Fun at TechFest 10!

Slot Tech Editorial

Wow, what a TechFest! TechFest 10 was held last month at the Excalibur Casino in fabulous Las Vegas, Nevada. This TechFest was notable for a number of reasons. Firstly, there was a record number of attendees at TechFest 10, 86 in all. This was largely due to the sponsorship of TechFest 10 by the Mandalay Resort Group who recognized the value of this technical training program and wanted to offer it the 50 top techs in their organization.

Represented at TechFest 10 were attendees from the Jicarilla Apache Gaming Regulatory Commission, Texas Discount Slots, Casino Rama, Spirit Mountain Casino, Lac Courte Oreilles, LA Slot Machine Co., Inc., Apache Nugget Corporation, Cannery Casino, Treasure Bay Casino Resort, Fiesta Henderson Casino & Hotel, Isle of Capri Casino, Hon-Dah Resort Casino, Colville Tribal Casinos, Bally Gaming & Systems, Union Plaza Hotel & Casino, Rampart Casino, Slots A Fun, Circus Circus Las Vegas, Gold Strike Jean, Nevada Landing, Edgewater Casino, Circus Circus Reno, Colorado Belle, Luxor Casino, Excalibur Casino, Detroit Motor City Casino, Mandalay Bay Resort, Blue Lake Casino, Chewelah Casino, Richman Casino, Chukchansi Gold Resort & Casino and Black Bear Casino.

Secondly, TechFest 10 was notable for the introduction to the slot techs of JCM's new Universal Bill Acceptor (UBA) with its plastic cashbox, USB connectivity and a host of other features.

Also introduced at TechFest 10 was an extreme demonstration of 3M Touch Systems new DST (Dispersive Signal Technology) touchscreen that proved without doubt that this new touch technology provides a perfect touch, regardless of scratches on the surface. On page 24 you will see a 3M Touch monitor being "vandalized" with a Mohs 9 hardness stylus (just under Diamond in hardness). The stylus was used to cut a horrible, serpentine scratch into the surface of the monitor. Regardless of the scratch, it was still possible to trace a perfect "X" onto the screen with a finger, crossing the scratch a dozen times without any skipping or displacement effects whatsoever.

As anyone who has been to a TechFest knows, we make full use of closed-circuit video cameras, remote monitors and CRT projectors in order to display components, sub-assemblies and schematic diagrams to everyone in the room. This year, I added a couple of really high-tech components to the mix. One is a robotic camera operator that allows me to control the "master" video camera. The other is a hard-drive based video recorder that allowed me to switch between the master camera and the close-up camera and to record the whole thing as I went along. The happy result is that I now have much of TechFest 10 recorded and will be able to offer "TechFest - Live!" on DVD just as soon as I am able to create a set of masters. This will enable those who attended the fast-paced, three days of technical training to review what they have learned and pick up on the things they missed. The DVDs will also be available to those properties that were unable to send their techs to TechFest.

This issue marks the introduction of a new series on digital monitors. With the assistance and cooperation of JCM American and Tovis, we will take a detailed look at what will arguably be the last hoorah of CRT-based displays, the digital monitor.

In this issue, you will find the schematic diagrams for two Tovis monitors, the MTG-1960 and the MTG-1702. For some techs, these schematics have been hard to come by and JCM (Tovis' distributor in the USA) has given Slot Tech Magazine permission to reprint them here. If you carefully open the staples, you can remove the centerfold without damage. We will be using these schematic diagrams to discuss the circuits in future issues so keep them handy.

There is more inside of course, so enjoy the first issue of 2005 and a happy New Year to all from Slot Tech Magazine.

See you at the casino.

Randy Fromm

Randy Fromm - Publisher

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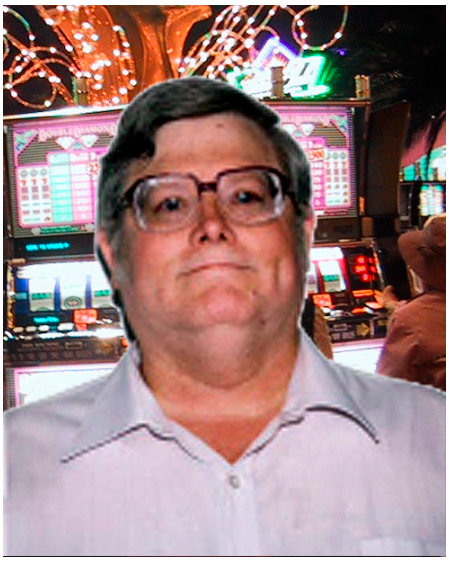

Bally EVO

Hybrid Reel Control Unit

AS-03356-0520 Reel Control Unit (RCU)

By Herschel Peeler

The Bally RCU communicates with the game MPU through the USB Port. U3 is the USB interface. The PDIUSBD12 is itself a microcontroller whose sole purpose is to handle communications between the USB port and the main MPU on the RCU (U7).

When receiving data from the USB port data is converted from serial to 8-bit parallel data inside the PDIUSBD12. When one byte has been converted the PDIUSBD12 sets the Interrupt line active. This tells the 80C32 that it has a byte ready. The 80C32 performs an Interrupt Routine that reads the data from the PDIUSBD12.

When transmitting data out the USB port the PDIUSBD12 sets the Interrupt request line active when it is ready to convert a byte of data. The 80C32 performs an Interrupt Routine that sends a byte of data to the PDIUSBD12. The PDIUSBD12 converts the byte to serial information and sends it out the USB port. When the PDIUSBD12 is ready for the next byte it sets the Interrupt Request active again.

I suspect that the information passed to the controller is just token information. In one byte of information we can specify one of four reels and up to 64 virtual stops on that reel. Perhaps a format like "rrss ssss" where the "rr" is a two-bit value that specifies the reel and the "ss ssss" specifies which reel position, up to 64. That's a guess, but that's the way I would do it. We would also need to tell how long to spin each reel. For a three-reel game we would need 6 bytes of information passed from the game to the RCU. The 80C32 starts the reels spinning, monitors the reel positions and stops each reel where and when it should be stopped.

The 74ALS646 chips are 8-bit ports that are set up to Latch information going from the A side to the B side, or read information from the B side to the A side unlatched. Not much more really need be said. The 74ALS646 is a pretty well known device. Most 74xxx devices should be familiar to you already so we won't spend much time on them.

The 80C32 controls operations on the board according to a list of instructions in the Program EPROM (27C010). The 80C32 has a set of operations it can perform that are stored in binary form in the Program EPROM. Upon Power On reset the 80C32 starts at Address 0x10000, fetches the contents of that address, executes it as an instruction and then goes to the next address, working its way up through Program Memory. That's a simplified story. Reality is somewhat different. Read the data sheet on the 880C32 for the more complete story.

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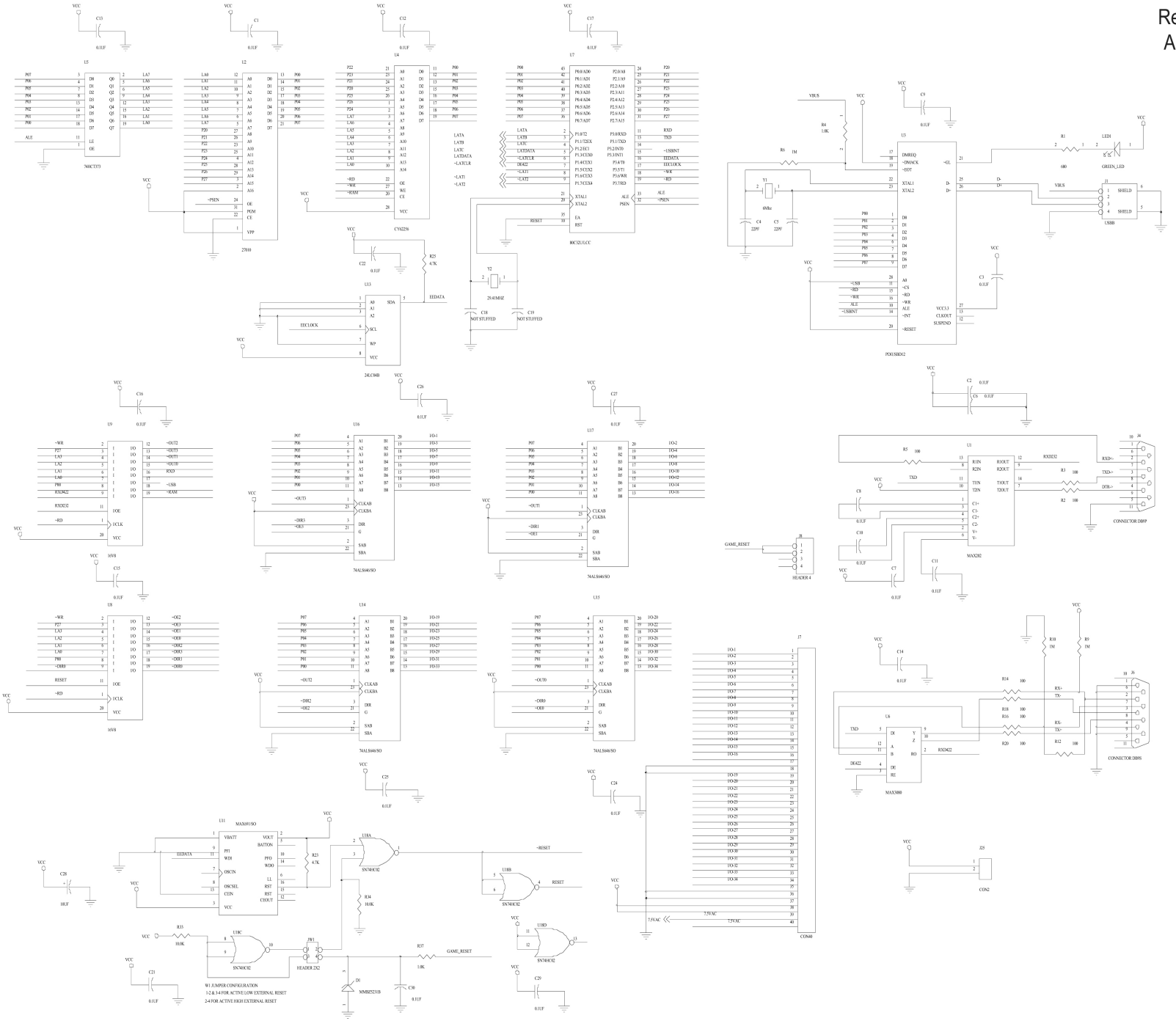

Reel Control Unit
AS-03356-0520
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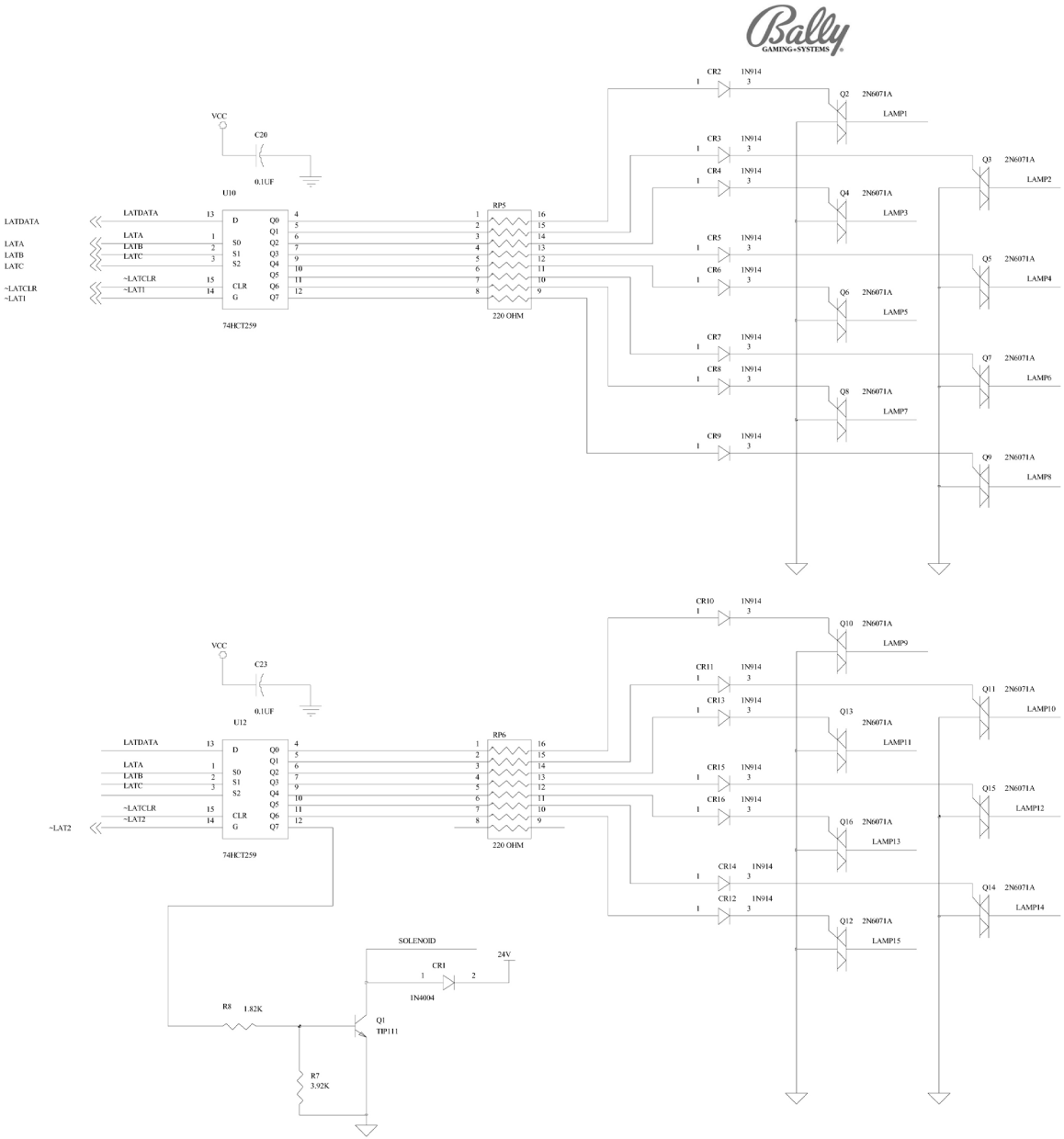
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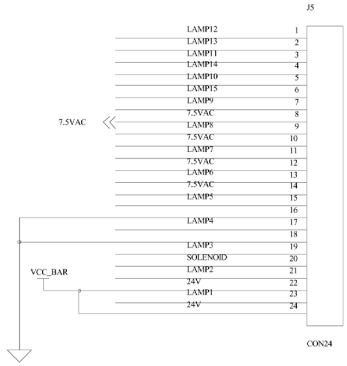
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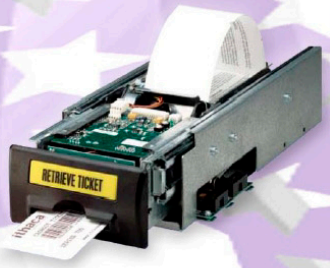

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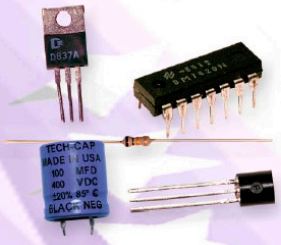

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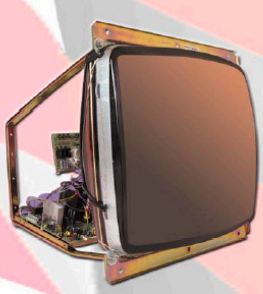

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In executing an instruction, the 80C32 may read data from some device into the 80C32, move data from the 80C32 to some other device or perform an operation on the information. Data may be temporarily stored in the RAM chip or may be stored for more secure storage in the EEPROM. To quote from the design specifications, "Critical Memory is to be maintained in at least three (3) logically and two (2) physically separate and distinct devices at all times."

The "three logically" devices are the CPU's registers, battery Backed up RAM and EEPROM. The "two physically" would be RAM and EEPROM. All Class II and Class III games are built this way. Before and after a game, these memories are checked to be in agreement with one another. If they do not compare, an error is generated stating a data mismatch, and a game will not be played.

Critical Memory is defined as all data important to the game: random number seeds, current credits, that sort of stuff.

Power Up Self-Test

When Power comes up, the MAX691 generates a Reset pulse to set the board to a known clear state. Otherwise things could come up in unpredictable conditions. We don't like unknown or unpredictable conditions, especially in slot machines. Reset also goes to the 80C32. When the 80C32 comes out of a Reset, it will run a self-test routine. This tests RAM for the ability to store and retain data, checks the EPROM for the proper checksum, checks the EEPROM for the ability to store and retain information and checks all other devices it can. If everything checks, okay it will spin the reels to the last known position. This checks the reel mechanisms and puts the game in the last known state. Referencing the EEPROM resets the Watchdog Timer in the MAX691, U11. We may also get a Reset from the game through U18C, a 74HC02.

All address decoding is done through U8 and U9, a 16V8 (a Programmable Logic device). These are logic arrays that may be configured as desired and programmed like an EPROM. These are not off-the-shelf items. What you could buy on the open market would be a blank device. They are then programmed just as you would an EPROM to set the configuration of the gates inside.

The 80C32 sets an address on its address lines. U8 and U9 decode this address and select the device to be talked to by activating one of the U8 or U9 outputs. U8 is used to reference U14, U15, U16 and U17, which feed the Reel Mechanisms. We can control up to four reels. U9 is used to control all other addressable memory and I/O devices. Each device has a unique address or range of addresses. There are a few exceptions to this addressing scheme. Some devices are referenced directly by the 80C32 without requiring an address. The EEPROM, a 24LC04B (U13) is referenced directly by two lines from the 80C32. It is deliberately referenced using as few system resources as possible for security's sake.

The EPROM (27C010) is large enough to take up the whole 64K address space and is also selected by a special strobe line, "~PSEN", program Strobe Enable. Other I/O devices are referenced as though they were memory devices.

U1, MAX202, is an RS-232 transceiver. U6, MAX3080, is an RS422 transceiver. These functions are found on many other boards and should be nothing new to you.

Overall, operation is pretty straightforward. When a game is started, the game MPU generates the random numbers and tells the Reel Control Unit where to move the reels. The RCU moves the reels to those positions and reports back to the MPU that the action was properly completed or reports an error.

I suspect that when the game does a self-test, the RCU does also and reports its condition to the MPU. This happens when the game powers up, the door is closed or the game comes out of auditing mode.

Herschel Peeler
hpeeler@slot-tech.com

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Transact Technologies Receives Patent

New patent significantly broadens company's two-color transaction printer patent portfolio

TransAct Technologies, a leading producer of transaction printers for customers worldwide under the Ithaca® brand name, has announced that it has received a notice of allowance from the U.S. Patent and Trademark Office that provides additional claims and significantly broader coverage for the Company's two color printing technology. The company's prior patents for this technology include U.S. patent 6,523,937 issued in February 2003 and U.S. patent 6,206,504 issued in March 2001. The technologies covered by the newly allowed patent application and the existing patents pertain to various types of printers, including inkjet and thermal.

Included in the newly allowed patent application are claims that cover a printer that prints an image containing a primary color and an alternate color, where a processor responds to print data to control a printer using a total of two print cartridges. Other allowed claims concern the printing of the primary and alternate colors in opposite directions as the print carriage traverses the paper.

Scott Carter, Vice President and Business Manager, Worldwide POS, said, "We have clearly developed very powerful and valuable printing technologies on which customers worldwide rely. The allowance of these additional claims by the U.S. Patent and Trademark Office will keep as at the forefront of providing the leading edge technology that our customers require."

New Digs in Las Vegas

TransAct Technologies Incorporated has announced that it has signed a five-year lease for a 13,700 square foot facility located at the Hughes Airport Center in Las Vegas, Nevada. The new facility will serve as TransAct's Global Gaming and Lottery Headquarters. The facility will also serve as the Company's new Western Region service center, will house the Company's West Coast POS and Banking sales unit, and will provide service to TransAct's growing base of installed printers in the region.

"Given the significant growth of our casino and lottery business in the key gaming markets of Nevada and California and the overall market penetration we have achieved in all of our core markets on the West Coast, it made sense to secure a larger facility in a location easily accessible to our customers and partners," said Jon Berkley, Senior Vice President and Business Manager of Global Gaming and Lottery. "The new facility is centrally located in Las Vegas, the heart of the gaming world, and offers optimal access to our entire West Coast client base."

"The services portion of TransAct's business has become a significant focus, as the number of installed printers continues to grow, it has become vital to establish a local service center in the region," continued Berkley. "The new service facility will allow us to better serve our customers by providing more efficient service and repairs. This service center will allow us to grow not only our gaming and lottery repair sales, but will also provide us with the capacity to service our POS and Banking customers in the western part of the US."

Above: Jon Berkley, Senior Vice President and Business Manager of Global Gaming and Lottery for Transact Technologies.

FutureLogic Announces South America Distribution Agreement with Suzo

FutureLogic Announces South America Distribution Agreement with Suzo International BV

FutureLogic, Inc. has announced a distribution agreement for South America with Suzo International BV, a worldwide distributor of components and systems for the gaming, casino and vending industries. Under this agreement, Suzo will sell and provide service for FutureLogic's thermal printers for cashless transactions throughout South America.

"Suzo has extensive expertise in the distribution of cashless transaction equipment throughout Latin America, and maintains a technical service facility in Argentina," commented Nick Micalizzi, Director of Gaming for FutureLogic. "This relationship gives FutureLogic the opportunity to provide comprehensive sales and service to this high growth market. The on-the-ground presence of Suzo professionals in the region allows us to enter these niche markets in a cost effective manner."

Patrick Suverein, Group Director of Suzo International concurs. "The addition of FutureLogic thermal printers to our product line-up enhances Suzo's offering of gaming, vending, and money processing equipment," said Suverein. "We are honored to become FutureLogic's exclusive distributor in South America and look forward to expanding their product reach and elevating the level of cashless solutions we provide to our customers."

About FutureLogic

Founded in 1983 and headquartered in Glendale, California, FutureLogic designs and manufactures high-reliability electromechanical assembly solutions for nearly every engineering need. As the undisputed leader in super-robust thermal printer technology, FutureLogic is the industry's premier supplier of thermal printers for casino gaming, promotional equipment, kiosk, industrial, parking, gas pumps and medical applications. In July 2004, the company founded FutureLogic Europe Ltd to provide direct sales and engineering support for the growing OEM thermal printer markets in Europe. For more information visit the company web site at: www.futurelogic-inc.com.

About Suzo International BV

Founded in Rotterdam in 1955, Suzo International supplies systems and components for the amusement, gaming, casino, and vending industries, as well as money processing machines and banknote readers. In addition to the distribution of brand-name products, Suzo develops and manufactures components, electronics, software and systems under the proprietary STC label. Headquartered in the Netherlands, with operations in Belgium, Germany, the United Kingdom, Argentina and Brazil, Suzo serves customers in more than 60 countries and has achieved a reputation for providing exceptional customer service. For more information visit the company web site at: www.suzo.com.

Unicum introduces Systems in Progress at ICE 2005

The innovative online management solution, Systems in Progress developed by Unicum Group of Companies, will make its debut at the ICE 2005 tradeshow in London.

Systems in Progress is designed as an effective online management and monitoring instrument for slot halls. It provides complete control over gaming machine statistics with reliable accounting data. The system practices real-time administration over the gaming process: tracks routine events, discovers errors, reports on malfunctions, provides remote machine lock/unlock, carries out payouts, etc. It smartly manages every significant gaming event, from automatic ticket printing to creating a full package of revenue, count, hand pay, doors opened, cash-boxes removed and other consolidated reports.

Systems in Progress also serves as an advanced promotion and customization solution which configures and triggers various jackpots with 17 progressive and mystery jackpot types set, customized and administered by the system. A valuable research device, SiP, allows building up marketing tactics with the optimum placement and range of gaming machines, games and credits for a gaming site based on the comprehensive gaming machines statistics.

The main advantage of the new Unicum product is its usability. Systems in Progress does not require any training on the operator's side and can be easily administered with the help of the User Manual. This simplicity does not influence the range of functionality accumulated in SiP.

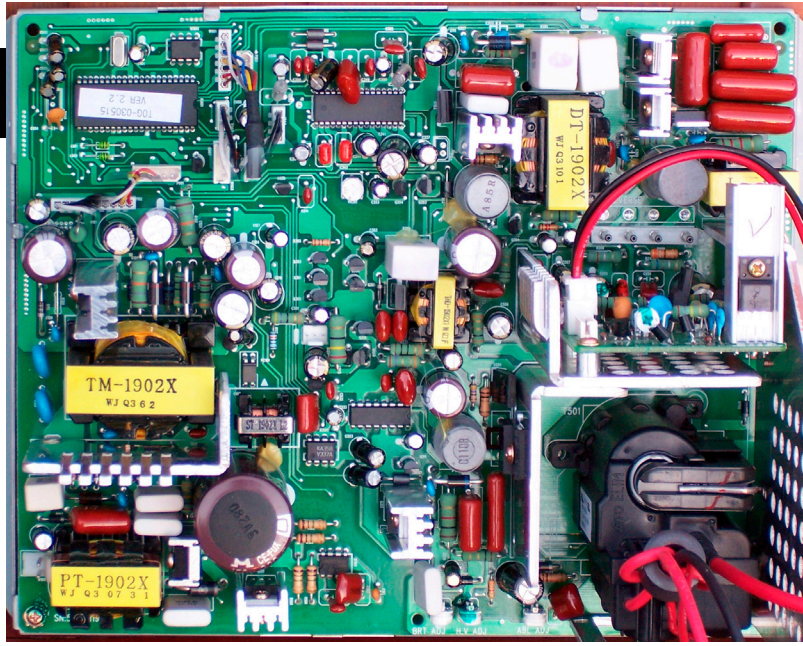
"While working on the SiP project, we tried to integrate all requirements that operators make to modern management and administration systems, such as simple implementation and usability, mobile access to data and its safe storage and advanced functionalities," said Helmut Steffenini, the General Manager of System-In-Progress Gmbh, a subsidiary of Unicum Group of Companies. "At the same time we wanted to make Systems in Progress an affordable solution. Judging by feedback from our customers, we managed to accomplish these tasks."

The international premier of Systems in Progress will take place at the ICE 2005 tradeshow in London. Unicum specialists will give a number of presentations on the product features and welcome everybody to visit the company at stand #3514.

Anastassia Kojemiakina PR Manager Unicum Group of Companies tel. +7 (095) 933-7770/1 cell. +7 (903) 225-2474 fax. +7 (095) 247-9852

TOVIS

An Introduction to Digital Monitors

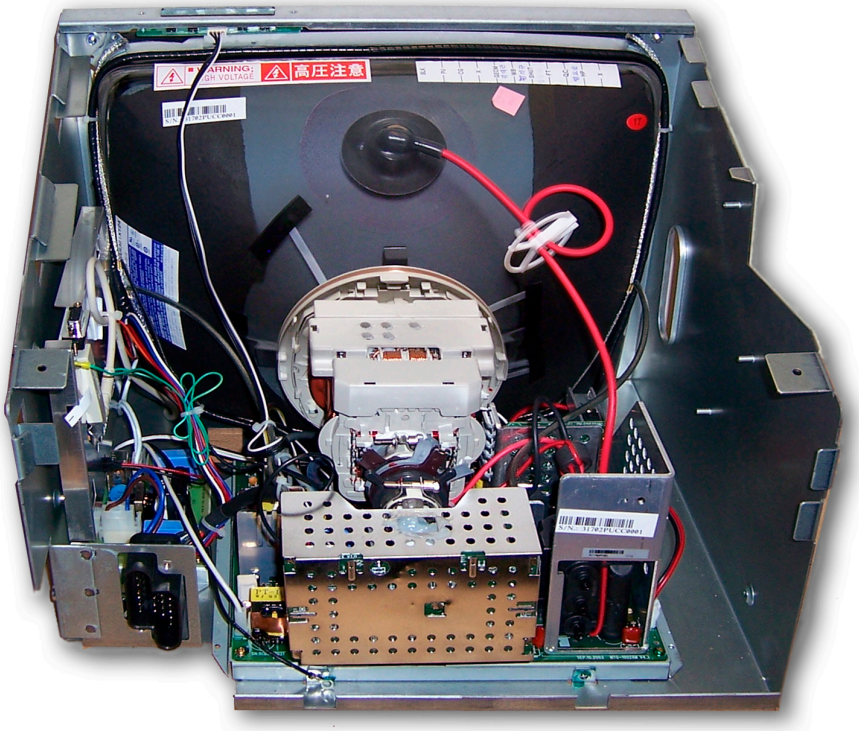


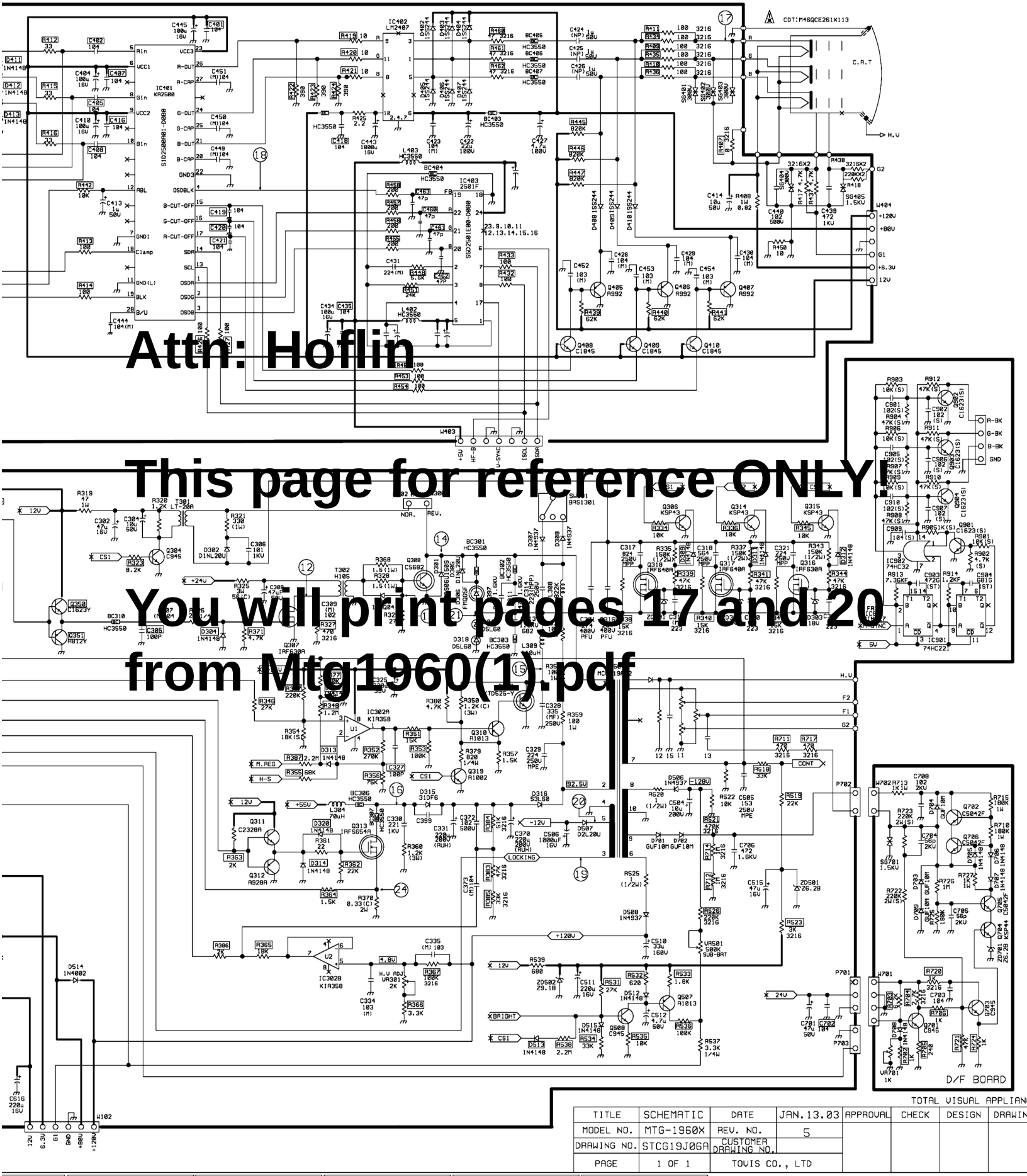
The term "digital monitor" means something completely different now than it did 20 years ago. At one time, a digital monitor was a sort of primitive monitor. Unlike an analog monitor, with the ability to reproduce more or less unlimited shades of gray or color, a digital monitor had video inputs that were TTL level inputs only. You could turn a color completely on or completely off but there were no "shades" of red green or blue. If you wanted to display something on the screen, it was black, red, green, blue, cyan, magenta, yellow or white. That was it. But then again, at the time these digital monitors were in use, all you were looking at on the screen was text. ASCII text. Nothing more.

Fast forward to the present and "digital monitor" means something completely different. It now refers to the use of digital devices and a digital control bus to control things such as multiple resolutions, the geometry of the raster and yes, even the video. In this case however, the video itself is analog but we are using digital signals to control the analog video levels.

Digital monitors allow us to have things like on-screen displays. They also allow us to manipulate and adjust various settings that previously required a multitude of potentiometers. Things like vertical and horizontal size and position, brightness, contrast and pincushion adjustments can all be made with just a few small pushbuttons on a remote adjustments PCB, eliminating a bank of fragile potentiometers and the ribbon cable that connected them to the deflection PCB.

Digital monitors use most of the same circuits with which





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MODEL NO.	MTG-1960X	REV. NO.	5				
DRAWING NO.	STCG19J06A	CUSTOMER DRAWING NO.					
PAGE	1 OF 1	TOVIS CO., LTD					

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LOCATION	DNF FBT	PARTSNIC(FFA71019U)	ELIM(MCH-19A22)
R348	750K	1M	1.2M
R378	75K	82K	47K
R387	2.2M	2.2M	2.2M
Q320	C-E SHORT	C-E SHORT	C-E SHORT

Frequence	CS0	CS1	CS2
68Khz	H	H	H
64Khz	H	H	H
60Khz	H	H	L
53Khz	H	H	L
48Khz	H	L	H
46Khz	H	L	H
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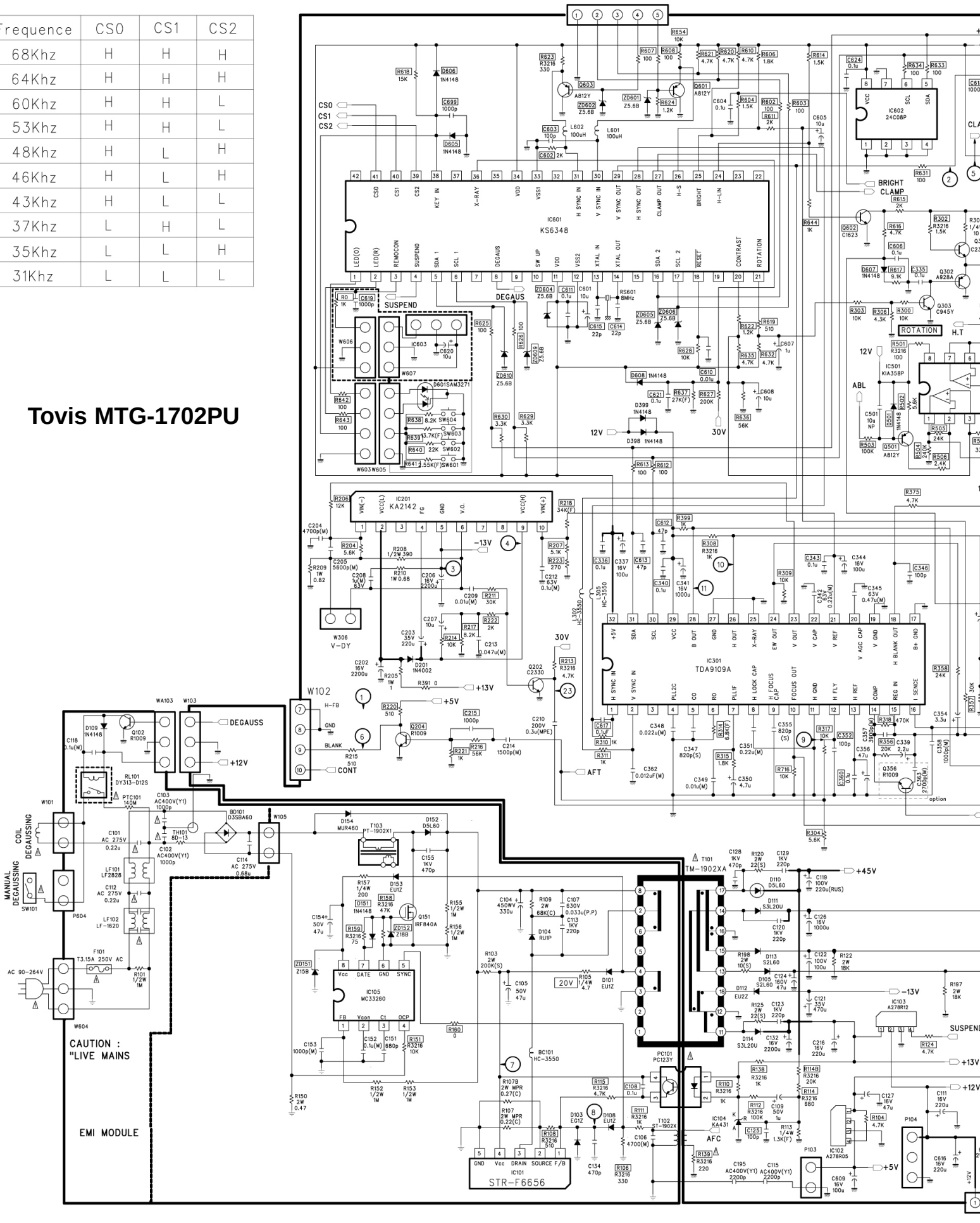
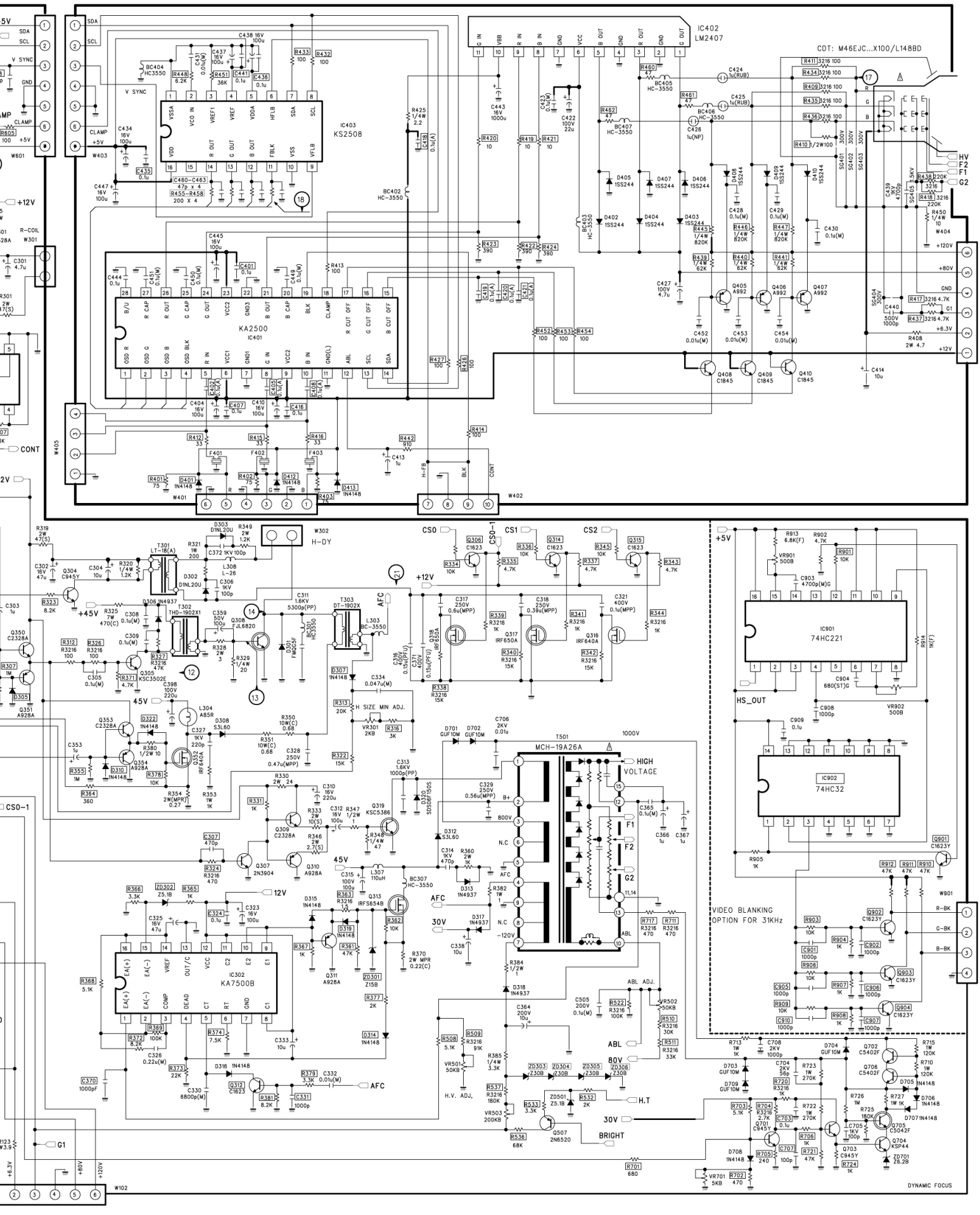
Tovis MTG-1702PU

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+80V
GND
+6.3V
+12V
+45V
+30V
-120V
+5V
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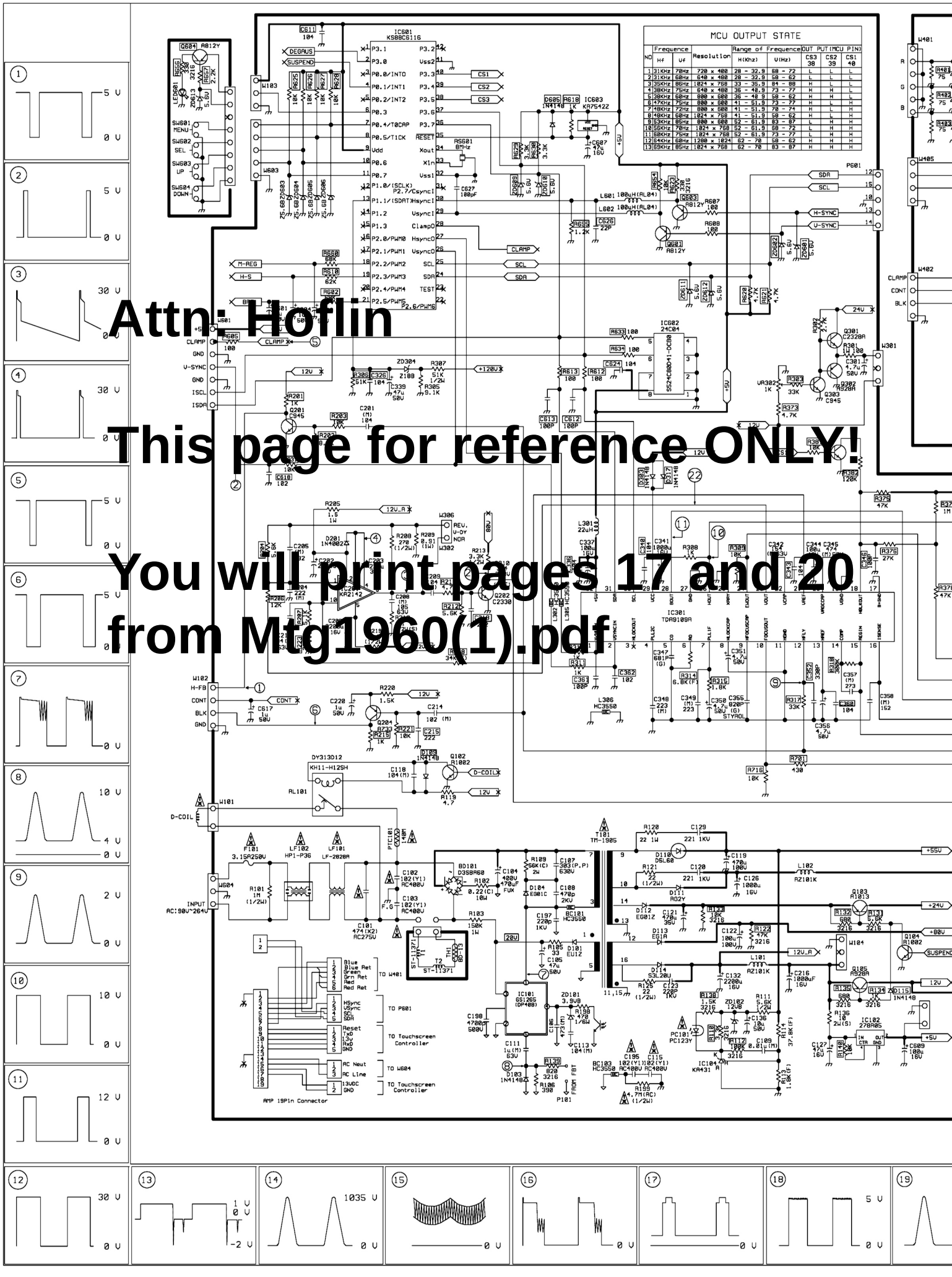
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What will you learn?

- CRT vs. LCD
- RGB Interface
- DVI Theory – DVI Interface
- Performance Testing
- LCD User Adjustments
- Color Theory
- Precision Color Balance Adjustment
- System Block Diagram Overview
- Power Supply
- Backlight CCFL
- DC to AC Converter
- Digital Signal Processing
- LCD Display Module

Who Should Attend?

- Mangers
- Servicers
- Slot Technicians
- Government Technicians
- A/V Repair Shops

What Do You Get?

- Hands-On Troubleshooting Experience
- Workbook Procedures
- Certificate of Achievement

dates & locations

2005 DATES & LOCATIONS

Take the Course!

Location	Date
Las Vegas, NV	Jan. 17-19
Las Vegas, NV	March 14-16
Atlantic City, NJ	May 9-11
Reno, NV	July 11-13
Las Vegas, NV	Sept. 12-14

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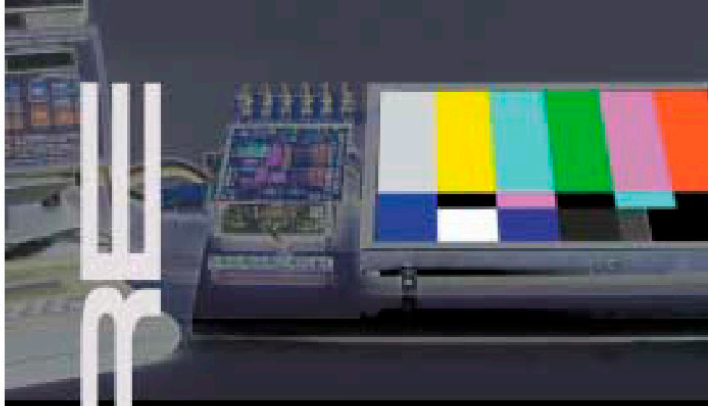


SENCORE

3-Day Hands-On

LCD Troubleshooting

and Calibration

Tech School

SENCORE

3-Day Hands-On LCD Troubleshooting and Calibration Tech School

With a class limit of 20 students, instructor to student ratio provides a great deal of hands on experience.

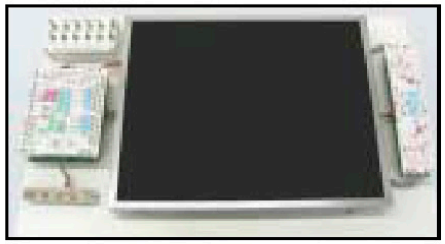
Today's LCD panels have greatly improved (and continue to improve) and are beginning to rival CRT's in most performance areas. In terms of size, weight, and power consumption LCD displays are far superior to their old CRT counterparts.

This comprehensive hands-on program covers troubleshooting and calibration concepts and techniques for LCD display types.

The course you have asked for!

What Will You Learn in this 3 Day Tech School?

- *Understand and apply safe servicing techniques*
- *Use test equipment to performance test and troubleshoot LCD monitors (SC3100, PSL60, VP401, LC103, CP5000U)*
- *Understand how to thoroughly performance test an LCD computer monitor*
- *Be familiar with switch mode power supply (SMPS) and LCD Inverter power supply operation and troubleshooting*
- *Relate SMPS and Inverter power supply block diagram test points to the equivalent schematic test point*
- *Understand multi-mode formats and circuit operation*



- *Understand analog (RGB) and digital signal formats and connectors (DVI)*
- *Explain the advantages and limitations of CRT vs. LCD displays*
- *Understand the theory and operation of fixed pixel displays, including LCD panel operation, signal processing, and backlighting*
- *Perform an LCD backlight replacement*
- *Perform LCD video calibration , including chromaticity (color temperature), black level, white level and geometry*

Course Description:

DAY 1

Equipment Familiarization/LCD Displays

The course begins with equipment familiarization and an overview of LCD displays. Students will discover how LCD panels work by learning the major functional blocks of an LCD monitor. Sencore has developed specific LCD trainers for hands –on demonstrations and troubleshooting exercises.

DAY 2

Hands-On LCD Monitor Troubleshooting

The second day of this course provides an introduction to troubleshooting LCD monitors. Entry level technicians and seasoned veterans will learn troubleshooting techniques and short cuts by using block diagrams and hands – on lab exercises.

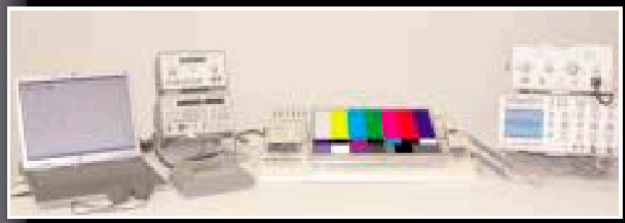
DAY 3

LCD Inverter power supply and SMPS Troubleshooting

The last day of the course provides an introduction to power supplies and their uses. The students then learn how each type of SMPS and inverter power supply works by performing experiments on a working model. This course is truly a hands-on course with approximately 70% devoted to lab time performing tests utilizing an exclusive Sencore power supply trainer.

Students will also be presented with Certificates of Completion following the Tech School.

This course is eligible for Continuing Education Credits (CEU).



we are already familiar. There is a switched-mode power supply, a video amplifier circuit, a sync circuit, a vertical deflection circuit, a horizontal deflection circuit and the high voltage circuit. It is in the horizontal/high voltage arena that we find a notable difference from conventional monitors in that the high voltage now has a somewhat independent drive circuit and no longer depends on the horizontal output transistor to drive the primary of the flyback transformer.

If all of that is Greek to you, just relax because starting this month and in the months following, we'll be taking a look at today's digital monitors, courtesy of our friends at JCM American who have generously donated a Tovis digital monitor to the Slot Tech Magazine laboratory for study and, just as importantly, have provided complete schematic diagrams and documentation. The centerfold of this month's issue is printed, double-sided with the schematic diagrams for two different Tovis monitors, the MTG-1960 and the MTG-1702. If you carefully pry open the staples, you will be able to remove the schematic without damage and make some copies for the shop. We will be referring to these schematics in the months ahead so hang on to them.

In the months ahead we'll look at digital monitors and how they operate. We'll look at the similarities between digital and analog monitors and see some pretty interesting differences as well. Along the way, we'll look at a host of new devices and get a better feel for using FETs as switches for signals as well as power.

Stay tuned.

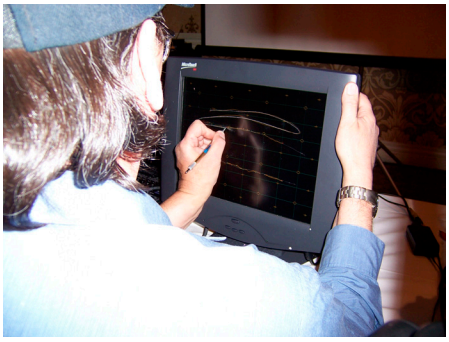
- Slot Tech Magazine

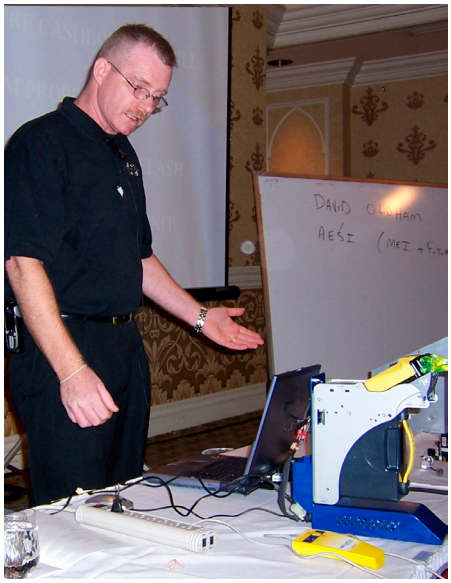
Slot Tech Event - TechFest 10 Excalibur Casino

Mark Roberts (l) and Ken Miller, from 3M Touch Systems systems, Inc., presented a look at a new touch screen technology under development. Everyone attending their session received a valuable package of technical information and a free, slot tech T shirt.

The company also presented an "extreme" demonstration of their DST (Dispersive Signal Technology) touchscreen that showed that this new touch technology (slated for market introduction in late 2005) provides a consistant touch, regardless of scratches on the surface.

Below you see a 3M Touch monitor being "vandalized" by Thomas Kesterson of the Fiesta Henderson Casino & Hotel. Tom is using a Mohs 9 hardness stylus (just under Diamond in hardness) to cut a deep, serpentine scratch into the surface of the monitor. In the bottom panel you see that he has been able to trace a perfect "X" onto the screen with his finger, crossing the scratch a dozen times without any skipping or displacement effects whatsoever.





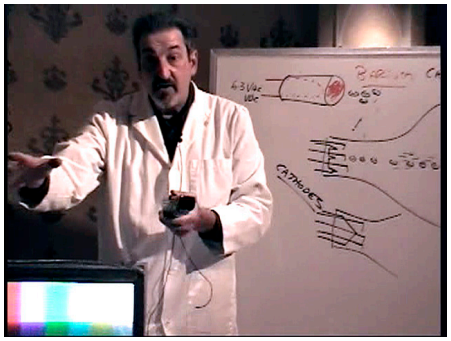
David Oldham of Advanced Electronic Systems, Inc. addressed the group as the first guest presenter at TechFest 10, held at the Excalibur Casino and Hotel in Las Vegas, Nevada. David presented a technical look at MEI's Cashflow SC66 bill validator and the FutureLogic printer.

Money Controls' Cesar Neira provided a detailed look at the Condor coin validator and their Paytrack coin hopper. This was Cesar's first time presenting at TechFest. A bit nervous at first, he eventually found his groove and went on to give a nice presentation. Thanks, Cesar. Good job.

Kanau Sugai and Robert Angell from Asahi Seiko showed their new AS3 coin validator product and their new EH-750 Multi-Coin Hopper.

Ron Parido from WMS presented technical information on their new Bluebird system. If you ever have a chance to train with Ron, take advantage of the opportunity. His presentation is dynamic and fast-paced in addition to being very complete and well-organized.

TechFest 10 anchor presentation belonged to Jack Geller of JCM. As usual, this dynamic presentation discussed cleaning and calibration procedures for WBA bill validators as well as repair issues. TechFest 10 also marked the introduction of JCM's new UBA (Universal Bill Validator) to most of the technicians attending the event.



The core seminar of TechFest is monitor repair, presented each morning by Slot Tech Magazine publisher Randy Fromm.

Slot Tech Magazine's resident slot math guru, John Wilson led the class through the construction of a simulated slot machine, complete with PAR sheets and a payoff for "Three Wild Randys."

Sencore was represented at TechFest by Kristel's Ray Holdren. Ray is a well-known, no-nonsense monitor tech that works out of Las Vegas. A big fan of Sencore gear ("I love it," he says) he gave a straight talk on what the equipment can do. Sencore also awarded two digital multimeters (Ray is holding one of them) as door prizes.

Coin Mechanisms' Mike Harris discussed calibration and programming of their stable of Coin Mech products.

Transact Technologies' Denny Salmela demonstrated the operating components of their Ithaca brand thermal printers.

James Halsey of IDX discussed their coin validator products. Here Mr. Halsey points out some of the data collected and stored by the product during programming.

Tommy Talbot of AstroSystems, Inc. discussed the new MicroCoin unit. He discussed the operation of the unit and calibration (none required) as well as programming.

A record number of slot techs (86) from 33 different properties attended TechFest 10. Attending were Cheryl Tafoya, Derek Johnson, David Hahn, Robert Elliott, Lela White, Brian Varley, Andrew Smith, Tom Snider, Tony Ciera, Alonzo Munoz, Marcena Chavez, Dana Shorty, Scott Swords, Frank Kappler, Thomas Kesterson, Bruce Chilson, Troy Hall, Lonnie Thompson, Randall Charley, Carlson John, Derroll Joe, Rick Long, Ernest Brooks, Larry Foutz, Hernan Alquisada, Johnny Vargas, Mariano Masicampo, Dan Morgan, Jeff Payne, Earl Pelletier, Greg Morgan, Dan Arterburn, Pat Vaughn, Mike Cahall, Tim Hamewka, Steve Hopper, Thom Wingert, Robert McClure, Raul Carmona, Christopher Mulloy, Billy Koetter, Dan Montgomery, Doug Heyman, Richard Hogsten, Bruce Rye, Tommy Giambalvo, Davey Tidball, Bill Hicks, Carl Fisher, Sid Ash, Mike Shamoon, Jack Paul, Bill Heald, Long Nguyen, Gerard Lingad, Wade Koenig, Ken Wealand, Bill Kitchener, K, n Twasta, Todd Tatum, Willie Gillespie, Vince Rodriguez, Arnold Wolfert, Tom Marsala, Ray Jurad, Harley Mougeot, Mike Morley, Armon Rachels, Mike Sollish, Steve Fishburn, Gian Pascual, James Snider, Link Meade, Mike Darlow, Tom Simmons, Duke Rowe, Jim Casey, James Jackson, Matt Brittain, Penny Braning, Sam Simpson, Beau Spoo, Nancy Seppala, Don Schablitsky, John DeVoll and Ryan McKeon

Packed in ICE

Thousands of casino professionals across the globe are preparing to make the journey to London later this month as the 2005 International Casino Exhibition (ICE) opens its doors at the Earls Court Exhibition Centre on 25-27 January. What awaits them is another record-breaking event boasting no fewer than 169 exhibitors from 32 countries offering every conceivable product, device or service designed to maximise business opportunities throughout 2005 and beyond. Whether it's for traditional land-based or offshore casinos and gaming parlours or state-of-the-art remote gambling systems, ICE 2005, together with its new interactive gaming section ICEi will feature all the latest developments.

Geographical spread of suppliers

Of the 169 companies exhibiting across 10,000sqm. (107,600sq.ft.) of net floor space at ICE 2005, 110 (65%) are based outside the UK with the USA (15 exhibitors) the most heavily represented overseas nation followed by the Netherlands with 10, Spain with nine, Slovenia eight and Russia seven. Australia and Sweden each provide six exhibitors with five each from Austria and Germany, four from each of Belgium, Canada and France, three from Italy and two from each of Argentina, the Irish Republic, Japan, Latvia and Taiwan. The remaining exhibitors are drawn from Brazil, Bulgaria, Czech Republic, Finland, Hungary, Israel, Malta, Norway, Panama, Portugal, Serbia & Montenegro, Slovakia and South Africa.

Strong Turnout Anticipated

Recent trends in visitor attendance would suggest that ICE 2005 is set to continue on its upwards path, superseding the all-time high of 7,322 casino professionals from 101 countries recorded in 2004. Last year's record attendance, including crossover visitors from the co-located ATEI [soft gaming and amusements expo], of 17,775 is also on course to be broken once again.

Debut Appearances

No fewer than 31 companies drawn from 17 different countries are making their very first appearance at ICE in 2005, representing almost one-fifth (18.3%) of the total number of exhibitors on the show floor. Nine of the debutants are UK-based with three each coming from Canada and the USA and two from each of Argentina and Sweden. There are also first-time exhibitors from Australia, Austria, Belgium, France, Finland, Germany, Latvia, Norway, Russia, Serbia & Montenegro, Spain and Taiwan.

High Profile Media Presence

This year's ICE will have the biggest on-the-floor presence of b2b gaming and gambling periodicals in the show's history with no fewer than 25 publications from 9 countries setting out their stalls on the show floor. Over 50 casino industry writers are anticipated at Earls Court and the show's organisers are once again inviting exhibitors to put themselves forward for the 'best press pack' award.

ICE takes place at Earls Court 2, London, UK on 25-27 January 2005. For more information, including FREE entry badge registration, the latest show news, exhibitor lists and floor plans and details of discounted hotel accommodation and travel info, visit www.ateonline.co.uk/ice

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GTECH Enters Into Partnership Agreement to Acquire 50 Percent Controlling Equity Stake of Atronic from Gauselmann Group

e-motion

GTECH Holdings Corporation (NYSE: GTK) and the owners of privately-held Gauselmann Group have announced that both parties have entered into an agreement whereby GTECH will acquire a 50 percent controlling equity position in the Atronic group of companies owned by Gauselmann. The remaining 50 percent of Atronic will be retained by the owners of the Gauselmann Group. The final purchase price will be calculated through a performance-based formula equal to eight times Atronic's EBITDA (earnings before interest, tax, depreciation, and amortization) for its fiscal year 2006 ending December 31, 2006. In addition, in the 12 months after the closing, Atronic will also have the potential to receive an earn-out based on its 2007 performance above specified thresholds. Based on Atronic's medium-term outlook, GTECH expects the all-cash transaction will have a total value of approximately $100 million to $150 million, for its 50 percent share including the assumption of debt.

"The alliance of GTECH and the Gauselmann Group represents the coming together of two industry leaders that share a common vision of the future of machine gaming. GTECH and Gauselmann are creating in Atronic a new strong global competitor in gaming content, equipment, systems and services, and a market innovator with strong positions in the highest growth gaming markets," said Gauselmann's Co-Chairman and CEO Michael Gauselmann and GTECH President and CEO W. Bruce Turner jointly. "This transaction is a central part of the growth strategy for both companies. It is a fair value for both in that it is structured as a market driven multiple of performance," said Messrs. Gauselmann and Turner.

"Today's announcement is a significant step in our continuous efforts to grow our casino market leadership with a very strong global U.S.-based partner," said Mr. Gauselmann. "The Gauselmann Group is the largest manufacturer/operator of coin-operated gaming machines in Europe. Atronic is the leading video slot provider in Europe, Russia, and Latin America, and is licensed in 196 worldwide gaming jurisdictions with a solid and growing presence in the United States. We offer products and services in 83 countries and 20 U.S. states, including 138 Native American tribes, and have become known for our highly competitive games, products, and services. This new alliance with GTECH will provide us with the additional capital and resources essential for our U.S. growth and overall increasing competitiveness in the global slot industry."

"The alliance with Gauselmann is the next logical step for GTECH to achieve its long-term strategic objectives within the gaming markets we have targeted," said Mr. Turner. "As the government-sponsored and commercial gaming markets converge, video gaming has become an expanding component of our growth strategy. Our interest in Atronic dramatically broadens our government-sponsored game and systems offerings, bring-

ing a new library of games, as well as commercial casinos and central monitoring system applications and services."

The transaction, which is contingent upon regulatory and gaming license approvals, and other closing conditions, is expected to be completed on December 31, 2006. However, starting immediately and during the next 24 months, Atronic and GTECH will pursue mutually beneficial global projects. As part of the transaction, beginning in 2012, GTECH has the option to purchase Gauselmann Group's interest in Atronic and Gauselmann has a reciprocal right to sell its interest to GTECH. There are also mutual put/call rights that may become effective before 2012, under certain circumstances.

"Atronic has a strong management team with a tremendous amount of experience in global sales and distribution, as well as platform and content development. Their current system portfolio provides a number of system modules that will enhance our current video central system, including player tracking, bonusing, and cashless wagering, thus enabling us to sustain market leadership," continued Mr. Turner. "Atronic also has wide-area progressive games that are currently operational in a number of U.S. jurisdictions." Atronic's recently launched e-motion(TM) video gaming platform is widely hailed as the industry's most ergonomically advanced video gaming machine. With its unique cabinet design, e-motion creates an exclusive player environment, with brilliant 3-D graphics, state-of-the-art technology, and advanced player interactive game concepts.

"With our recent investment in a new R&D facility in Arizona as part of our global R&D strategy implementation, Atronic expects to create a growing number of new games each year starting with 40 in 2005," continued Mr. Gauselmann. "Today, Atronic's library consists of more than 80 active video game titles with various cabinet styles, and numerous additional games and products are slated for market introduction to address each single global casino-style product segment."

"As the lottery industry evolves from system centric to more content centric, building a large and strong library of games will be essential to our long-term success," said Mr. Turner.

The Atronic transaction will also strengthen GTECH's Spielo subsidiary. The two companies are complementary and will ultimately enable each organization to leverage the other's strengths. Both companies have agreed to cross-license and distribute each other's content starting immediately. When appropriate, Spielo and Atronic will share infrastructure and work together on developing a common systems platform to serve all GTECH and Atronic markets. Founded in 1993, Atronic currently employs more than 800 people in its offices in Germany, Austria, Australia, Africa, United Kingdom, Peru, Nevada (Las Vegas and Reno), Arizona, Mississippi, and Peru. Atronic's revenues for its current fiscal year ending December 31, 2004 are expected to be approximately $200 million, about 25 to 30 percent of which will come from its North American customers.

Under this agreement, Atronic will continue to maintain its current operations and its established worldwide brand identity. A cooperation and integration plan is already under development in order to assure customers of uninterrupted services and a seamless transition. When appropriate, Atronic will begin collaborating with GTECH in order to maximize opportunities for both companies prior to the December 31, 2006 closing.

In the first full fiscal year, 2008, which ends in February 2008, GTECH expects Atronic's revenues to be in the range of $250 million to $300 million, and be earnings-per-share neutral to slightly positive.

For additional background information regarding Gauselmann Group, Atronic, and the transaction, please visit http://www.gtech.com and click on "Update on Atronic."

The Pull-Tab Theory of Slot Machines

A Low Tech Solution to a High Tech Problem

We have all seen the pull-tab lottery games in our corner convenience stores and elsewhere. Also called 'Nevada Tickets' up here in the Great White North, they have five perforated flaps that open to reveal a wonderful array of cash prizes. About as low-tech as you can possibly get, these tickets generally sell for a buck or less, with a top prize of up to $100. Although they aren't exactly the most stimulating game around, they are an excellent example for a discussion of slot math - especially considering the cycle of the machine.

I frequently receive questions about the machine's cycle and how it actually works. The concept is actually fairly simple, but when you factor in the machine's random number generator, things get a little bit more complicated. Perhaps it's time to take an in-depth study of the overall cycle of the machine and how the theoretical payout is determined. What's more important is how the machine actually plays and pays, especially when you consider casino revenue. If this helps you explain the machine's results to the accounting department, then it will be time well spent!

First of all, let's set up an imaginary pull-tab operation so that we can form a basis for our studies this month. Once we have that in place then we can easily make the transition to your slot machines, bringing it all together.

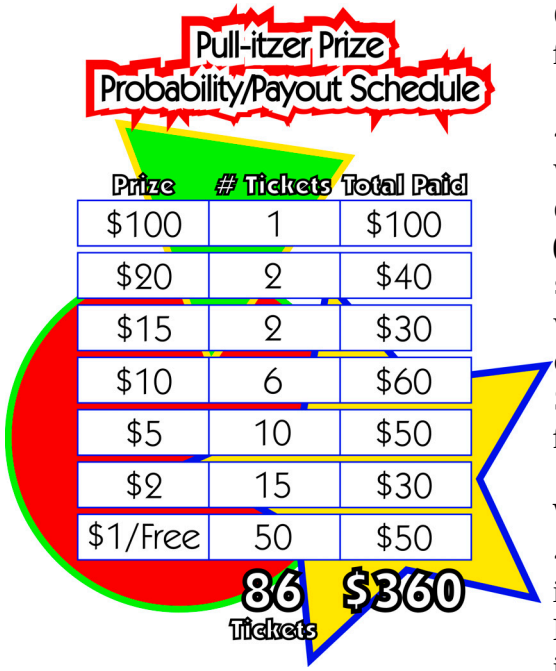
Slot Tech's "Pull-itzer Prize" Game

In order to make our operation, we need to determine what our tickets are going to look like (e.g.: what symbols will be on them), what payouts we will have and then determine a pay schedule so that we can calculate the payout probability of our pull-tab games. Yes, even the bottom feeders of the lottery games need a probability table and some form of mathematical calculations in order to make the game work. Fortunately, I've taken the time to do this for you so you can breathe easy again and not worry about the math.

Our tickets will include six symbols and seven winning payouts. The tickets will cost a dollar each (or, if you're a fellow Canadian, one Loonie). The prizes range from a free ticket to a hundred dollars. Figure 1 shows the pay schedule with the corresponding symbols we'll use.

Well, picking the symbols certainly was the easy part of

the equation. The payout schedule looks fine as well. As you can imagine, the $100 top award won't happen too frequently. The free ticket is actually a $1 prize. When we give away a free ticket, it costs us $1 in sales income, so we'll consider the free ticket as a $1 award. Mixed in with these winning amounts will be a certain number of non-winning tickets. We'll determine the amount by the amount of winning tickets we have, the total prize value of them, the selling price of the tickets and the profit that we want to make. Consider the following list of awards:



In our game, we will give away $360 in prizes. Therefore, we need to sell 360 tickets at $1 just to break even. There are 86 winning tickets. If we break even, then we need 360 - 86 = 274 non-winning tickets. If we want to make any money on this little endeavour (and we do), then we need to add some more tickets for our profit margin. We'll add in 40 more tickets making our game work with an even 400 tickets and see where we end up.

Tickets - 400 @ $1 = $400 in gross sales
Prizes - 86 tickets = $360 awarded in prizes
Profit = $40.

That gives us exactly 10% profit. Of course, this doesn't factor in the cost of printing the tickets, sales, marketing, etc. However, we don't need to consider these items in our virtual game and we will assume that we have no costs other than the prizes as awarded.

Off we go to the printers specifying our exact order.

400 pull-tab tickets 314 non-winning tickets (274 to break even plus 40 more for profit) (will not have three matching symbols in any one of the five windows) 86 winning tickets, consisting of one $100, two $20, etc., as per our previous figure.

When they arrive, we have 400 tickets neatly arranged in a small box ready for sales. Now we know our probability, we have a finite set of tickets in our set, we know how much we will take in and how much we will pay out. We'll make a hefty $40 for each box of tickets we sell. Since we ordered five boxes, we'll have $200 when our tickets are all sold!

Each box of 400 tickets represents the 'cycle' of the pull-tab game. It consists of every possible combination of ticket, both winning and non-winning (Doesn't that sound better than losing?). We can now study the probability of our game. However, this is where things greatly differ from a slot machine and this is where we start to learn about the variance that accounting is always nagging you about! Let's consider a theoretical day at our pull-tab booth and study how our sales go.

A Day at Our Ticket Booth

After setting up our display, Randy Fromm walks by. He's purchasing notebooks for the upcoming TechFest 11 conference. Walking out with cartons of books, he sees our booth and walks over. Since he's the first customer of the day, we know exactly what his chances of winning are. We have opened one box and put the 400 tickets into our Lucite ticket holder. Reaching in, he carefully selects his ticket. He has one chance in 400 of getting the $100 prize, or 1/400 chance (0.0025) and 314 chances out of 400 of picking a losing ticket (314/400 = 0.785). He carefully peels back each tab without finding any matching symbols. Grumbling away, he tosses the ticket into the recycling bin (he's very environmentally conscious!).

He then plops down another dollar and selects another ticket. His chance of the big win is the same - 1/400 chance. However, there is one less losing ticket. It has been removed from the mix. The

first time he had 314 chances out of 400 of getting a losing, ticket. Now, he has only 313 chances. His probability of selecting a ticket incapable of generating a return on investment (losing ticket) has decreased from 0.785 to 0.7825. Therefore, his chances of winning have increased. Carefully he peels back the tabs and finds three mixed bar symbols. Handing over his ticket to you, you give him $5. There were 10 mixed-bar tickets, with probability of 10/400 or 0.025. However, he's removed one from the mix, and now there are only nine (9/400 or 0.0225). He is up $3 and we're down $3.

Another $1 changes hands and he grabs yet another ticket. Against all odds, he opens up mixed bars AGAIN, patiently tapping his foot while waiting for his $5 payout. Now there are only eight mixed bar tickets, with a probability of 8/400 or 0.02). We have removed two mixed bar tickets from the mix and one non-winning ticket. There are only 397 tickets in the bin. After paying his $5 prize we try to rush him away from our booth but out comes another dollar and out goes another ticket.

He loses on this one, much to our relief, so we're down to 312 non-rewarding tickets or 312/400 = 0.780 probability of not winning. Sucker!

Not to be discouraged, and still up $6, he figures that buying another ticket he'll still be up at least $5, so another ticket is removed from the bin. After four windows are peeled back and no winning combination yet, he gently opens the last remaining window. Red 7....Red 7.... (Are you ready?) Red 7. He doesn't buy the 'ticket malfunction' story, so $20 makes it to his wallet. His wife decides to take part in the fun and he buys her a ticket. The first window she opens shows three Red 7s as well, and another $20 leaves our sorry little hands. He's made $25, she has $19 profit, and they both skip away with their supplies for TechFest.

There are no more $20 winning tickets left in the box (thank goodness), but we still have to worry about the $100 winning ticket. However, we know that by the time we sell all of the tickets, we'll be up $40. There's no way around it - we know what's in the mix and we'll make $40. Guaranteed.

This isn't like a slot machine game at all!

There is one key element in this pull-tab game, which makes it very easy to determine probability, wins, loses and profit. Every time someone plays the game, they have a different probability of winning (or losing). Each ticket is removed from the box, and each time there are less combinations available. The next person to visit our booth today cannot win $20. There aren't any more $20 winning tickets left! They don't know that, but we do. If, for some weird stroke of luck, we sold all of our winning tickets in the first 200 games, we would have nothing remaining but 200 non-winning tickets. The people buying the tickets could not win. Not a dime. No chance. Nope. Is it fair? Well, in the end, there is a set series of probabilities for winning and losing; it's just that all of the winning tickets are gone. We have to sell 160 of those losing tickets just to break even.

This is the one big difference from our pull-tab game and a slot machine. The slot machine does not remove a winning combination once it's been paid. It also doesn't remove the losing combination when it hits, either. The gaming commissions require that every spin have the same probability of winning or losing as the game prior and the next game and the one after that. Every player in every game has the same chance as every other player.

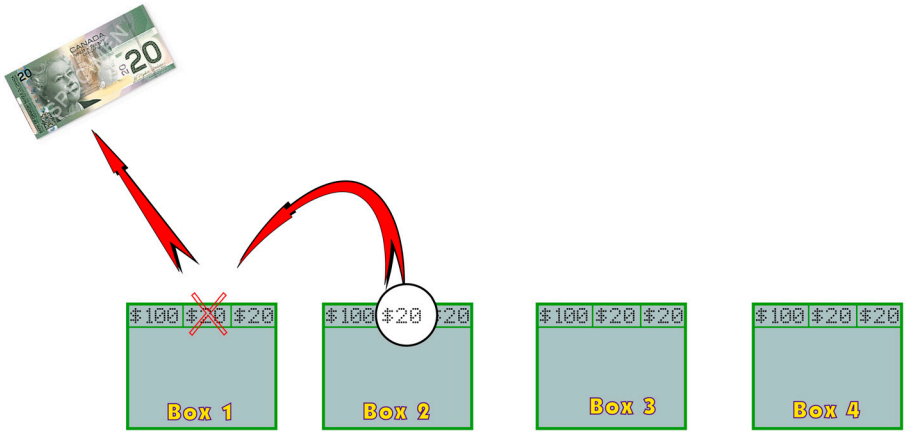
Although it's very fair for the patrons, it makes our analysis of the slot machine very complicated. Let's convert our pull-tab game to work the same way that a slot machine does, and see how things work out.

Or maybe it is.

Suppose that we have decided that we want every person buying any ticket to have the same probability of every winning or losing combination as every other player. It's

not as complicated as it sounds, and it does provide a good understanding of how the slot machine math and cycle work.

Let's start back at the beginning. We've opened up our first box and filled the container with the 400 pull-tab tickets. Up walks Mr. Fromm and he carefully selects his ticket. Let's say that he wins $20 with three Red 7s.



As one $20 winning ticket is removed from the mix, we immediately replace it with one from our next box.

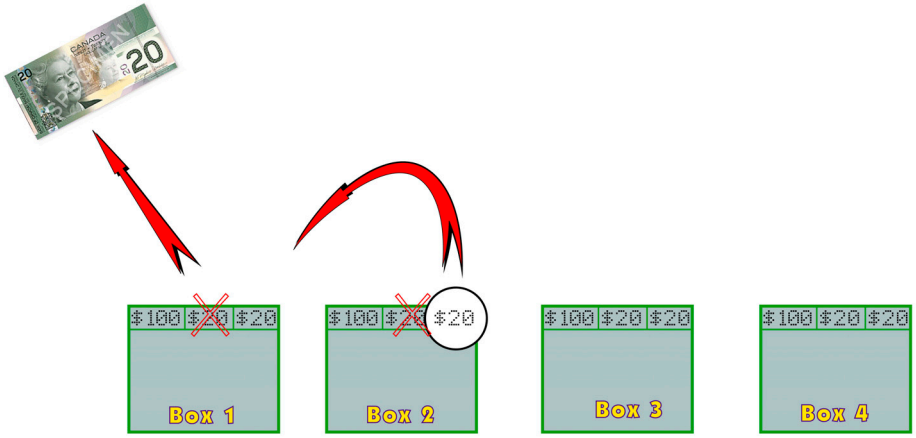
ATTENTION OPERATOR!

This ticket will win

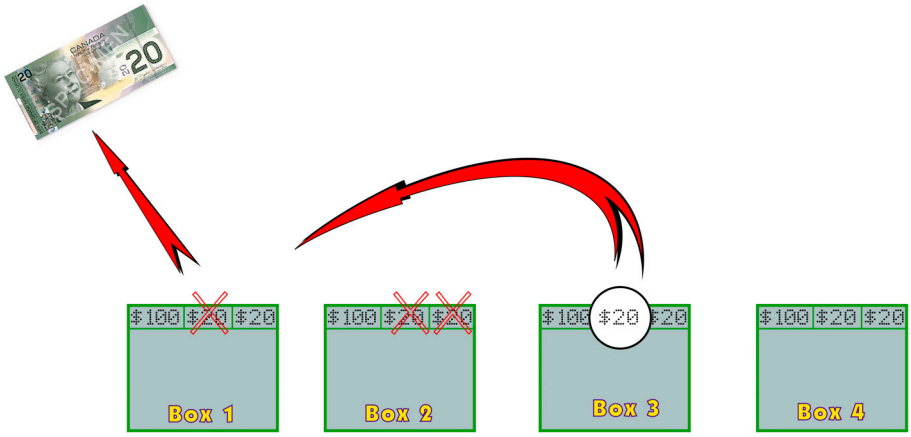
$20.00

REMOVE BEFORE PLACING TICKET IN BIN!

Now, we need a way to replace that $20 winning ticket in the box in order to keep the probability the same. We won't put his ticket back in (it would be too easy to find), so we open up the next box (Box #2) and remove a $20 winning ticket. We obviously need some way to identify this, so we can assume we have some removable marking on the outside of the ticket to show us what the ticket contains. If a $20 winning ticket is once again removed by a player, we must replace this one also. Here we would remove the second $20 ticket from box 2. The next time that a player selects a $20 winning ticket, we have to replace it with one in box 3, since box 2 doesn't contain any more $20 winning tickets.



After another $20 winning ticket is removed from the mix, we immediately replace it with the second one from our next box.



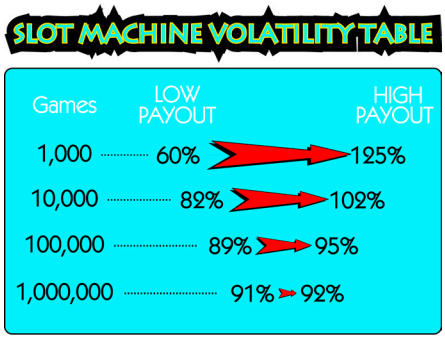
By the time that another $20 winning ticket is removed from the mix, we're getting the next replacement ticket from Box 3.

By doing this, we always ensure that every possible combination of winning and losing ticket is represented in the mix. Whenever we remove a ticket, we immediately replace it with another one the same. You can see that we have 'borrowed' a number of tickets from the second box, the third box, and maybe even the fourth and fifth.

By setting up the probability table during the design of the game, we know that we will make a 10% profit. Our payout percentage is therefore 90%, and our hold percentage 10%. However, when we 'dip' into other boxes to replenish the drawn tickets, we may end up paying out more of one particular combination than exists in the actual cycle. In our example, we paid out both $20 winning tickets from box 1, taken both $20 winning tickets from box 2 and one $20 winning ticket from box 3. In order to keep our stock up, we always have two $20 winning tickets available in the first box. Therefore, we have paid out three of them, with two still in the mix. Instead of paying out $40 total from our game's cycle, we have paid out $60, and have the potential to pay out another $40 from the two remaining. Our payout will likely be higher than it should be. Alternatively, we might be dipping into non-winning tickets from box 2 or box 3 which would then reduce our overall payout.

In order to relate our pull-tab scenario to a slot machine, let's consider the following example. We have a slot game that pays out 50% and holds 50%. We have a player who gets a $20 jackpot. If the coin-in is $10, then we would normally pay out one-half of this, or $5. The $20 jackpot would mean that we have paid out $5 + $20 = $25. We have taken in $10, so our payout is $25/$10 = 250%. We're paying MUCH more than our theoretical 50%. Let's fast forward and assume that we have taken in $10,000. Our payout would be $5,000. A player wins that same $20 jackpot, so we have paid out $5,020 and taken in $10,000. Our payout is $5,020/$10,000 = 50.2%. The more games we play, the less affect these little wins have.

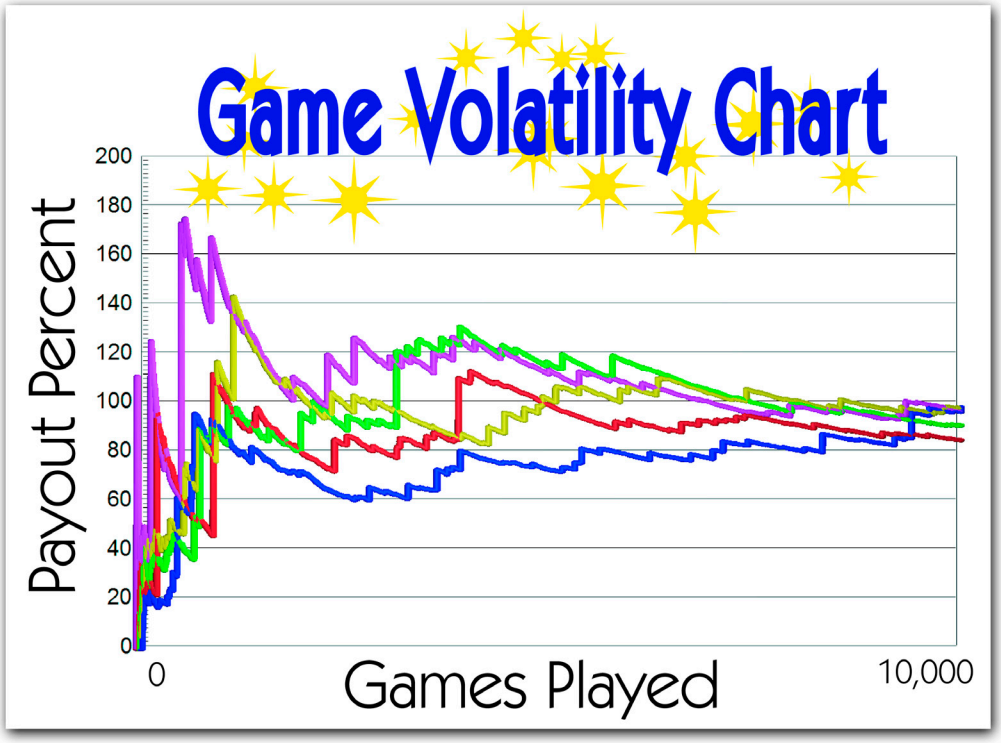
This is evident in our volatility index table. At 1,000 games, we might find that our payout is somewhere between 60% and 125%. At 10,000 games, the range will be narrower, in the 82% to 102% range. At 100,000 games the range narrows again, perhaps from 89% to 95%. As we have more and more games played, each win accounts for less of the overall machine's payout so it doesn't skew the numbers as much.



If we could always keep within one box (or cycle) at a time, by removing each combination as it is randomly selected, it would be much easier to analyse the payout of the machine. When we have to dip into other boxes (or cycles) in order to maintain a consistent probability, it makes the analysis of our game play more difficult. It also makes it harder for your accounting department to understand that the game is paying within a normal range, even though it is above or below the theoretical payout percentage. If we could change the odds and remove each combination as they are selected, we would end up exactly on the money every time. As we dip into other 'cycles,' our numbers jump up and down depending upon the winning and losing amounts we have to borrow. In the long term, however, they just don't affect the numbers overall. You could have a Thrillions(r) slot game pay a $500,000 jackpot and then hit again in the very next spin. This will greatly skew the numbers. That, too, will work out in the end.

Let's examine a couple of examples from a VC Slots(r) simulation. The graph shows the payout percentage as the game is played more and more.

The graph shows a simulation of five identical machines. They all have the same paytable, probability table, etc. Each machine starts with zero games and is played for 10,000 games. Each machine



actual payout will always vary from the theoretical payout. In the end, it will come very close to theoretical. When analysing slot revenues over the short-term, you must keep in mind that there will be a variance. Check the volatility table for a general guideline for just how much variance you may expect. [Refer to Slot Tech Magazine's December 2003 article: Slot Machine Volatility Index.]

is shown by an individual line on the graph.

Notice the variance at the start where the games pay out a lot, a little, and everything in between. Large payouts early on skew the graph upwards. Frequent low-paying or non-paying games early on skew the graph downwards. In the end, however, each of the 5 lines start to come together close to the theoretical payout value and they all come closer together.

For this particular game, the normal payout is 87%. This graph clearly shows that the probability does work itself out in the long run. Variances are a short-tem event and time and game play will bring everything into the normal range. At 10,000 games, there still exists a variance with some machines paying above the normal payout and some paying below. However, they are all getting close. At 100,000 games, the five lines would all come very close to each other.

Some games have a higher volatility than others and the only difference in their graph would be the amount that the lines rise and fall away from the normal payout, especially early on. They may take more games to come together but again, they too will fall into place.

PULL TAB TICKET Conclusion

Our examination of the pull-tab tickets provides a good comparison for slot machine math. Both the slot machine and the pull-tabs must have a pre-defined cycle with exact probabilities. With a slot machine, however, you don't remove any combination of symbols when they are selected. This means that you will 'borrow' combinations from other cycles, so your

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