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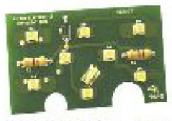

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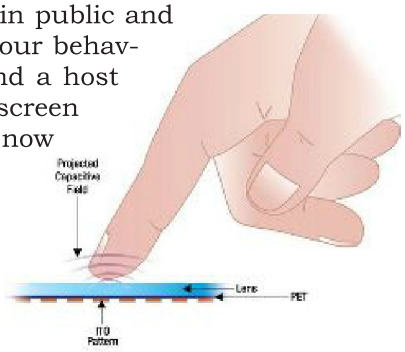
Inside Slot Tech Magazine

December 2009

Randy Fromm

Now you can pinch and flick in public and nobody will think badly of your behavior. In fact, pinching, flicking and a host of previously impossible touch screen behaviors are all possible right now with 3M Touch System's evolutionary new projected capacitance touch screen with fully functional, unrestricted, ten-finger touch. They showed it at G2E and while it is not enough for a feature article-It's ten-finger touch. What more can you really say about it?-it is well worth mentioning as a nice, new technology.



Of course, there are plenty of non-gaming applications that immediately come to mind once you lift the single-touch restriction. Full QWERTY keyboards now work with fingers resting on virtual keys. Piano keyboards do too. The types of virtual joysticks and other controllers that are now possible are "virtually" limitless in the true sense of the word. We shall see what the gaming industry's design engineers come up with using this new device as a human interface.

Scott Reynolds is back! Some of you may remember Scott from the early days of Slot Tech Magazine. Well, for the past half-dozen years, Scott has worked for a manufacturer whose employment practices prohibited him from moonlighting in the gaming industry (a sensible rule, I suppose). That extended to writing for Slot Tech Magazine. Unfortunately for Scott, he was laid off but we win because he has contributed a nice article on IGT machines. Thanks, Scott. Welcome back. BTW, he's still lookin' for work so if you have anything, e-mail sreynolds@slot-techs.com.

Randy Fromm

Randy Fromm - Publisher

Randy Fromm's
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Tips for the IGT "G" Series Machines

By Scott Reynolds

I'd like to share with you some information I have on the IGT G Series games, including the G20 upright, G20 Bar Top, G22 Slant Top, G23 Upright, S-AVP and the SMLD, in the hope that it may help.

Let us first discuss the various Ekeys and diagnostics. There are three Ekeys used on all AVP games:

Ekey 3 – Installation

Ekey 4 – Diagnostic, used among other things to clear safe RAM and cabinet memory (cabinet memory is equivalent to E2)

Ekey 5 – optioning

In order to figure out which diagnostic key to use when troubleshooting or loading software, you must know the "family" of the software installed on the machine. You can find this information in the PSR (Program Summary Report) for the software you are installing/troubleshooting.

The G20 & G22 are video slots while the S-AVP is a three, four or five physical reel slot and an SMLD is a Multi-Level Display in an S-AVP cabinet made to look like standard three, four or five reel slots. If you have trouble navigating the narrow touchscreen on the S-AVP, you can use a capacitive stylus designed for the iPhone/iPod Touch. These can be found at amazon.com or many other places on the internet. Just search for iPhone stylus.

The G23 is primarily used in participation games such as Star Wars, Wheel of Fortune and Indiana Jones Multi-Level Progressives so most casinos shouldn't have to worry too much about them. In the case that you have "device offline errors" as described later in this article, you can use the procedure as described with one exception: If the LED bar lights go out, power down the machine, unplug the USB cable for the light board (the light board will be located in the upper left of the main cabinet), Plug the USB cable into a new USB port and power up. The cable for the lights must be plugged in before the machine fully boots or the LED light bars will not come on.

The games you have will either be AVP 2.5 or 3.0. The 2.5 is the most common right now and has a separate video card. When you need to load software, you must use a write protect jumper on the pins located on the lower left corner of the brain box. The 3.0 on the other hand has integrated video and a write protect switch in the lower left corner of the brain box.

Be aware that all of the 2.5 games suffer from heat issues primarily caused by faulty video card fans. If you have

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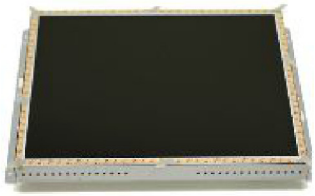

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any type of video issue and/or rebooting, check that the fan on the video card has not seized or is about to seize.

All of the G series games suffer from many types of RSOD (Red Screen of Death) memory errors, so named because when one occurs, the screen goes red with an error message. A good deal of these can be taken care of by clearing safe storage memory. If however, you encounter a "Presentation Manager" error, the 1GB DRAM stick will need to be replaced. To clear safe storage memory:
1. Power down the machine
2. Insert proper diagnostic flash drive in any available USB port
3. Insert Ekey 4 in protected USB port, this is usually behind a locked door on the brain box
4. Power up the machine
5. After a little while you should see a light blue screen come up with many different buttons on it
6. Select "Clear Safe RAM"
7. Follow instructions
8. When finished, remove diagnostic flash drive and Ekey 4
9. Cycle power
You will need to enable games and set percentages following this procedure; all other options should be fine but verify them just to be sure.

Other problems you may you may run into with all of these games are peripherals that error with "Device Offline" messages. The first thing you should try is this: unplug the USB cable of the offending peripheral, power down, power up and then plug peripheral into different USB port. Due to an issue with software, the USB ports tend to go to sleep after a time and this is the approved way of waking them back up.

If you encounter a game that is stealing bills, be sure that the bill validator has either the netplex connector or USB connector plugged in depending on your setup but not both; if both are plugged in this will cause a conflict which in turn will cause the stealing of bills.

If you get a "License Dongle Failure" following option changes, power outage/ brownout or player tracking problems, check to make sure that the time and date are set correctly. The license dongles are encoded with a date when they are loaded at IGT. When the real time clock on the machine defaults for any reason, it returns to 1986 or some other date in the past, this date is before the encoded date on the license dongle and therefore the software sees it as a failure.

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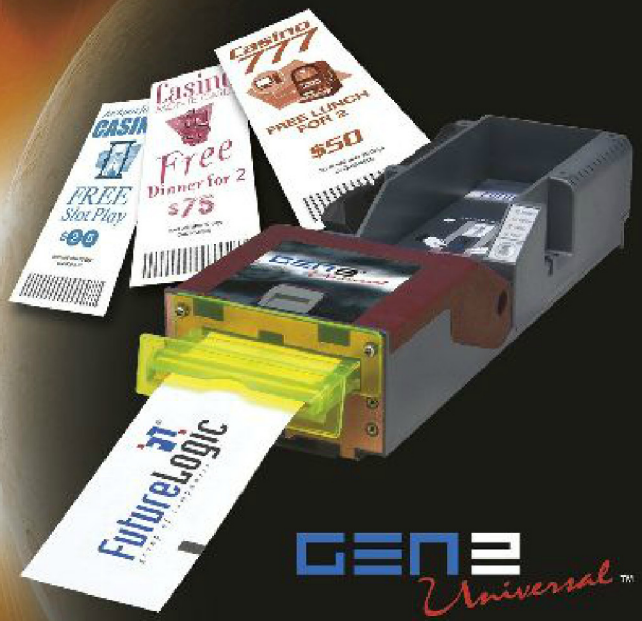

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The G22 slant top frequently has issues with main door open errors. Get out your Allen wrench and loosen both screws on the door latch, pull this latch assembly up with your fingers and tighten down the screws at the same time. The main door must be closed forcefully but not slammed; lower the door gently to the latch then put both hands over the center of the door and push down hard. The latch pin on the door itself is cast metal, so there is no bending it. A lot of things are cast metal on these machines so that individual parts cannot be replaced anymore.

The G20 upright latch pin (the pin you lift to release the latch so the door will open) frequently breaks off. This is typically due to the pin just being pressed into the plate. If one of these latches needs to be replaced, you will most likely need security involved as the bill validator and cashbox assembly must be removed to access it. The IGT Part number for new welded latch pin plate is 59682000.

On the S-AVP, there are several items to watch out for. When the S-AVP originally shipped, it was equipped with a ticket holder expander that screwed onto the top of the printer. As you know, most floor people are hard on equipment and they will typically slam the printer home when closing it on these games. There are two things that frequently happen when they do this: First, the spring that controls the latch which holds the printer up comes off and the printer will no longer stay upright. Second, the ticket holder expander is forced into the USB cables which are directly behind unit. This can break the wires in the USB cable or more likely, damage the USB port which is located on the distribution board attached to the back wall of the game. The distribution board generally has to be replaced at this point and that is a long and painful process as the brain box assembly, AC Power assembly and printer assembly must all be removed to access it. Do yourself a favor and remove the ticket expander. No one I have ever talked to actually uses it. As for the spring, you can either make your own or order a replacement. The IGT part number for the spring is 33011890W.

On the S-AVP, if you are getting various reel tilts that will not clear, take a look at the USB cable that runs from the reel driver board behind the reels down to the distribution board. The USB connector originally used on these was a standard straight connector. The problem is that it butts against a sound amplifier board which eventually creates a short in the cable and causes the tilts. You should replace this with a 90 degree connector or for the short term, you might be able to remedy it like this: Remove one of the nuts that hold the sound amplifier board in place and swivel the board up at an angle. Then, tighten the remaining nut to hold it in place so that it no longer interferes with the USB cable.

If you encounter a 3.3v out of range on an AVP 2.5, you can remove and reseat the cable from the ATX power supply to the brain box. Remember to turn the power off first. The ATX power supply is in a cage attached to the top of the brain box and has two cables that run from it to the distribution board in the back. AVP 2.5 and 3.0 ATX power supplies and cables are not interchangeable.

When trying to load software on an AVP 3.0, if you get a message that the machine cannot see the hard drive, clear the CMOS in the brain box. On the back of the main board in the brain box you will see a jumper marked CMOS. Remove and then replace this jumper to clear. Software should now load normally.

That's it for this time. If you have any comments or questions, please don't hesitate to write.

- Scott Reynolds
sreynolds@slot-techs.com

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Subject: TechFest 20
Date of Event: May 4-6, 2010
Location: Mystic Lake Casino Hotel

Schedule of Events

Events subject to change

Tuesday, May 4, 2010

9:00 am - 12:00pm

Power Supply Repair - Presented by Randy Fromm - Let's face it, we have a lot of pwer supply failures in slot machines. Some power supplies are more-or-less disposible due to their cheap replacement cost but many of the supplies we find in slot machines are custom-built units costing hundreds of dollars. For example, the ability to repair Aristocrat and IGT power supplies (actually manufactured by Setec and Win-Tact respectively) in-house will save your casino hundreds or even thousands of dollars in a year. We will cover the operation and repair of power supplies in detail during this session.

1:15pm - 3:15pm MEI - BV troubleshooting and repair - Suzo-Happ's Director of Training and Service David Oldham will discuss BV operation and service. Troubleshooting guides and handouts will be presented to help speed through troubleshooting in the shop.

3:30pm - 5:30pm FutureLogic Ticket Printers - Suzo-Happ's Director of Training and Service David Oldham will discuss FutureLogic printer operation and service.

Wednesday, May 5, 2010

9:00 am - 12:00pm CRT & LCD Monitor Repair - Presented by Randy Fromm - Video slot monitors are a lot easier to fix once you know how they work. Some understanding of electronic components will be helpful as this session will be somewhat more advanced than at previous TechFests.

1:15pm - 3:15pm 3M Touchsystems Touch Screens - Touchscreen Technology Presented by Paul Hatin and Mark Roberts - 3M Touch Systems Field Application Engineers - It is really amazing how touchscreens actually operate. During this session, touchscreen theory of operation will be presented along with diagnostic and repair techniques.

3:30pm - 5:30pm Incredible Technologies Slot Machines - Incredible Technologies has been credited by many operators as one of the most important and innovative manufacturers of video games in the world. Their "Golden Tee Golf" game revolutionized the online game tournament. Now, IT brings their team of manufacturing and design experts to the casino industry and to TechFest 20 with a close look at their IT slot machine. You will not want to miss this presentation.

Thursday, May 6, 2010

9:00 am - 12:00pm Ceronix CRT and LCD Monitor Repair - Presented by Troy Nofziger - Ceronix
Armed with a general knowledge of how monitors work (and how to fix them when they don't) it's time to look at Ceronix. The Ceronix design is unique in the entire world and requires a bit of specialized knowledge in order to be successful at repair. LCD Monitor repair will also be covered. Ceronix's most experienced bench tech, Troy Nofziger will instruct.

1:15pm - 3:15pm Transact Technologies Ticket Printers - Transact Technologies' Russ Wigé presents servicing and troubleshooting Transact brand, thermal ticket printers. These units are simple to understand and troubleshoot, once you know how they're put together.

3:30pm - 5:30pm JCM Bill Validators - This is arguably the best seminar of its kind in the gaming industry so we've saved the best for last. This presentation will be given by JCM's Jack Geller. This is your chance to ask the world's #1 expert about your JCM "issues."

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Touch Screen Troubles

By Vic Fortenbach

It's Friday night and it's busy in the casino. You're walking the floor, just waiting for a call, when you notice a guest struggling to pick her numbers on an IGT bar top keno game. You notice that no matter which number she touches, a different number is selected. You figure it's a simple touch screen calibration problem. You perform the calibration procedure and test it by drawing straight lines on the screen with your finger in a cries-cross pattern but in certain areas, the straight lines you drew are displayed all wavy and curvy. Maybe it's getting late and you're tired but you know you drew straight lines. So you try again. Your finger moves straight and the lines start out straight but then go wavy and straighten back up. No, you're not tired, the touch screen has scratches. Where there is a wavy line, a scratch is nearby. The more the wavy the line is, the longer the scratch is. Most of the time the casino guest does not know that they have just scratched the touch screen. Jewelry is the main cause. All a guest has to do is to graze the screen with any diamond jewelry while reaching for change or a drink and the touch screen is damaged. There is no way to repair a scratch in the touch screen, so replacement is in order. Touch screens or touch sensors as some manufacturers are calling them, are now made by several different companies, including Microtouch, made by 3m Touch Systems (www.3mtouchsystems.com), Touch international (www.touchinternational.com), Optera (www.optera.com) and Digitech www.digitechsys.co.kr. Optera is the only company currently making curved touch screens for CRT monitors; Touch international and 3m Touch Systems stopped making curved touch screens a few years ago. Optera touch screens are available from American Gaming and Electronics, AG&E (www.agegaming.com). There are several other manufacturers making touch screens and controllers but their use is very limited in the gaming industry.

Figuring out a touch screen problem can be tricky. Is the problem related to the glass touch screen itself or the controller? One sign that the touch screen controller may be bad shows up in the touch screen calibration test. You draw your criss-cross lines as usual but the lines on the screen start to curve, not a jerky wavy line but a gentle slow curve. Most of the time, this occurs in the lower corners. It is impossible to draw a calibration test line into this curved area. One reason this has happened is some liquid from a drink spill has seeped into the area under the monitor bezel and has started to corrode the fine printed circuit traces (lines) along the edge of the touch screen. Once this has happened, touch screen replacement is imminent, since there is no approved way of repairing this touch screen. Sometimes this problem can be linked to the touch screen controller itself.

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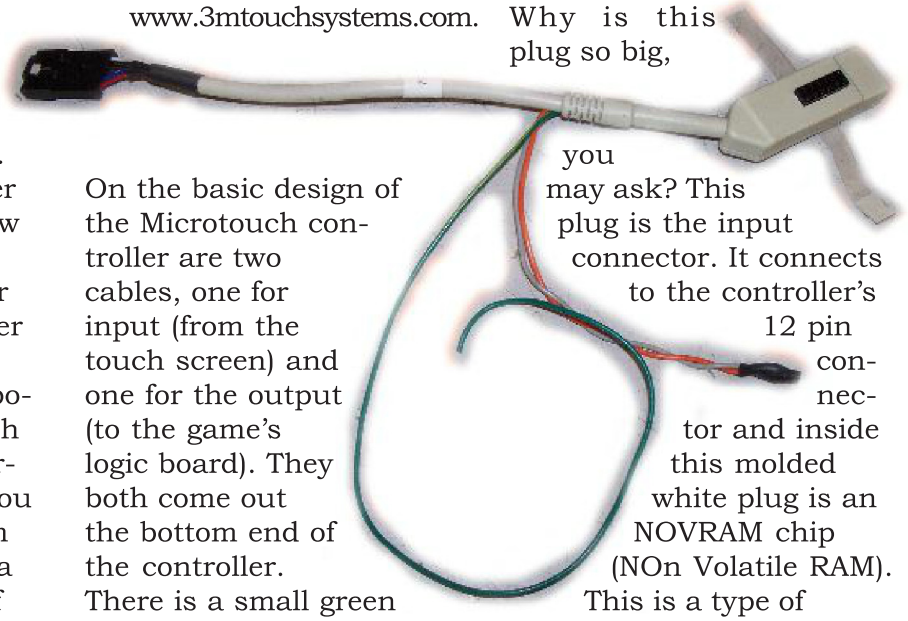
One obvious symptom of a touch screen controller failure is freezing. The screen is just frozen; no touch screen input will make the game proceed. Sometimes the controller will lock up and not allow any touch screen input from the touch screen or the player buttons. Power resetting the game only cures this problem temporary. Replacing the touch screen controller is in order. Many years ago if you had a controller problem you could not just grab a controller from the shelf and install it. This is due to the serial communication configuration. But times have changed and now the controller configuration step is not necessary. You can pretty much just plug and play a new controller into a game. Just be sure to pay attention to the input and output cables/connectors of the controller.

The most common controller is a small pearl-colored case about 3 x 4 inches in size (see figure 1). Microtouch was one of the first companies to manufacture touch screens and touch screen controllers for the video and gaming industry. They have been doing that since the early 80s. The Microtouch Company and name have since been merged with 3M which now owns, manufactures and markets controllers and touch screens with the Microtouch name. Their web site is www.3mtouchsystems.com.



On the basic design of the Microtouch controller are two cables, one for input (from the touch screen) and one for the output (to the game's logic board). They both come out the bottom end of the controller. There is a small green LED on the opposite end. This green LED is not only a power indicator but also a diagnostic tool of sorts. You can use the LED to confirm the controller is receiving a touch from the touch screen. The LED change brightness level when the touch screen has been touched.

If you remove the case from its mounting (which is usually mounted on the back side of the LCD monitor or inside the monitor frame on a CRT) you will see the input cable has a large molded white style plug on the end (see figure 2). Both 3M and Touch International used this same style of plug on their touch screens. Why is this plug so big, you may ask? This plug is the input connector. It connects to the controller's 12 pin connector and inside this molded white plug is an NOVRAM chip (NOn Volatile RAM). This is a type of memory chip that no power is required to retain its memory. Memory for what you may ask? The data for the linearization of the touch screen. The touch screen linearization data is stored in the molded white

The Touch Controller

plug, which should always remain attached to the sensor itself. All you have to do is mount it and connect it. You should calibrate and test a new touch screen and controller just to confirm its functionally.

The output cable is a serial communication from the controller to the game's logic board. The communication to and from the touch screen controller uses the RS232 serial standard. Normally the controller gets its power from the cable going to the logic board. The controller operates on a single +5 volt supply. Along the input of white touch screen cable are three additional wires protruding from the cable about one inch from the white NOVRAM plug. The wires just kind of hang there but are usually tie wrapped up. These orange, grey and green wires are available so 12 volts may be used to power the controller instead of 5 volts. The orange is the +12 volts, the grey is ground and the green is the Earth ground. Only one or the other power connections can be used (+5 or +12) never both. No matter which power configuration the game manufacturers chooses to use, the green wire MUST be connected to ground. The touch screen may be intermittent or not function at all if this green wire is not connected. Since the orange and grey wires are just tie wrapped up or hanging, it's a good habit to apply heat shrink tubing to the ends of these wires (separately) to prevent them from touching something or shorting out.

On the newer IGT AVP games (which are PC based) the controller is mounted inside and on the back of the lower monitor. The top monitor does not have a touch screen or controller. But instead of having a serial output, its output is USB. The serial and USB controllers can not be swapped between different machines nor can you just cut the plug end off and replace it with the other.

If your game is an older IGT video, don't search for the controller inside the monitor. Its not there. The older IGT games use a special communication protocol for the touch screen designed by IGT and named Netplex. No RS232 serial controller here. IGT uses this Netplex protocol to communicate with devices throughout the game including bill acceptors, printers and touch screens. The Netplex touch screen controller is not a nice little box but a large PCB mounted to the inside chassis of the monitor. This controller does have a red LED instead of the green one and it still functions the same. The large white molded plug still attaches to this PCB controller but because of its size and weight, the large white plug loosens up frequently. This causes the touch screen not to function. On some LCD monitors there is a bracket that will hold this white plug securely to the PCB. Because this controller is Netplex compatible, it uses 13 volts from the power supply for power. The orange and grey wires are still left unconnected.

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