**Trouble Shooting Summit Systems Slot Machines**

**Many of the electronic problems on the Summit Systems slot machines are related to the connectors at the rear of the reel assembly**.  All of the controls (inputs and outputs) to the controller board have to pass through these two connectors.  Clean and burnish (brighten) the connectors.  Sometimes a contact cleaner/lubricant can help after the pins have been burnished.  Spray both the male and female connectors for best cleaning effect.

Note: As I receive inquires about machine problems, I will try and add the cause and solution to this page.

**Identification of the Boards:**

The **Top board** of the electronics is the **'Interface Board' (Red Handle)**

The **Middle board** is the **'Slot Controller Board' (Yellow Handle)**  The battery is normally located on this board.  Most boards have the battery removed.  This does not cause any problem with the machine operation. See '[Battery Issues](http://www.hms-electronics.com/slot_machines/trouble_shooting.htm#Battery%20Issues)' in this section

The **Bottom board** is the **Options Board** which is the interface to other machines when the machine is used in a progressive jackpot type arrangement (multiple machines are connected together).   Normally, this board is not installed.  However, if you purchase a machine with this board installed, you may need to keep the board in to have the machine play.  The options board is also used to control the sound while the reels are running.  This is only if you have a sound board in your machine.  The sound board is usually located in the top section of the slot machine cabinet.

**Over Indexing: (see Tilt Codes)**

Over indexing can be caused by one of two things.  Sticky release mechanism or faulty (intermittent) encoders.  If you suspect the encoders, go through the reel alignment procedure.  This will most likely show up a faulty encoder.

**Extra Coins Paid out (occasionally):**

This usually happens when the clutch on the motor fails to engage or is weak.  Try adjusting the clutch device on the hopper motor.  Also, the coin out switch may need slight adjusting, see the next paragraph

**Extra Coins Paid out and Tilt, Flashing 0 or # with any win!**

The slot controller board relies on the feedback from the coin activated switch on the hopper.  Each time a coin passes through the feed mechanism it activates a lever and in turn activates a switch.  This switch feeds the 'coin out' signal to the slot controller board.  So first make sure that the switch is being activated by the coins.  To see if the slot controller board is registering the switch input perform the following test:

Note: Start with **No tilt code** should be present on the machine (see 'Battery Issues' to disable the tilt code retention).

1. Play a game, single coin:

2. During the game play, hold the coin activator lever up (on the hopper) to simulate a coin being fed out.

3. At completion of play, the meter should be alternately flashing a -8- and an 0.   This code is coin out jam (switch closed)

4. When releasing the lever, the -8- should change to a -9-.  Press the hopper reset and the -9- should change to a 1.  1 means it registered 1 coin as being fed out.

5.Then when you close the door (activating the door switch) the machine should resume play.

First thing is to determine if you get the -8-.  If you do, the switch activated by the coin out lever may just need adjusting.  You can adjust the lever activated switch as there is a screw to accomplish this.  The lever that the coins actuate has a roller near where the coins exit the hopper.  At the opposite end of the lever, there is normally an adjusting screw that actuates a micro switch as the coins go out.  The switch has to 'toggle' with each coin out.

If you don't get the -8- tilt code, the slot controller board is not processing the signal.  You will need a new slot controller board or yours repaired.  The chip that buffers the hopper switch signal is the ILQ-74.  Changing the chip may correct the problem.  We now have this chip in stock.

**Coins Won't pay out (flashing 0 on the right Digit of the Meter Display):**

1. Check to make sure that there are no coins jammed in the coin disk of the hopper and that the disk can be rotated freely about 1/8 of an inch (or more).  The electronics to control the hopper are located on the **interface board** and will require repairs.  The hopper also has a circuit board.  Rarely, this board goes bad.   If the hopper won't run, you get a flashing zero on the display along with the tilt light. The flashing zero meaning that zero coins were paid.  This problem could be related to bad connections on the plug and jack assemblies on the hopper or the reel mechanism.  To restart payout, press the hopper reset button and close the door (activating the switch on the top hinge of the door).  After 3-4 seconds, the hopper should activate.  See the above paragraph for clearing the tilt and restarting the payout! Also, see 'Battery Issues' to disable the tilt code retention.

**Clearing the flashing Zero on the Right Digit of the display:**

If the hopper runs, then pressing the hopper reset button and closing the door (activating the switch connected to the top hinge), should clear the flashing zero and allow the hopper to run.   If the flashing zero stops for a few seconds, then comes back, it's because the hopper won't run or the hopper switch is failing to signal the coins going out. Also, see 'Battery Issues' to disable the tilt code retention.

**Continuity test for the coin out switch of the hopper:**

Testing for continuity using an ohm meter.  0 volts is either the negative end of the battery or the black with red trace wire on the coin in switch (easy to get to). The 'coin out' input resistor on the 'slot controller' board is R10.  With the machine off, if you are measuring the resistance between 0volts and the end of the resistor that goes to the edge connector (circuit board gold pins), the resistance should go low (about 1 to 100 ohms) when the coin out switch is activated.  If the resistance goes low, you have good continuity in the machine harness and connectors and the problem is the slot controller board.  If the resistance does not go low, you have a problem with connections in the system (usually the rear connectors of the reel assembly).

**Testing with a volt meter (power on):**
R10 should have about 3.5 to 4.0 volts on it with the coin out switch open (either end of the resistor).  If the resistor has 5 volts, the opto coupler (ILQ-74) is shorted and will need replacing.

**Repairs and Board Testing**

Repairs and diagnostics are available according to the prices listed below:

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Diagnostic Fee | Repairs (Diagnostic Fee Included) | Notes: |
| Interface Board (Red Handle) | $20 | $50 | Top Board |
| Slot Controller (Yellow Handle) | $20 | to be quoted | Middle Board, will quote if repairable |
| Power Supply | $20 | to be quoted | If the power supply is physically damaged, just purchase a new one as the repairs are very difficult. |
| Detectors | $20 | $50 | Located above the boards, mounted to the plate assembly and aligned between the reels. |
| Hopper (coin out mechanism) | $20 | to be quoted | In the bottom of the machine |
| Reel Assembly | $40 | to be quoted |   |
| Options Board (Blue Handle) | to be quoted | to be quoted | Bottom board (not always present)  |
| Board Set (including Power Supply) | $50 | to be quoted | $40 if no power supply is included. |

You don't need to call, just pack up your boards, send them to us, Attention: Dick Harkey. Be sure to include your name, return address, contact information and description of service requested.  Be sure to specify return method of shipment.  Pack your boards using some kind of protection between the boards (IE. Styrofoam, foam, cardboard or newspaper).  The slot controller board is subject to static electricity damaged and should be wrapped in an anti-static material (pink bubble wrap or metalized film available at most 'Mail Boxes Etc' and others.  I usually will get back to you in 2-5 working days from receiving the parts.  Note:  The power supply is easily removed.   This is the unit with the little on/off switch and the 2 LED's.  On the left side there is a recesses to reach in and pull it out.

**Won't accept coins:**

The machine has to be in a non tilt mode and the processor on the slot controller board has to be running in order to accept coins.  If the machines accepts coins but does not register the coins, the slot controller board may be defective.  There is an OEM chip in the slot controller that is no longer available and is always the reason for not counting the coins in.  You can order a replacement board or send in your board for test.  Sorry, I don't repair slot controller boards.  If you purchase a slot controller board, I will apply the diagnostic fee toward the purchase of a new board.

**Accepts and registers coins but won't start play.**

1. If the handle is allowed to be pulled (handle release solenoid was activate) then the slot controller board is waiting for a game in progress signal from a switch.  The switch is located on the side of the reel assembly and the two wire from the switch go to the back of the electronics mother board and plug in there with a 2 pin plug.  Make sure that the plug is attached and that the switch is activated by the pulling of the handle (launching of the reels).

2. If the handle is not allowed to be pulled, either the interface board is not turning on the solenoid for the handle release or the switch on the handle release solenoid/activate lever may need adjusting. (See above for board repairs and or testing).

Battery Issues: (The Battery is located on the Slot Controller Board) [Yellow Handle]

The battery is used for several things.  It keeps track of the coins played, the number of coins in the hopper, the status of the last game play and of course **maintains the last tilt code**.  To erase the memory, pull the jumper located next to the battery.   (The jumper has to be removed for 5-10 seconds for the board to lose memory). When you turn the machine back on a '-0-' will appear in the coin payout window.  This code just means that the memory was re-initialized. When you press the hopper fill button, you are telling the machine that the hopper is full of coins (now).  Typically the full count is around 2000 coins.  So, if you hit a jackpot and don't have enough coins to pay out, you have to re-fill the hopper, press the hopper fill button and close the door.  Closing the door signals the slot controller board to continue paying out.   Note: The battery is not necessary for correct operation of the machine.  One customer found that without the battery, he would hit the jackpot after power up and 20-30 plays.  This is the only instance of a battery related issue that I have heard of.

**Coins Accepted, but Handle won't release**

The handle release coil (located above the handle mechanism) has to be energized thru the back connectors of the reel assembly to release the locking lever for the handle.   Place a metal screwdriver near the release coil.  If you feel the magnetic pull of the coil, then the problem is mechanical.  If there is no magnetic pull, then one of the following applies.

1. The interface board is not energizing the coil
2. There is no connection thru the back connectors of the reel assembly
3. The interlock switch operated by the locking lever is not making contact
4. The release coil is open.  This can be confirmed by measuring the resistance of the coil.

If the problem is mechanical, most likely there is a groove that has been worn into the release lever.  This is where the armature of the coil and the release lever come in contact with each other.  The armature should be fairly easy to push and release the locking lever.  If it feels 'stick' lubricate or file off the groove in the release lever so that it allow smooth movement of the armature.

**Handle Release Issue:** New and Old Interface boards not completely compatible.  The old style interface board (red handle) had mechanical relays (black rectangles).  The new style interface board has opto-couplers and Triacs (solid state).  The old style interface board applied 120 volts to the handle release solenoid.  This would be a gray/yellow stripe wire as the 120 volt source, and blue/white stripe as the return of 0 VAC.  The new interface board utilizes 50VAC to the handle release solenoid and still uses the gray/yellow wire..  The common or return for the 50VAC is a **yellow wire**.  If you have this condition with old wiring connections but a new interface board, then remove and tape the blue/white wire from the handle release solenoid.  Locate and make connection to the yellow wire somewhere in the machine to the handle release solenoid.  You should end up with a gray/yellow wire and yellow wire on the each of the solenoid connections.   Note:  The 50VAC is isolated from the 120 VAC, this is why there is no power to turn on the handle release solenoid!

**Tilt's often:**

Please email me the tilt code, and I will put an answer to the tilt reason here on my web site within 48 hours (unless I am on vacation).

**Tilt's Codes Won't Clear**

After pressing the Hopper Reset button on the power supply, the machines waits for the door to be closed.  There is a switch mounted behind the upper hinge of the door and the switch should be activated by the hinge (door) closing.  There is about a 1 second delay before the game is allowed to proceed.  There should be a plastic piece mounted to the plunger of the switch. If the plastic piece is missing the switch will not be activated by closing the door.  The plastic piece is about 1/2 inch square and about 3/8 inch deep.  I have them in stock if you want to order it (complete door switch).

**ILQ-74 Inputs and Outputs (switch buffer)**

The ILQ-74 chip is used to buffer all the switch signals of the machine.  It is the most common failure for the slot controller board.  IE won't read the coin in, count the coins out, etc.  The following is a list of inputs and outputs.  Note:   All of the inputs go to resistors and then the ILQ-74 chip.  So I am giving all the connections on the slot controller board. Use the battery - (minus) connection as the common measuring point.  Same as the black wire with the red stripe on all the switches.  You can order this chip from me if you have the skills to replace it.

* Connections are to slot controller board, to the input resistor to the input pin of the chip to the output pin of the chip.
* J/P RESET (Jackpot Reset located on the side of the machine). Pin 70, to R9 to Pin 7 of ILQ-74, output Pin 10 (if the output of the ILQ-74 is bad, the game is waiting for the signal to go high).  Nothing will happen as long a this signal is wrong.
* Coin-In Switch (Located on the door under the coin mechanism.  Pin 76, to R12 to Pin 2 of ILQ-74, output Pin 15 (won't register coins)
* Coin-Out Switch (Located on the Hopper).  Pin 72, to R10 to Pin 6 of ILQ-74, output Pin 11 (doesn't count the coins out)
* Door Switch (Located behind upper hinge). Pin 74 to R11 to Pin 3 of ILQ-74, output Pin 14.

Note: While measuring the input or output of the ILQ-74 the related input and output should change state as the switch is being pressed.

**Sounds and Sound Issues**  [(Pictures)](http://www.hms-electronics.com/slot_machines/sound_boards.htm)

Some machines were wired for sound and others only used the jackpot bell as coin-in indicator and win indicator.  The machines that were wired for sound have a sound board and speaker behind the upper light assembly.  The sound board is interfaced to the machine via a small board mounted to the cabinet just behind the reel assembly.   The sound interface board has a 20 pin connector on the left and a 16 pin connector on the right.  The most common problem with sound issues is that one of the reed relays on the interface board becomes stuck (switch closed).  By lightly striking the reed relays (small rectangular black body) you can un-stick the contacts.  The indication is that a chirp kind of sound is generated when the machine is powered up.

There are 3 sounds generated by the machine.  Coin-in (the coin-in switch is directly wired to the first reed relay (on the left).  Reels running, this sound signal comes from the option board.  I have just designed a replacement for the options board (blue handle) for those who would like to get the reel sound running.   The last sound is of course the jackpot or coins paid sound.  This sound is generated by the 'bell' circuit.  6.3 volts AC is connected to the interface board and the board has the components mounted on it to rectify the AC to DC to drive the 5 volt reed relay.

All of the sound boards that I have seen utilize opto-isolators for the input commands.   You can troubles shoot the board sound board by performing the following.

1. remove the 12 pin connector on the side of the board.

2. Short pin 4 and 5 of opto-couplers U1, U2, U3 (respectively).  This should activate each sound.  Pin 1 of the opto-coupler (H11B2) has a 'dimple' and you count counter clockwise.  So pins 4 and 5 are on the opposite side of the opto-couplers as the input connector.

If the board makes sound, the problem is the interface board behind the reel assembly.

**All Reels don't Spin when Handle is pulled or don't always spin**

Turn off the power, pull the handle,  If all reels launch the problem is a shorted driver on the interface board.  If some reels don't spin, the problem is only mechanical.  Lubricate all the joints on the stop levers (the levers and mechanism for stopping the reels).  All of the pivot parts of the stop levers should move freely.

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