIZE PROTOCOL button (which is located under the protocol menu) the game and server started communicating once again. If the COMM ANALIZER test failed, it would be possible game information would have to



IGT top of screen in diagnosic menu

Protocol Control Setup

PROTOCOL THAT CONTRO
AFT Bonus Transf
AFT Debit Trans
AFT In House Trans



IGT buttons to check communcation

Diagnostic — Comm Analyzer
Machine Data Export — Device
Player Identification — Game
Touch Calibration — System Monitor
Verify

IGT SBX Protocol Button
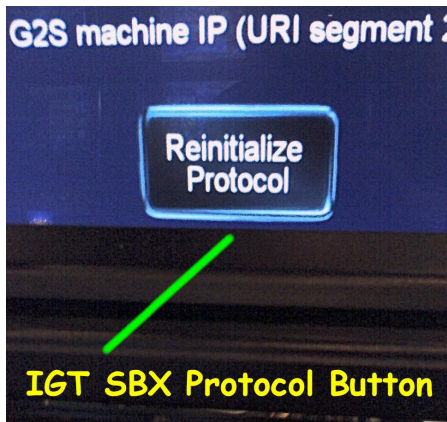
be re-sent FROM the server TO the game. The game may need to be RAM cleared to "reinstate" all of the COM items such as the "mac address ID number," "Ethernet protocol number," and probably some others. Since selecting REINITIALIZE PROTOCOL and using eKey 7 for set up, the game was tested and worked perfectly.
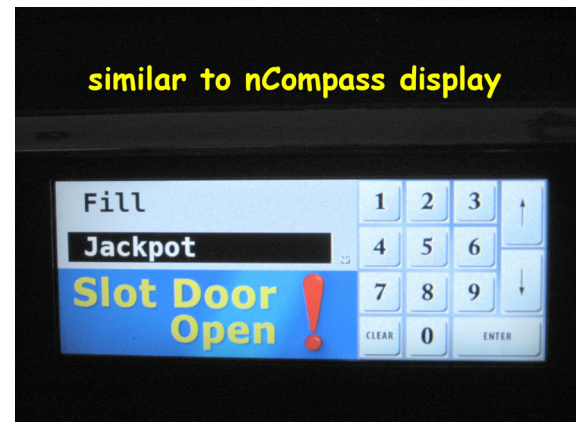
## Oasis nCompass Touch Screen Problem

First of all, what is Oasis nCompass? It is similar to the Oasis Sentinel III, only better. On the outside of the game, the only way to tell, now the card reader is illuminated. A blue color card reader bezel indicates an "idle" card reader (no card inserted). A green color indicates the card has been successfully read and a red color indicates a card read error. Ncompass displays are different from the Sentinel IIIs. The main connector has a different number of pins and are not interchangeable.

Back to the touch screen problem. We had received

eight, Aristocrat Viridian games with Oasis nCompass was already installed. The games were fired up, optioned and so on. When it came time to "global" one of the games, it appeared the Oasis display had a touch screen calibration issue. Sometimes, when a card is inserted into a card reader and removed three times very fast, the Sentinel will automatically enter into calibration mode. This display would not calibrate correctly. In other words when touching the "+" symbol, the touched area was way out of whack. Unfortunately the game could not be released to the public until it passed testing. If a game doesn't accept "promo cash." accept tickets, print tickets, etc., it fails the test. Since the

display did not work properly, the Sentinel couldn't be "globaled" and the game could not go in play because the Sentinel would not be communicating with the game.

It was time for some good ol' swaptronics. The display was first swapped with the game next door, then the video cable. Neither made a difference, it still would not calibrate. I was told EVERY-THING had been replaced with new such as the display, cables, power supply, and the nCompass box


similar to nCompass display

itself and it still wouldn't calibrate correctly. What the heck was left? All Oasis nCompass items had been replaced, some even twice. I thought of something and checked it out earlier a little. What if the display cosmetic faceplate was touching on the touch screen just enough to throw it out of whack? In other words, the decorative faceplate that goes around the display could be touching it just a little bit, indicating a "touch" where it actually presses on the display. Power was removed from nCompass along with REMOVING the display from the game but still keeping it connected. Once power was restored, and after boot up, the darn display calibrated perfectly. To prove my theory, the faceplate was removed from the game and the display put back into the game. It calibrated again perfectly, no doubt the faceplate was definitely pressing on the display. Now the game could be "globalled", tested, and put into play (which it was). At a later date I "tweaked" the faceplate and put it back onto the game. No doubt a learning experience.

## WMS "Game of Life" Bonus Error

A call was made over the radio that a tech was needed to the WMS "Game of Life" area and it was "very important." When I arrived, the customers didn't look

very happy. All four of the games were in the middle of a bonus round when all of the sudden the large overhead sign went dark and all of the games had a "call attendant" error. Right away I called our WMS field tech and asked what to do. He stated there was a very good chance the "media controller" had an error and needed to be rebooted. Located under the overhead sign on the right hand side, behind a black door was the controller. A small door on the controller was opened to access the media controller power switch. It doesn't look like a power switch though, it looks more like a large push type Cherry switch. The tech gave me instruction as to what to do. Hold in the switch for a few seconds allowing the controller to turn OFF (You should be able to hear the cooling fan stop). Next, simply press the "power switch" again for a second to turn the unit ON. The cooling fan should turn on, indicating power. Within 15 seconds, text appeared on the overhead sign, which shows boot up. Probably within five minutes or so, the bonus round started over from the beginning and the "call attendant" errors cleared from the games. A customer stated that there were around 1600 credits on the sign before it failed and asked what would happen to that? I asked her to wait and we would see together what happens during the

bonus round before making any decisions. When the bonus got further along, it I was told by a customer it was "replaying" what happened, then kept going past the area where it failed. So far it looked good. At this time the sign indicated around 1800 credits so I wasn't concerned with any "lost credits." Once complete, all the customers were happy again. I called back our WMS tech and thanked him profusely. That was my first time rebooting a "media controller" for a WMS Game of Life progressive. Now I know what to do if it happens again. A simple power cycle fixed the problem of "call attendant" errors on the games and got the sign working again.

## WMS Bluebird, Black LCD

A bad LCD or a bad game power supply on a WMS Bluebird? A few different indications show if the LCD may be bad or the game power supply. First of all, the game is an upright Bluebird 1 with the 330 watt square power supply, not the newest version with the rectangular type unit. When power is turned ON, the cooling fan located on the LCD doesn't spin, there isn't a lit power LED on the LCD, and the cooling fan located on the game power supply doesn't spin. All of these symptoms point to a bad game power supply. After it was replaced, the

LCD lit up beautiful. On the other hand, if the power supply cooling fan was spinning, along with the cooling fan on the LCD, and the LCD power light was lit up, I would say a bad LCD if the screen was black. Sometimes if a LCD is bad they will show graphics for a second, then go black. To me, this is also an indication of a bad LCD. Of course before replacing it, check the power and video connections at BOTH sides, the LCD AND the game side. I've seen bad power connectors on the LCD side where the end of the power cable had a dark brown spot in it. The possible upgraded replacement power cable has a blue connector on one end, where the original has standard white connectors.

**Kortek 40'' LCD From IGT Party Time Sign**

I don't know what the deal was but recently, we had problems with three different 40'' sign LCDs, located in different locations of the gaming floor. Was it sign problem week? One of them was replaced with a spare, an other was repaired by a bench tech and the last one I took a look at. The back of the Kortek 40" LCD was taken off to see if an easy replacement of the power supply could be done. When power was applied to it, graphics would only appear for about 10 seconds then fade out. Thinking the power supply

replacement WAS the correct one, I tried it, applied power but no changes were made. If it was working properly in the shop, without a video signal generator connected to it, I thought I should have at least "no signal" appear. Or when the "menu" button is pressed, the menu options should appear. At least something should. Nothing appeared at all after replacing a power supply board, the "AV" board (video board) and looking at the "inverter" board. Unfortunately, when I removed the inverter board (it connects to the LCD CFL bulbs) one of the darn bulbs broke AND after talking to a coworker I really, really fried the LCD. I thought I looked very closely at the replacement boards, but not close enough. I was told the voltages were incorrect on the AV board. I didn't notice small jumpers and a small sticker that indicated 12v on the original board. I was told the power supply replacement had the wrong voltages too. No doubt a lesson learned. So, since the unit was totally fried, it was disassembled to maybe use a couple of parts from it and to look at the CCFLs. As pictured, the lamps are old and quite dark on the end, not worth saving, even though they do light up a little with the use of a neon tester. Another picture shows the "light diffuser," which kind of evenly disperses light from the bulbs to the front of the screen.



bulb socket

LCD bulbs removed from frame



LCD frame

light "defuser" from 40" LCD
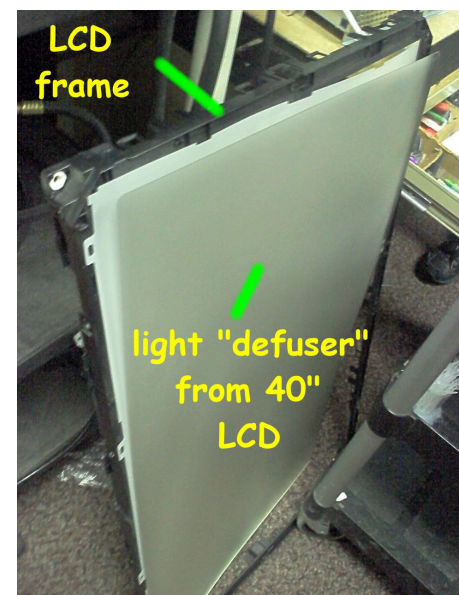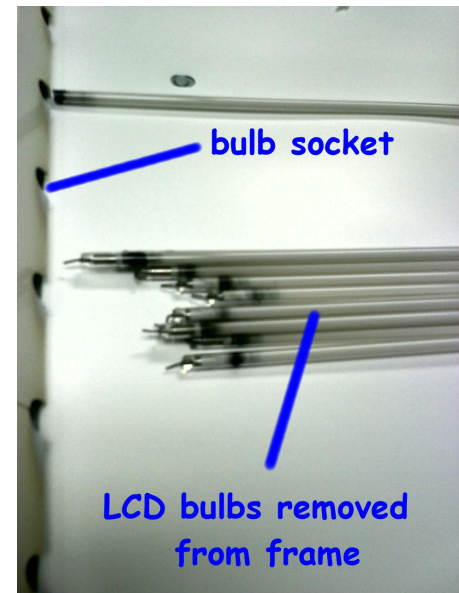
One picture shows the "antennae" end of the neon tester. When it is next to a piece of neon from a sign or next to a CCFL bulb from an LCD, it will light up. No, I would not even come close to touching the neon tester when power is on; it would hurt. Low current but high voltage. It was pretty cool helping take the LCD all apart to see all of the internal items.

-Pat Porath
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March 2013

# Slot Tech Event-Trinidad and Tobago

The Island nation of Trinidad and Tobago (yes, it's ONE country made of two islands) lies less than a dozen miles from Venezuela, in the steamy hotness of the Caribbean. But the heat and humidity didn't prevent 32 of us from cramming together in a training room for a couple of weeks in February for some serious training for casino powerhouse Ma Pau and sister operation "TTG." The first week of training covered power supply and monitor repair. The second week covered digital electronics. I wish I enjoyed spicy food. It was ubiquitous.



Above: Head Tech Ricardo Small works on a project



The "Power Supply/Monitor Class"



Above: Xavier Davis (center) missed the class picture.



The "Digital Electronics/Advanced Class"

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