UNIVERSAL ®

OPERATION MAINTENANCE AND PARTS MANUALS

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1. FEATURES OF THIS MACHINE

- All functions and mechanisms are controlled by a microprocessor (CPU).
- A pulse motor conducts all reel rotation and stoppage - stop position is controlled by random logic signals.
- All check functions are automatically performed. Useful functions, such as error code display, self-test and meter reading, are incorporated for user's convenience.
- Mechanical elements in the driving section have been significantly reduced to both minimize wear and to ensure long life.
- A photo sensor conducts all coin identification.
- Total internal unitization enables each unit, such as a hopper unit, a reel unit, a logic board, a power supply unit, etc., to be simply installed and removed.
- All parts being used in this machine are of the highest quality and due consideration has been given to their layout and configuration.

- Each model is available as stand alone, link progressive, or individual progressive.
- Individual models can be used on the same link progressive.
- Progressive Non-Progressive is dip switchable.
- Various dip switch setting for partial pays are available.
- Each machine is equipped with a two wire female plug ready to plug into any one of three manufacturers' progressive controllers without modification to the Universal Slot Machine.
- Individual bright light displays are available.
- Tower light unit and sound PROMs are included in machine price.
- Models are available as credit or non-credit.
- Outputs for on-line computer systems are available as an option.
- The Universal Slot Machine is supported by one year warranty.
- The Universal Slot Machine has 32 stop capability.

2. OPERATION AND MAINTENANCE

A. INSTALLATION

- 1. Install on a flat surface.
- 2. This machine is designed for indoor installation, it should not be installed anywhere outdoors.
- Avoid locations subjected to direct sunlight, high temperature/humidity, violent vibrations, dust, etc. Also avoid locations where dangerous objects or fire-fighting apparatus are stored - be sure not to block an emergency exit.
- 4. In order to prevent any troubles occurring during play, be sure to fix the machine onto the slot stand with 4 bolts as shown in Fig. 1.



Note: After installing the machine, remove the two shipping screws that fix the hopper unit on the cabinet floor.

B. BEFORE APPLYING POWER FOR THE FIRST TIME

- 1. Check for damage caused by mishandling during shipment.
- 2. Make sure that all connectors, and similar devices are not disconnected.
- 3. Make sure that all reels are spinning properly.
- 4. The grounding terminal provided on the machine should be connected to "earth" without exception.

C. HOW TO OPERATE

- 1. When the machine is switched on, it will test itself and any malfunctions will be indicated to the attendant on the "ERROR" code; refer to the "ERROR" code clause for an explanation.
- Make sure the machine is well ventilated, if the temperature of the IC and transistor is over 60°C, performance cannot be guaranteed.
- 3. Whenever connecting the solid-state module power cord to, or disconnecting it from, the outlet, be sure to turn the power off.
- 4. Be sure to use rated fuses.

D. BEFORE DETERMINING WHETHER THERE IS A'REAL' MALFUNCTION, PLEASE READ BELOW

1. The slot machine is broadly divided into five electrical component sections; the power unit, the main logic board, the reel unit, the handle unit and the hopper unit. These are wired together and if any of them malfunctions, the slot machine as a whole will not work normally.

When you think that there is something wrong, check all five sections for minor easy to remedy disorders - these may be corrected either on the spot or with a modicum of repair work.

If the checked section seems normal, test other related parts, too.

Note: Be sure to use only the fuse indicated!

2. Check the fuse: If a fuse also blows, then an other part is out of order.

- Is the plug securely plugged in? Isn't it disconnected? Make sure to check for proper contact and that power is "OFF" before plugging or unplugging the unit.
- 4. If a normal image does not appear when turning the machine "ON", try "SELF-TEST PROGRAM".
- 5. Even if the solid-state module seems to be out of order, do not check the circuits with a circuit tester, or similar device since the internal voltage of the testing may sometimes destroy the IC.
- Be sure all socketed IC's are properly seated in their sockets. Applying power with an IC installed backwards may destroy it along with other related circuits.

Although Universal products are manufactured with the utmost care they may malfunction when used for long periods. Therefore the machine owner or manager should check the condition of the machine daily.

3. SPECIFICATIONS

A. ELECTRICAL SPECIFICATIONS

| 1. | Power supply | 100V AC |
|----|--------------|---------|
| | | 115V AC |
| | | 120V AC |
| | | 220V AC |
| | | 240V AC |
| | | |

- 2. Power consumption 180W
- 3. Fuses



B. OVERALL MACHINE DIMENSIONS

TYPE "A" WIDE BODY a)



| | mm, kg | |
|---|--------|--|
| | 177.80 | |
| | 558.80 | |
| | 687.32 | |
| - | 402.60 | |

| | | inch, lbs | mm, kg |
|----------------------|--------|-----------|--------|
| TOWER LIGHT UNIT | Height | 7 | 177.80 |
| | Height | 22 | 558.80 |
| LOUD BOWL STAND | Width | 27 — 1/16 | 687.32 |
| | Depth | 19 | 482.60 |
| | Height | 22 | 558.80 |
| COIN TRAY STAND | Width | 27 – 1/16 | 687.67 |
| | Depth | 16 — 1/16 | 407.98 |
| MACHINE SHIPPING WT. | | 231.48 | 104.16 |
| MACHINE BASE DEPTH | | 13 - 3/4 | 349.25 |
| | Height | 20 — 5/8 | 507.00 |
| TOP AWARD GLASS | Width | 20 - 5/16 | 498.00 |
| | Height | 9 — 5/8 | 235.00 |
| REEL GLASS | Width | 20 - 5/16 | 498.00 |
| | Height | 8 – 3/8 | 205.00 |
| BOTTOM GLASS | Width | 20 - 5/16 | 498.00 |

A BALLY type stand can be used with slight modifications, UNIVERSAL has 2" less depth.
Custom glass which fits in a BALLY type machine can be installed in a UNIVERSAL slot - minor modification required.

b) TYPE "B" WIDE BODY



Fig. 5

| | | inch, lbs | mm, kg |
|----------------------|--------|-----------|--------|
| TOWER LIGHT UNIT | Height | 7 | 177.8 |
| | Height | 22 | 558.8 |
| LOUD BOWL STAND | Width | 27 — 1/16 | 687.32 |
| | Depth | 19 | 482.6 |
| | Height | 22 | 558.8 |
| COIN TRAY STAND | Width | 27 – 1/16 | 687.67 |
| | Depth | 16 - 1/16 | 407.98 |
| MACHINE SHIPPING WT. | | 224.87 | 102.82 |
| MACHINE BASE DEPTH | | 13 – 3/4 | 349.25 |
| | Height | 13 – 1/4 | 325.00 |
| TOP AWARD GLASS | Width | 20 – 5/16 | 498.00 |
| REEL GLASS | Height | 9 – 5/8 | 235.00 |
| REEL GLASS | Width | 20 - 5/16 | 498.00 |
| | Height | 8 – 3/8 | 205.00 |
| BOTTOM GLASS | Width | 20 - 5/16 | 498.00 |

• A BALLY type stand can be used with slight modifications, UNIVERSAL has 2" less depth.

• Custom glass which fits in a BALLY type machine can be installed in a UNIVERSAL slot - minor modification required.

c) TYPE "C" WIDE BODY



| | | inch, lbs | mm, kg |
|----------------------|--------|-----------|--------|
| TOWER LIGHT UNIT | Height | 7 | 177.80 |
| | Height | 22 | 558.80 |
| LOUD BOWL STAND | Width | 27 - 1/16 | 687.32 |
| | Depth | 19 | 482.60 |
| | Height | 22 | 558.80 |
| COIN TRAY STAND | Width | 27 – 1/16 | 687.67 |
| | Depth | 16 - 1/16 | 407.98 |
| MACHINE SHIPPING WT. | | 216.05 | 97.21 |
| MACHINE BASE DEPTH | | 13 – 3/4 | 349.25 |
| | Height | 8 - 3/8 | 205.00 |
| TOP AWARD GLASS | Width | 20 - 5/16 | 498.00 |
| | Height | 9 – 5/8 | 235.00 |
| REEL GLASS | Width | 20 - 5/16 | 498.00 |
| | Height | 8 - 3/8 | 205.00 |
| BOTTOM GLASS | Width | 20 - 5/16 | 498.00 |

 * A BALLY type stand can be used with slight modifications, UNIVERSAL has 2" less depth.
 * Custom glass which fits in a BALLY type machine can be installed in a UNIVERSAL slot - minor modification required.

4. NOMENCLATURE OF EACH PART

A. OUTSIDE



Fig. 7

| Ref. No. | Name | Ref. No. | Name |
|----------|--------------------------|----------|---------------------------|
| 1 | Tower light | 9 | Coin slot |
| 2 | Reel glass | 10 | Last game (7 seg. LED) |
| 3 | Change button | 11 | Coins played (7 seg. LED) |
| 4 | Bottom glass | 12 | Win meter (7 seg. LED) |
| 5 | Coin tray | 13 | Handle lever |
| 6 | Meter reading key switch | 14 | Jackpot reset key switch |
| 7 | Front door | 15 | Top glass |
| 8 | Door key | | |

B. INSIDE



| Ref. No. | Name | Ref. No. | Name |
|----------|--------------------------------|----------|--------------------------|
| 1 | Lamp board | 10 | Hopper unit |
| 2 | Main power switch | 11 | Handle mechanism |
| 3 | Power unit | 12 | Reel unit (3-reel) |
| 4 | Fuses | 13 | Sound controller |
| 5 | Rejector | 14 | Coin test switch |
| 6 | Coin switch (photo sensor) | 15 | Test switch |
| 7 | Speaker | 16 | Door switch |
| 8 | Main logic board | 17 | Reset switch |
| 9 | Hopper overflow control switch | 18 | Electromagnetic counters |

C. P.C.B. MOUNTING POSITIONS



5. MACHINE FUNCTIONS

A. SWITCH POSITIONS AND NAMES

a) OUTSIDE



b) INSIDE



Fig. 10

B. DESCRIPTIONS OF SWITCHES

The following numbers and descriptions correspond to Fig. 10 and 11.

RESET SWITCH

The "RESET SWITCH" is used to reset a game when an error code is indicated and a game is invalid, or to cancel the "SELF-TEST PROGRAM" and to return to a normal game.

2~ DOOR SWITCH

The "DOOR SWITCH" is used to check to see if the front door is open or not. It is "OFF" when the front door is open. When it is open, the error code "50" is indicated on the "WIN-NER PAID METER" and the normal game does not work. Please note that the "FRONT DOOR KEY SWITCH" also checks to see if the front door is open or not.

® TEST SWITCH

The "TEST SWITCH" is used to place the machine in test modes by pressing the button to correspond with the test mode required. (e.g. TEST PORT NO. 4; press the button 4 times.)

- COIN TEST SWITCH

The "COIN TEST SWITCH" is used to create game credits for testing and only while the front door is open. Each time the "COIN TEST SWITCH" is pressed, game credits increase. However, there is no actual payout while you are testing games. When you close the front door, the game credits made by using this switch are cleared.

COIN SWITCH

The "COIN SWITCH" is using two photo sensors to count the inserted coins to check the time and direction of a coin passing through it.

® VOLUME CONTROLLER

The "VOLUME CONTROLLER" is used to adjust the sound volume which this machine will make.

MAIN POWER SWITCH

The "MAIN POWER SWITCH" is used to switch AC power on or off.

® HOPPER OVERFLOW CONTROL SWITCH:

The "HOPPER OVERFLOW CONTROL SWITCH" is used to select the ways of checking the quantity of coins inside the "HOPPER UNIT" or the "CASH BOX".

CONTROL BY CONDUCTION

The checking terminals inside the "HOPPER UNIT" checks the quantity of coins and control the way of the inserted coins, that is, into the "HOPPER UNIT" or the "CASH BOX".

CONTROL BY PROGRAM

I nstead of conductors, the program itself checks quantity of coins and controls the way of inserted coins, that is, into the "HOPPER UNIT" or into the "CASH BOX". The microprocessor memorizes the quantity of coins and determines the remaining quantity of coins by calculating.

JACKPOT RESET KEY SWITCH/PASSING TIME ADJUSTMENT SWITCH

JACKPOT RESET KEY SWITCH

This key is used to clear the status of "JACK-POT/TILT" in case of the "DOLLAR VER-SION" (Refer to the clause of "AUTOMAT-IC HOPPER PAYOUT" and "JACKPOT RESET".).

PASSING TIME ADJUSTMENT SWITCH

This key is also used to adjust the time limitation for a coin to pass through the "COIN SWITCH". You can adjust the maximum time and the minimum time by turning this switch in counter clock wise and in clock wise respectively. Please note that this adjustment is available only during the "TEST PORT NO. 3" of the "SELF-TEST PROGRAM".

10 METER READING KEY SWITCH

The "METER READING KEY SWITCH" is used to activate the "METER READING PROGRAM" and to select the "METER READING NO.". The game and operation status (such as "TOTAL IN", "TOTAL OUT", "TOTAL PAYOUT %", etc.) can be monitored on the "WINNER PAID METER".

11 CHANGE BUTTON SWITCH

The "CHANGE BUTTON SWITCH" is located on the front door and used when a player needs an attendant's help while playing a machine. When you press the "CHANGE BUTTON SWITCH" for an attendant's help one time, the "TILT" lamp on the tower light is turned on. If you press the "CHANGE BUTTON SWITCH" again, the light. can be turned off.

(12 COINS TO CASH BOX SWITCH

The "COIN TO CASH BOX SWITCH" is using one photo sensor to count the coins being overflowed into the "CASH **BOX"**.

13 DIP SWITCHES

The "DIP SWITCHES" are not shown in Fig. 11 but are located on the "MAIN LOGIC BOARD". These switches are used to select the following functions.

| 1. | | switch is used to select the type of the output signal in case of "LINK GRESSIVE". |
|----|-----------------------------|--|
| | | The machine releases "LEVEL OUTPUT" until the status of "JACK- POT" is reset when a jackpot is won. |
| | | The machine releases "PULSE OUTPUT" only for 10 seconds when a jackpot is won. |
| 2. | DIP SWITCH 2 : This SIVE | switch is used to select the functions of the machine, for "PROGRES-" or for "NON-PROGRESSIVE". |
| | "OFF" | NON-PROGRESSIVE |
| | "ON" | PROGRESSIVE |
| 3. | DIP SWITCH 3 : This | switch is used to select the type of "AUTOMATIC HOPPER PAYOUT". |
| | "OFF" | The machine pays out up to 1,200 coins. |
| | "ON" | The machine pays out up to 650 coins. |

6. ERROR CODE

If malfunctions mentioned below happen, the following error codes are indicated on the "WIN-NER PAID METER". At the same time, the "TILT" lamps on the reel glass and the tower light (except in case of the error code "50") are turned on, the error sound is activated and the game becomes invalid.

| ERROR CODES | TROUBLES |
|-------------|------------------------------|
| 11 | LOW VOLTAGE |
| 12 | BATTERY POLARITY |
| 21 | COIN JAM |
| 31 | COINS OVER-DISPENSED |
| 32 | HOPPER JAM |
| 33 | HOPPER EMPTY |
| 41 | 1ST REEL SPINNING IMPROPERLY |
| 42 | 2ND REEL SPINNING IMPROPERLY |
| 43 | 3RD REEL SPINNING IMPROPERLY |
| 50 | DOOR OPEN |

1) LOW VOLTAGE "11"

If voltage temporarily drops, the error code "11" is indicated on the "WINNER PAID METER", the "TILT" lamps are turned on, the error sound is activated and the game becomes invalid. However, when voltage recovers to the rated minimum, the machine is automatically reset within 2 seconds and the game becomes valid. Please note that the display of the error code "11" still remains on the "WINNER PAID METER" even after the machine is automatically reset. It will be cleared when a next game is played.

2) BATTERY POLARITY "12"

If the voltage of the built-in battery is lower than the rated one when AC power is "ON", the error code "12" is indicated on the "WIN-NER PAID METER", the "TILT" lamps are turned on, the error sound is activated and the game becomes invalid. In such a case, the built-in "RAM" has not memorized the previous status. Therefore, it is necessary to completely clear the "RAM" memory. Press the "ALL CLEAR SWITCH" being located on the "MAIN LOGIC BOARD" and at the same time, switch on AC power. Please note that you have to keep pressing the "ALL CLEAR SWITCH" at least 2 or 3 seconds even after switching on AC power. Through the above procedures, the "TILT" lamps and the error sound can be turned off. Also the error code "12" can be cleared and the game becomes available.

3) COIN JAM "21"

If it takes more or less than the time being fixed for a coin to pass through the "COIN SWITCH", a coin passes the "COIN SWITCH" from down to up, or some coins are jammed at the "COIN SWITCH", the error code "21" is indicated on the "WINNER PAID ME-TER", the "TILT" lamps are turned on and the error sound is activated. The "COIN SWITCH" is using two photo sensors, which not only count the inserted coins but also protect a machine against "STRINGING". Press the "RESET SWITCH" to clear all the above. If coins are jammed around the "COIN SWITCH", remove them before pressing the "RESET SWITCH".

4) COINS BEING OVER-DISPENSED "31"

If the "HOPPER UNIT" pays out more coins than the coins being won or pays out coins except when they are won, the error code "31" and the numbers of coins being overdispensed are indicated on the "WINNER PAID METER", the "TILT" lamps are turned on and the error sound is activated. During this status, the game is invalid. In such a case, press the "RESET SWITCH" to clear the status of the error code -31". Please note that the numbers of coins being over-dispensed are totaled to the "METER READ-I NG NO. 3 (TOTAL OUT)" and the "METER READING NO. 9 (OVER PAID)".

5) HOPPER JAM "32"

If the "HOPPER PAYOUT COUNT SWITCH" is switched on for 2. or 3 seconds by some obstructions like coins being jammed in it, the error code "32" is indicated on the "WIN-NER PAID METER", the "TILT" lamps are turned on and the error sound is activated. If this happens, press the "RESET SWITCH" to clear the status of the error code "32" after removing such obstructions.

6) HOPPER EMPTY "33"

If coins are not paid out within 9 to 10 seconds after the "HOPPER UNIT" starts running, the error code "33" is indicated on the "WINNER PAID METER", the "TILT" lamps are turned on and the error sound is activated. During this status, the game is invalid. This error normally happens when there are no coins in the "HOPPER UNIT". Therefore, refill the "HOPPER UNIT" with coins and press the "RESET SWITCH" to clear the status of the error code "33". Then close the "FRONT DOOR". The "HOPPER UNIT" starts to pay out the balance.

7) 1ST REEL SPINNING IMPROPERLY "41"

In case the 1st reel spins improperly or does

not spin, the error code "41" is indicated on the "WINNER PAID METER", the "TILT" lamps are turned on and the error sound is activated. In such a case, the status at the time when the error happens is maintained until the status of the error code "41" is cleared by pressing the "RESET SWITCH". Please note that the reel spinning sound changes to the error sound 15 seconds after the said error happens, and also that the game being in progress at the time when the said error happens becomes invalid. Press the "RESET SWITCH" to clear the status of the error code "41.

8) 2ND REEL SPINNING IMPROPERLY "42"

In case the 2nd reel spins improperly or does not spin, the error code "42" is indicated on the "WINNER PAID METER", the "TILT" lamps are turned on and the error sound is activated. During this status, the game is invalid. (Please refer to the explanation in 7.)

9) 3RD REEL SPINNING IMPROPERLY "43"

In case the 3rd reel spins improperly or does not spin, the error code "43" is indicated on the "WINNER PAID METER", the "TILT" lamps are turned on and the error sound is activated. During this status, the game is invalid. (Please refer to the explanation in 7.)

10) DOOR OPEN "50"

In case the front door is open, the error code "50" is indicated on the "WINNER PAID METER", the "DOOR OPEN" lamp (yellow color) on the tower light unit is turned on and the error sound is activated every 2 minutes. During this status, the game is invalid but can be tested by using the "COIN TEST SWITCH". The "DOOR OPEN" lamp and the error sound can be turned off by closing anc locking the front door. However, the error code "50" still remains on the "WINNEF PAID METER" even after the front door it closed and locked and can be cleared onh

when a next game is played. Please note that the insertion of coins during this error is the same as using the "COIN TEST SWITCH" and is not added to the "TOTAL IN COUNTER". Also there is no actual payout even though you win. Note: The "SELF-TEST PROGRAM" will not work even though the above errors are cleared, unless the game is completely over.

7. SELF-TEST PROGRAM

Upon opening the front door, the "TEST SWITCH" will be found nn the right side of the cabinet. Any of the following mentioned eight tests can be selected according to the times the "TEST SWITCH" is pressed. The "TEST PORT NO." is indicated nn the most right of the "WIN-NER PAID METER", so simply press the "TEST SWITCH" until you get the desired test. If you press the "TEST SWITCH" again after the "TEST PORT NO. 8", it returns to the "TEST PORT NO. 1". Once you select one of the following tests, it will be fixed 1 or 2 seconds after you stop pressing the "TEST SWITCH" and then the indication of the fixed "TEST PORT NO." moves from the right to the most left of the "W I N N E R PAID METER". Now, the test is ready. Please note that, even after a selected test is fixed, it is cancelled if the "TEST SWITCH" is pressed again. In such a case, the test port returns the "TEST PORT NO. 1". When you want to cancel the "SELF-TEST PROGRAM" after testing, just press the "RESET SWITCH". In case of testing the "TEST PORT NO. 2, 5, 7 or 8", to close the front door will automatically cancel the "SELF-TEST PROGRAM".

Note: The "SELF-TEST PROGRAM" works only when the front door is open and the error code "50" is indicated nn the "WIN-NER PAID METER". It does not work when a jackpot has been won or a game is in process.

1) SYMBOL DETECTION TEST "TEST PORT NO. 1"

After this test port is fixed and the front door is closed, the number "1" is indicated nn the "COINS PLAYED METER" which means you have one playing credit to start the reels. In this test port, it is tested if each symbol nn the reels is correctly detected or not, and the code numbers of symbols nn the center win line are indicated nn the "WINNER PAID METER" when the reels stop spinning. Pull the handle lever to test it, referring to Appendix A. During this test port, the test can be repeated as many times as desired, unless this test port is cancelled by pressing the "RESET SWITCH".



Note: In case a reel spins improperly, the symbols will not registered and the code "0" is indicated together with the error code.

2) REEL SET TEST "TEST PORT NO. 2"

This test port determines whether each ref stops nn the center win line in order c "STOP POSITION" and whether the ref strips correspond to the program. There at 22 stops nn each reel and each reel symbol has its own "SYMBOL CODE NO." as mer tinned in the "TEST PORT NO. 1". Whe you test this test port, each reel automaticall starts and stops spinning in order **of** T POSITION". When each reel stops spinning

the "SYMBOL CODE NO." is indicated c the "WINNER PAID METER". Please nn⁻

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that this test repeats same unless cancelled by closing and locking the front door or pressing the "RESET SWITCH".

Note: The "STOP POSITION NO." is from "21" to "0".

| WHEN "TEST PORT NO. 2" IS SELECTED. | | |
|---|--|--|
| 2 | | |
| TEST PORT NO. | | |
| WHEN THE SELECTED "TEST PORT NO. 2" IS FIXED | | |
| 2 | | |
| TEST PORT NO. | | |
| WHEN THE REELS STOP SPINNING (IN CASE OF STOP POSITION NO. "21") | | |
| 2 1 1 1 | | |
| "7 BAR" ON 3RD REEL "7 BAR" ON 2ND REEL "7 BAR" ON 1ST REEL TEST PORT NO. | | |
| WHEN THE REELS STOP SPINNING (IN CASE OF STOP POSITION NO. "20") | | |
| 2 4 4 4 | | |
| "BLANK" ON 3RD REEL "BLANK" ON 2ND REEL "BLANK" ON 1ST REEL "BLANK" ON 1ST REEL TEST PORT NO. | | |
| WHEN THE REELS STOP SPINNING (IN CASE OF STOP POSITION NO. "19") | | |
| 2 3 3 3 "1 BAR" ON 3RD REEL "1 BAR" ON 2ND REEL "1 BAR" ON 1ST REEL TEST PORT NO. | | |



Note: When the above mentioned test goes to the "STOP POSITION NO. 0", it starts the same from the "STOP POSI-TION NO. 21" repeatedly unless cancelled.

3) COIN SWITCH TEST "TEST PORT NO. 3"

After this test is fixed, close the front door. In this test, the time when it takes for a coin to pass through the "COIN SWITCH" is measured and is indicated on the "WINNER PAID METER". Please note that the indication is done in a milli-second unit.



Note: If it takes over 1 second for a coin to pass through the "COIN SWITCH" even while testing, the error code "21" will be indicated on the "WIN-NER PAID METER". Please never forget to push the "RESET SWITCH" after this test port is finished.

ADJUSTMENT OF TIME LIMITATION FOR THE PASSING OF A COIN

Also during this test port, a time limitation adjustment can be made for the passing of a coin by the following procedures.

a) THE MAXIMUM TIME FOR A COIN TO PASS:

The maximum time for a coin to pass is adjustable from 60 to 500 milli-seconds. Turn the "PASSING TIME ADJUST-MENT SWITCH" in counter clock wise. One turn is 20 milli-seconds. The adjusted time for a coin to pass is indicated on the most right of the "WINNER PAID ME-TER".

b) THE MINIMUM TIME FOR A COIN TO PASS:

The minimum time for a coin to pass is adjustable from 0 to 50 milli-seconds. Turn the "PASSING TIME ADJUST-MENT SWITCH" in clock wise. The adjusted time for a coin to pass is indicated on the "COINS PLAYED METER".

When you complete the above mentioned adj ustments, fix them by inserting a coin or cancelling this test port.

Note: The time it takes for a coin to pass is automatically adjusted at the normal time limitation, minimum of 0 millisecond and maximum of 2,000 milliseconds, unless it is manually adjusted.

EXAMPLE: INDICATION OF TIME LIMITATION.

WINNER PAID METER



- * The number "10" on the "WINNER PAID METER" is the maximum time for a coin to pass.
- * The number "3" on the "WINNER PAID METER" is the "TEST PORT NO.".
- * The number "2" on the "COINS PLAYED METER" is the minimum time for a coin to pass.

INDICATION ON THE "COINS PLAYED METER" (MINIMUM TIME)

- 0 milli-second = 0
- 10 milli-seconds = 1
- 20 milli-seconds = 2 30 milli-seconds = 3
- 30 milli-seconds = 340 milli-seconds = 4
- 50 milli-seconds = 5

INDICATION ON THE "WINNER PAID METER" (MAXIMUM TIME)

| 60 milli-seconds = 6 | 300 milli-seconds = 30 |
|------------------------|-------------------------|
| 80 milli-seconds = 8 | 320 milli-seconds = 32 |
| 100 milli-seconds = 10 | 340 milli-seconds = 34 |
| 120 milli-seconds = 12 | 360 milli-seconds = 36 |
| 140 milli-seconds = 14 | 380 milli-seconds = 38 |
| 160 milli-seconds = 16 | 400 milli-seconds = 40 |
| 180 milli-seconds = 18 | 420 milli-seconds = 42 |
| 200 milli-seconds = 20 | 440 milli-seconds = 44 |
| 220 milli-seconds = 22 | 460 milli-seconds = 46 |
| 240 milli-seconds = 24 | 480 milli-seconds = 48 |
| 260 milli-seconds = 26 | 500 milli-seconds = 50 |
| 280 milli-seconds = 28 | |

4) HOPPER TEST "TEST PORT NO. 4"

This test port determines if the "HOPPER UNIT" is working correctly or not. The "HOPPER UNIT" automatically pays out 10 coins 2 seconds after this test port is fixed, and the number of those paid-out coins (10) is indicated on the most right of the "WIN-NER PAID METER". If there is an error when coins are paid out, the error code is indicated on the "WINNER PAID METER". Please note that those paid-out coins are not counted into the "TOTAL OUT COUNTER". However, those coins which are paid out during this test port are counted in the "ME-TER READING PROGRAM". Therefore, if you want to know how many coins are paid out during this test port, please determine the same from the "METER READING NO. 9" of the "METER READING PROGRAM".



5) OUT-PORT TEST "TEST PORT NO. 5"

This test port determines if each port pertaining to the "OUT-PORT" works correctly or not. After this test port is fixed, the numbers "888888", "8" and "8" are indicated on the "WINNER PAID METER", the "LAST GAME COINS PLAYED METER" and the "COINS PLAYED METER" respectively. This is a test for the "L.E.D.". After that test, the out-port being indicated its code number is automatically demonstrated. The test for each port automatically advances every 2 seconds, according to the following order. EXAMPLE: |N CASE OF MODEL NO. 8502-8506 & 8508 DOUBLE UP SERIES

| OUBLE UP | SERIES |
|----------|---|
| CODE NO. | PORT |
| 30 | * * * NOT USED * * * |
| 31 | * * * NOT USED * * * |
| 32 | 2ND COIN LAMP |
| 33 | 1ST COIN LAMP |
| 40 | * * * NOT USED * * * |
| 80 | COINS TO CASH BOX |
| | ELECTROMAGNETIC COUNTER |
| 81 | TOTAL OUT ELECTRO- |
| | MAGNETIC COUNTER |
| 82 | TILT LAMP OF REEL GLASS AREA |
| 83 | CALL ATTENDANT LAMP OF REEL GLASS AREA |
| 84 | * * * NOT USED * * * |
| 85 | * * * NOT USED * * * |
| 86 | COIN ACCEPTED & PULL |
| | HANDLE LAMP |
| 87 | INSERT COIN LAMP |
| 95 | JACKPOT LAMP OF TOWER LIGHT UNIT |
| 96 | TILT LAMP OF TOWER LIGHT UNIT |
| 97 | DOOR OPEN LAMP OF TOWER |
| 126 | HOPPER SOLENOID |
| 127 | HOPPER MOTOR |
| 137 | HANDLE UNLOCK COIL |
| 144 | COIN LOCKOUT COIL |
| 145 | JACKPOT LAMP OF REEL |
| | GLASS AREA |
| 146 | JACKPOT BALANCE |
| | ELECTROMAGNETIC COUNTER |
| 147 | TOTAL IN ELECTROMAGNETIC COUNTER |
| 157 | DIVERT SOLENOID |
| 101 | COIN IN SOUND |
| 111 | COIN IN SOUND OFF |
| 102 | REEL START SOUND |
| 112 | REEL START SOUND OFF |
| 103 | REEL STOP SOUND |
| 113 | REEL STOP SOUND OFF |
| 104 | REEL SPINNING SOUND |
| 114 | REEL SPINNING SOUND OFF |
| 105 | PAYOUT SOUND |
| 115 | DITTO. |
| | |

| | ····· |
|----------|----------------------|
| CODE NO. | PORT |
| 106 | DITTO. |
| 116 | DITTO. |
| 107 | DITTO. |
| 117 | DITTO. |
| 108 | DITTO. |
| 118 | DITTO. |
| 109 | DITTO. |
| 119 | DITTO. |
| 200 | DITTO. |
| 210 | DITTO. |
| 201 | DITTO. |
| 211 | DITTO. |
| 202 | DITTO. |
| 212 | DITTO. |
| 203 | DITTO. |
| 213 | DITTO. |
| 204 | DITTO. |
| 214 | DITTO. |
| 205 | PAYOUT SOUND |
| 215 | DITTO. |
| 206 | DITTO. |
| 216 | DITTO. |
| 207 | DITTO. |
| 217 | DITTO. |
| 208 | * * * NOT USED * * * |
| 218 | * * * NOT USED * * * |
| 209 | ERROR SOUND |
| 219 | ERROR SOUND OFF |
| 400 | JACKPOT SOUND |
| 410 | JACKPOT SOUND OFF |
| 401 | * * * NOT USED * * * |
| 411 | * * * NOT USED * * * |

Unless the "SELF-TEST PROGRAM" is cancelled or the "TEST PORT" is changed, the aforesaid test is automatically repeated.

- **Note:** The code numbers are changed according to the model.
- Note: Electromagnetic counters themselves such as the "COINS TO CASH BOX COUNTER", the "TOTAL OUT COUNTER", "JACKPOT BALANCE COUNTER" and the "TOTAL IN COUNTER" are not increased during this test.

6) IN-PORT TEST "TEST PORT NO. 6"

This test port determines if each switch pertaining to "IN-PORT" works correctly or not. Differing from the "TEST PORT NO. 5", each switch is tested when it is manually switched on or off. Simply choose which test you want. When a switch is switched on or off, its code number is indicated on the "WINNER PAID METER".

| PORT |
|--|
| DOOR SWITCH |
| HOPPER OVERFLOW SWITCH IN CASE OF "CONTROL BY CONDUCTION" |
| COIN TEST SWITCH |
| DOOR LOCK KEY SWITCH |
| CHANGE BUTTON SWITCH |
| * * * NOT USED * * * |
| COINS TO CASH BOX SWITCH (PHOTO SENSOR) |
| COIN SWITCH (UPPER PHOTO SENSOR) |
| 1ST REEL PHOTO SENSOR |
| 2ND REEL PHOTO SENSOR |
| 3RD REEL PHOTO SENSOR |
| PASSING TIME ADJUSTMENT SWITCH FOR MINIMUM TIME |
| ALL CLEAR SWITCH ON MAIN LOGIC BOARD |
| COIN SWITCH (LOWER PHOTO SENSOR) |
| HOPPER COUNT SWITCH |
| RESET SWITCH |
| TEST SWITCH |
| METER READING KEY SWITCH |
| PASSING TIME ADJUSTMENT SWITCH FOR MAXIMUM TIME & JACKPOT RESET KEY SWITCH |
| HANDLE RETURN SWITCH (PHOTO SENSOR) |
| HANDLE UNLOCK SWITCH (PHOTO SENSOR) |
| REEL MOTOR START SWITCH (PHOTO SENSOR) |
| PROGRESSIVE JACKPOT RESET SWITCH (OPTIONAL) |
| HOPPER OVERFLOW CONTROL SWITCH |
| |

Note: The "RESET SWITCH" test will not work because it cancels "SELF-TEST PROGRAM". Also the "TEST SWITCH" test will not work because it cancels this test port and will return the test port to its initial port.

7) OUT-PORT TEST (MANUAL) "TEST PORT NO. 7"

This test port is same as the aforesaid "TEST PORT NO. 5" but the test of each out-port must be done manually. At first, select "TEST PORT NO." by pressing the "TEST SWITCH" seven times. Then press the "COIN TEST SWITCH" to select the desired outport. One press gives one step-up of the outport. When you complete the selection, press the "DOOR SWITCH". Then the selected outport can be demonstrated only while the "DOOR SWITCH" being pressed.

| | and the second |
|----------|--|
| CODE NO. | PORT |
| 30 | * * * NOT USED * * * |
| 31 | * * * NOT USED * * * |
| 32 | 2ND COIN LAMP |
| 33 | 1ST COIN LAMP |
| 40 | * * * NOT USED * * * |
| 80 | COINS TO CASH BOX ELECTROMAGNETIC COUNTER |
| 81 | TOTAL OUT ELECTRO- MAGNETIC COUNTER |
| 82 | TILT LAMP OF REEL GLASS AREA |
| 83 | CALL ATTENDANT LAMP OF REEL GLASS AREA |
| 84 | * * * NOT USED * * * |
| 85 | * * * NOT USED * * * |
| 86 | COIN ACCEPTED & PULL HANDLE LAMP |
| 87 | INSERT COIN LAMP |
| 95 | JACKPOT LAMP OF TOWER LIGHT UNIT |
| 96 | TILT LAMP OF TOWER LIGHT UNIT |
| 97 | DOOR OPEN LAMP OF TOWER LIGHT UNIT |
| | |

| | ······································ |
|----------|--|
| CODE NO. | PORT |
| 126 | HOPPER SOLENOID |
| 137 | HANDLE UNLOCK COIL |
| 144 | COIN LOCK-OUT COIL |
| 145 | JACKPOT LAMP OF REEL GLASS AREA |
| 146 | JACKPOT BALANCE ELECTROMAGNETIC COUNTER |
| 147 | TOTAL IN ELECTROMAGNETIC COUNTER |
| 157 | DIVERT SOLENOID |
| 101 | COIN IN SOUND |
| 102 | REEL START SOUND |
| 103 | REEL STOP SOUND |
| 104 | REEL SPINNING SOUND |
| 105 | PAYOUT SOUND |
| 106 | DITTO. |
| 107 | PAYOUT SOUND |
| 108 | DITTO. |
| 109 | DITTO. |
| 200 | DITTO. |
| 201 | DITTO. |
| 202 | DITTO. |
| 203 | DITTO. |
| 204 | DITTO. |
| 205 | DITTO. |
| 206 | DITTO. |
| 207 | DITTO. |
| 208 | * * * NOT USED * * * |
| 209 | ERROR SOUND |
| 400 | JACKPOT SOUND |
| 401 | * * * NOT USED * * * |
| | |

Note: Electromagnetic counters are increased during this test.

8) PAYOUT COMBINATION TEST "TEST PORT NO. 8"

This test port automatically demonstrates each winning combination which stops on the center win line and indicates the payout on the "WINNER PAID METER", the "SYMBOL CODE NO." on the "LAST GAME COINS PLAYED METER" and the numbers of coins being bet on the "COINS PLAYED METER".

Example: Indication of winning combinations in case of Model No. 8504.

> When this test port is fixed, each winning combination is automatically demonstrated one by one in the following order.

| WINNING COMBINATION | SYMBOL CODE NO. | | PAY- OUT |
|------------------------|-----------------------|---|-------------|
| 7 BAR – 7 BAR – 7 BAR | 1 | 2 | 500 |
| 7 BAR – 7 BAR – 7 BAR | 1 | 1 | 200 |
| 5 BAR – 5 BAR – 5 BAR | 2 | 1 | 50 |
| 1 BAR – 1 BAR – 1 BAR | 3 | 1 | 10 |
| BLANK – BLANK – BLANK | 4 | 1 | 1 |

WINNER PAID METER

| · | | | | | | |
|--|---|----------|---------|---------|-------------|--|
| | | | 5 | 0 | 0 | |
| | | | | | | |
| 1 | | | | | 2 | |
| LAST | GAME | | | COINS | PLAYED | |
| COIN MET | | | | METER | | |
| | in | | | | | |
| *** - | he "SYM | | | O ′′ is | indicated | |
| | n the "L | | | | | |
| - | | A31 U | | | | |
| *** The number of coins being bet is indi- | | | | | | |
| cated on the "COINS PLAYED METER". | | | | | | |
| *** The payout of the winning combination | | | | | | |
| | indicate | | | - | | |
| N | IETER". | | | | | |
| *** V | /hen the | demons | tration | ofa | 500 coin | |
| jackpot win is completed, the demonstra- | | | | | | |
| t | tion of a 200 coin jackpot win, a 50 coin | | | | | |
| v | /in, a 10 c | coin wir | ı, | etc. w | ill be fol- | |
| lo | owed. | | | | | |

Note: The winning combination and its payout are changed according to models. (See Appendix B).

8. METER READING

A. METER READING ON PROGRAM

Universal's slot machine contains the "METER READING PROGRAM" which shows "TOTAL GAMES", "TOTAL IN", "TOTAL OUT", "TOTAL PAYOUT %", etc. on the "WINNER PAID METER" and the "METER READING NO." on the "COINS PLAYED METER" as follows.

When you want to see the data memorized in the "METER READING PROGRAM", turn the

"METER READING KEY SWITCH" in counter clock wise. The "METER READING NO." and the data will be indicated on the above said meters. Please note that the "METER READING NO." and the selected data can be indicated on those meters only while the "METER READING KEY SWITCH" is at the counter clock wise position. One counter clock wise turn gives one change.

| METER READING NO. | CONTROL OF DATA | | |
|----------------------|----------------------------|---|--|
| 1 | TOTAL GAMES | = | times of games played. |
| 2 | TOTAL IN | = | numbers of coins inserted. |
| 3 | TOTAL OUT | = | numbers of coins paid-out. |
| 4 | TOTAL PAYOUT % | = | percentage of "TOTAL IN" and "TOTAL OUT". |
| ¥ [°] 5 | HOPPER PAYOUT | = | numbers of coins paid-out only from "HOPPER UNIT". |
| 6 | JACKPOT BALANCE | = | * Always indicating "0" if all of won coins paid-out from "HOPPER UNIT" automatically. |
| 7 | COINS TO CASH BOX | = | numbers of coins overflowed into "CASH BOX". |
| 8 | DOOR OPENINGS | = | times of front door opened. |
| 9 | PAYOUT OF HOPPER TEST | = | numbers of coins paid-out while hopper tested. |
| 10 | COINS BEING OVER-DISPENSED | = | numbers of coins over-dispensed. |
| 11 | 1ST REEL ERROR | = | times of 1st reel error. |
| 12 | 2ND REEL ERROR | = | times of 2nd reel error. |
| 13 | 3RD REEL ERROR | = | times of 3rd reel error. |
| 14 | HOPPER JAM | = | times of hopper jammed. |
| 15 | COIN JAM | = | times of coins jammed. |

Example: Indication of "METER READING NO." and its data.



Note: In case of the "METER READING NO. 3 or 4", the indication of "METER READING NO." and its data is as follows.

B. METER READING ON ELECTROMAGNETIC COUNTERS

Besides the aforesaid "METER READING PRO-GRAM" being visible on the "WINNER PAID METER", Universal's slot machine is equipped with non-resettable electromagnetic counters inside the cabinet as follows.

- (1) TOTAL IN COUNTER: Number of coins inserted.
- (2) COINS TO CASH BOX COUNTER: Number of coins overflowed into "CASH BOX".
- (3) TOTAL OUT COUNTER: Number of coins paid-out.
- IACKPOT BALANCE COUNTER
 * Always indicating "0" if all of won coins paid out from "HOPPER UNIT" automatically.
- Note: Concerning the "JACKPOT BALANCE" of both "METER READING PRO-GRAM" and the "ELECTROMAGNETIC COUNTER", there are two cases of being used and being not used. It depends on models whether the "JACKPOT BAL-ANCE" is used or not. In case the machine does not pay out all of won coins from its "HOPPER UNIT" upon jackpot and the balance is paid by an attendant, the "JACKPOT BALANCE" is used, that is, such balance is counted into the "JACKPOT BALANCE" when the jackpot is reset. But in case the machine pays out all of won coins upon jackpot, it is not used, that is, there is always no balance.





9. AUTOMATIC HOPPER PAYOUT ON JACKPOT WIN

The "AUTOMATIC HOPPER PAYOUT" means how many coins Universal's slot machine automatically pays out from its "HOPPER UNIT" when a jackpot is won and, depending on the size of coins being used, is different between the slot machine for U.S. \$1.00 coin use ("DOLLAR VERSION") and the one for U.S. 25Ccoin use ("QUARTER VERSION"). Universal's "HOPPER UNIT" can contain approximately 800 pieces of U.S. \$1.00 coins or approximately 2,500 pieces of U.S. 250coins at its "HOPPER OVERFLOW LEVEL". Therefore, Universal's slot machine has been programmed to change the payable quantity of the "AUTOMATIC HOPPER PAY-OUT" by using the "DIP SWITCH", that is, to pay out up to 650 coins in case of the "DOLLAR VERSION" and up to 1,200 coins in case of the

"QUARTER VERSION" when a jackpot is won. If the jackpot is same or less than the payable quantity of the "AUTOMATIC HOPPER PAY-OUT", all of such a jackpot win is automatically paid out from its "HOPPER UNIT" and the game becomes available again after the payout of such a jackpot win is completed. However, if it is bigger, such a jackpot win is paid out within the payable quantity of the "AUTOMATIC HOPPER PAYOUT" from the "HOPPER UNIT" and the balance must be paid by an attendant. In this case; Universal's slot machine is shifted to the status of "JACKPOT/TI LT" and the game is not available until the attendant clears such a status by using the "JACKPOT RESET KEY SWITCH". Refer to the clause of "JACKPOT RESET")

10. JACKPOT RESET

In case of Model No. 8470 in the "DOLLAR VERSION", the machine automatically pays out all of a 200 coin jackpot win or a 500 coin jackpot win from its "HOPPER UNIT" but does not pay out all of a 1,000 coin jackpot win as the "AUTOMATIC HOPPER PAYOUT" is only 650 coins.

In case of the same model in the "QUARTER VERSION", the machine automatically pays out all of a 200 coin jackpot win, a 500 coin jackpot win or a 1,000 coin jackpot win as the "AUTO-MATIC HOPPER PAYOUT" is 1,200 coins.

In case of the "DOLLAR VERSION", that is, the machine does not pay out all of a 1,000 coin jack-

pot win, the machine is shifted to the status of "JACKPOT/TI LT" and is locked out immediately after the payable quantity (650 coins) of the "AUTOMATIC HOPPER PAYOUT" is paid out from its "HOPPER UNIT". The attendant must pay the balance (350 coins), which is not paid out yet, and must clear the status of "JACKPOT/ TILT" by using the "JACKPOT RESET KEY SWITCH". When the "JACKPOT RESET KEY SWITCH" is turned in counter clock wise, the "TILT" sound and the "TILT" lamps are turned off and the "JACKPOT" lamps are also turned off after the coins being paid by the attendant are added to the "JACKPOT BALANCE COUNTER" as well as the "TOTAL OUT COUNTER". Then the game becomes available again.

11. HOPPER OVERFLOW CONTROL

Inserted coins are dropped into the "HOPPER UNIT" or the "CASH BOX" in two ways. One is by "CONTROL BY CONDUCTION" and the other is by "CONTROL BY PROGRAM".

(1) CONTROL BY CONDUCTION

The "CONTROL BY CONDUCTION" uses the conductivity of metals, and determines if the inserted coins should be dropped into either the "HOPPER UNIT" or the "CASH BOX" by conduction between the checking terminals. Please note that the "OVER-FLOW LEVEL" is a line between the checking terminals - i.e. inserted coins act as conductors between the checking terminals.

In case coins do not exceed the "OVER-FLOW LEVEL", that is, the microprocessor does not detect any conduction between the checking terminals, the inserted coins are dropped into the "HOPPER UNIT".

- Note: The "OVERFLOW LEVEL" can be adjusted by changing the position of the checking terminals. The above checking mentioned terminals include "POSITIVE CHECKING TERMINALS" and "NEGATIVE CHECKING TERMINALS". The former are installed inside the "HOP-PER UNIT" such as the "BOWL END PLATE", the "HOPPER COVER", etc., which lead to "GROUND".
- (2) CONTROL BY PROGRAM

The "CONTROL BY PROGRAM" deter-

mines whether the inserted coins should be dropped into either the "HOPPER UNIT" or the "CASH BOX" per the microprocessor calculation, instead of such exterior means as checking terminals or floating balls. The microprocessor memorizes a certain fixed quantity of coins and checks the remaining quantity of coins by calculating inserted/ paid-out coins.

HOW TO CHANGE FROM "CONTROL BY CONDUCTION" TO "CONTROL BY PROGRAM"

First, put 650 coins for example (the fixed quantity), into the empty "HOPPER UNIT". Please note that 650 coins have been programmed as "LEVEL ZERO". Then change the "HOPPER OVERFLOW CONTROL SWITCH" to the "CON-TROL BY CONDUCTION". When the "HOPPER OVERFLOW CONTROL SWITCH" is switched to the "CONTROL BY CONDUCTION", the microprocessor clears the previous status of the remaining coins and starts the calculation from "LEVEL ZERO". After switching to the "CON-TROL BY CONDUCTION", switch to the "CON-TROL BY PROGRAM". Now, "CONTROL BY PROGRAM" will work.

In case the remaining coins exceed 750 coins which are "LEVEL ZERO" + 100 coins after calculation, inserted coins are overflowed into the "CASH BOX".

In case the remaining coins do not exceed 650 after calculation, inserted coins are dropped into the "HOPPER UNIT".

| TYPE | DENOMINATION | CAPACITY | SPEED OF PAYOUT |
|----------|--------------|----------|-----------------|
| В | 50 | 3,800 | 11 COINS/SECOND |
| В | 250 | 2,500 | 8 COINS/SECOND |
| В | 500 | 1,400 | 5 COINS/SECOND |
| В | \$1 | 800 | 4 COINS/SECOND |
| C (1986) | 50 | 3,000 | 25 COINS/SECOND |
| C (1986) | 250 | 2,000 | 20 COINS/SECOND |
| C (1986) | 500 | 1,200 | 15 COINS/SECOND |
| C (1986) | \$1 | 600 | 10 COINS/SECOND |

HOPPER CAPACITY AND SPEED OF PAYOUT

12. TOWER LIGHT UNIT

The "TOWER LIGHT UNIT" is available for all of Universal's slot machines. Universal's "TOWER LIGHT UNIT" has three color separations, that is, the red color lamp on top, the green color lamp on middle and the yellow color lamp on bottom, and each color has its own functions as follows:

1) RED COLOR LAMP

This red color lamp is for "JACKPOT", which is activated when a jackpot is hit and is reset by turning on the "JACKPOT RE-SET KEY SWITCH".

2) GREEN COLOR LAMP

This green color lamp is for "TILT" and corresponds to the "TILT" lamp on the reel glass, which is activated when an error happens or when the payout of coins exceeds the payable quantity of "AUTOMATIC HOP-PER PAYOUT". In case of an error happening, it can be turned off when the machine is reset by pressing the "RESET SWITCH" and in case of the payout exceeding the payable quantity of "AUTOMATIC HOPPER PAY-OUT", it can be turned off when the machine is reset by turning the "JACKPOT RESET KEY SWITCH". Also, this green color lamp is for "CHANGE" and is turned on when the "CHANGE BUTTON" is pressed, excepting while the front door is open. In this case, the lamp does not correspond to the "TILT" lamp on the reel glass. This button is used when a player needs an attendant's help while playing the machine. If you want to turn it off, press the button once again.

3) YELLOW COLOR LAMP

This yellow color lamp is for "DOOR OPEN" and corresponds to the error code "50", which is activated only while the front door is opened. It can be turned off only if the front door is closed.



13. TROUBLE SHOOTING



Coin Chute Blockage Fault Finding List

| Inserted coin returned | Coin selector is dirty, or not adjusted correctly. Coin lockout coil not in position. Improper coin lockout coil contact. |
|--|---|
| Inserted coin not credited | Coins are jammed inside coin selector. Coin selector not mounted on holder. |
| • Error 21 is displayed | Check for coin or foreign object jamming around coin switch. Check for dirty coin switch photo sensor. Confirm coin switch operation by conducting Test 6. Measure coin passing time by conducting Test 3. (If it is longer than the set passing time, check coin selector.) |
| Inserted coin doesn't enter hopper | Hopper overflow switch in "ON" or in program control made. Check divert solenoid. |
| More than maximum bet coins are accepted | Coins are jammed inside coin selector. Coins are jammed between coin lockout coil and selector. Check coin lockout coil. |

Handle Blockage Fault Finding List

| Handle can't be pulled although pull handle lamp is "ON" | Handle unlock switch is not in position. Check handle unlock switch and handle return switch. (can be checked by conducting Test 6) Check handle unlock coil. (can be checked by conducting Test 5) |
|--|---|
| Reel won't rotate even when handle is pulled | Check angle-shaped lever and angle-shaped lever spring on handle. |
| | Check motor start switch, handle unlock switch and handle return switch. (can be checked by Test 6) |

Reel Blockage Fault Finding List



Hopper Blockage Fault Finding List




Other Outports Fault Finding List

| Lamp doesn't light up | Check if fuse (for 24V) has blown. Improper lamp socket contact. Check if lamp has burnt out. |
|---|--|
| 7 seg. displayed numerals are abnormal | Check if error code test meter reading is displayed. Check 7 seg. PCB. (Check if 8 is displayed for everything when conducting Test 5) Check PCB to see if it contacts properly. Check if connector contact is proper. |
| No sound (occurs) activates | Adjust sound control knob. Check fuse for sound circuit. Make sure sound has DC12V. Check power source PCB regulator. Check speaker. |
| Electromagnetic counter doesn't actuate | Check for performance by conducting Test 7. Check counter. |

Note: If, after conducting the corresponding tests and following through on all the check lists, malfunctions still cannot be corrected, replace the main PCB. Additionally, if the error code "12" is displayed again even after "ALL CLEAR" has been applied, the RAM does not work correctly. Therefore, the "MAIN P.C.B." should be replaced in such a case too.

14. SECURITY

The Universal slot machine uses a very complex and elaborate random number generator ("RNG") to determine game results. There is nothing similar in use today and is designed to eliminate any person from influencing game results.

We are sure you will agree, that given unlimited resources of money and time, no machine is safe. In that regard, the other forms of security that only Universal slot machines can give you.

- In addition to the complex "RNG", the software is randomly spread over three different E-PROMs.
- 2. All logic, including hopper drive logic, is located on a single "MAIN LOGIC BOARD".
- The "MAIN LOGIC BOARD" is completely enclosed in a heavy gauge steel R.F. cage, which eliminates any access to the "MAIN LOGIC BOARD".
- 4. The R.F. cage is fastened closed with eight (8) sheet metal fasteners.
- The caged "MAIN LOGIC BOARD" plugs into an edge connector in the rear corner of the cabinet. This connector is also enclosed in a steel housing which pre-empts any access to data uses.
- The cage containing the "MAIN LOGIC BOARD" is affixed with a security seal. Any attempt to remove the board, will break the sea 1.

- 7. Any attempt to open the cage without removing it from the game, would require the removal of the "HOPPER UNIT".
- The front door is equipped with two door open switches which are monitored by the "MAIN LOGIC BOARD". These switches activate the door open alarm and the door open light, and record the door openings in software.

The Universal slot machine is engineered and constructed with security as a major concern. With research and development as our major competitive advantage, we can assure all of our customers that we will continue ongoing research toward security.

15. WARRANTY

Universal Distributing of Nevada Inc. shall warrant for the first two (2) months following installation and shall provide remedial (including replacement of defective parts) and servicing the equipment other than routine maintenance by the casino.

Universal Distributing of Nevada Inc. shall not be liable for prospective profits or incidental or consequential damages, but shall restore the equipment to good operating condition. No other warranty is given and no guarantee is made as to equipment held for any given period. This warranty excludes the following:

Light bulbs, fuses, fluorescent starters, ballasts and glass, routine clearing of coin jams, acceptor adjustment, as well as routine preventive maintenance.

This warranty includes the following:

Main logic board, reel assembly, all optics, motors, switches, power supply, handle assembly, wiring harness and connectors, all meters and electronic displays, as well as complete hopper assembly (except knife).

Universal Distributing of Nevada Inc. will also train employees of the casino to repair the machine at no charge.

16. SPARE PARTS

| DESCRIPTION | UNIT PRICE |
|---|----------------|
| Main Logic Board Assembly (Including metal cage) | US\$ 1,500.00 |
| Power Supply Assembly (Including all hardware) | US\$ 500.00 |
| Reel Assembly (Complete) | US\$ 750.00 |
| Hopper Assembly | US\$ 750.00 |
| Miniature Lamp | US\$ 0.50 |
| Fluorescent Bulb | US\$ 4.00 |
| Fluorescent Starter | US\$ 2.00 |
| Handle Assembly | US\$ 800.00 |
| Handle Solenoid | US\$ 20.00 |
| Coin Photo Sensor | US\$ 20.00 |
| Handle Photo Sensor | US\$ 15.00 |
| Reel Photo Sensor | US\$ 15.00 |
| Diverter Assembly | US\$ 40.00 |
| 7 Segment L.E.D. P.C. Board | US\$ 60.00 |
| Assorted Springs for Handle Assembly | US\$ 10.00/set |
| Door Switch | US\$ 3.00 |
| Micro Switch for Hopper Unit | US\$ 8.00 |
| Coin Runner | US\$ 10.00 |

Block Diagram



Main PCB IC Location and Parts List



| Item | Q'ty | Description | Location No. | Parts No. |
|------------|------|----------------------------------|---|------------|
| 74LS 00 | 1 | TTL | 2J | E31200 |
| 7400 | 1 | | 2D | E31200 |
| 74LS 02 | 2 | ** | 4E, 3H | E31202 |
| 74LS 04 | 3 | | 1F, 4F, 1G | E31204 |
| 7406 | 4 | ., | 9D, 9E, 8H, 8L | E31106 |
| 74LS 08 | 5 | " | 6C, 6D, 2E, 5F, 2H | E31208 |
| 74LS 14 | 1 | | 7C | E31214 |
| 74LS 32 | 3 | ** | 1D, 4G, 2K | E31232 |
| 74LS 74 | 2 | " | 3E, 3J | E31274 |
| 74LS139 | 2 | " | 2C, 2L | E312139 |
| 74LS174 | 1 | | 5E | E312174 |
| 74LS253 | 4 | " | 6A, 7A, 6B, 7B | E312253 |
| 74LS257 | 2 | | 5H, 5K | E312257 |
| 74LS259 | 12 | ,, | 6F, 7F, 6H, 7H, 6J, 7J, 6K, 7K, 6L, 7L, 6M, 7M | E312259 |
| 74LS393 | 2 | " | 2F, 3F | E312393 |
| N82S123N | 1 | TTL P-ROM | 5D | E34463311 |
| NE555 | 1 | Timer | 2G | E331555 |
| NE556 | 1 | | 3G | E331556 |
| Z-80A | 2 | Nch MOS CPU | 5A, 5L | E350080A |
| 2732-35 | 4 | Nch MOS 32K bits EP-ROM | 2A, 3A, 4A, 4M | E343273235 |
| HM6116LP-4 | 1 | Nch MOS 6K bits Static RAM | 4C | E34261164 |
| AM9114 | 2 | Nch MOS 4K bits Static RAM | 3К, 4К | E34121142 |
| ULN2003 | 2 | Hept Darlington TR Array | 10F, 10G | E3202003 |
| SN76489N | 2 | P.S.G. | 1M, 2M | E3676489 |
| LM393 | 1 | Dual Differential Comparators | 8D | E332393 |
| LM324 | 1 | Quad Operational Amplifiers | 1L | E334324 |

[2] Transistors

| Rating | Q'ty | Description | Location No. | Parts No. |
|---------|------|-------------|--|-----------|
| 2SA562 | 2 | Transistor | 61, 62, 60, 53 | E221562 |
| 2SA738 | 10 | " | 49, 50, 51, 52, 54, 55, 56, 57, 58, 59 | E221738 |
| 2SB857 | 7 | " | 44, 45, 46, 47, 69, 70 | E222857 |
| 2SC1398 | 27 | " | 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 35, 36, 37, 38, 39, 40, 68 | E2231398 |
| 2SC945 | 13 | ., | 1, 3, 4, 5, 6, 7, 8, 9, 63, 64, 65, 66, 67 | E223945 |
| 2SD837A | 5 | ,, | 30, 31, 32, 41, 42 | E224837 |
| 2SA733 | 1 | | 2 | E221733 |
| 10D1 | 60 | Diode | 1~3, 6~47, 49~62, Special: 63, 64, 65, 66 | E2110D1 |
| 1\$1588 | 2 | | 4,5 | E211S1588 |

[3] Capacitors

| Rating | Q'ty | Description | Location No. | Parts No. |
|--------------|------|-------------|---|-----------|
| 16V 220µF | 2 | Chemical | 1,64 | E5116227 |
| 50V 1µF (BP) | 2 | ,, | 56, 57 | E5150105 |
| 16V 10µF | 4 | ,, | 6, 13, 14, 58 | E5116106 |
| 16V 10k | 3 | Tantalum | 5, 8, 9 | E5416106 |
| 25V 104 | 3 | Ceramic | 140 (Parallel with 61) | E5225104 |
| 103 | 6 | | 50, 66, 67, 68, 69 | E5212103 |
| 101 | 22 | ,, | 20~25, 28~33, 37~41, 45~49 | E5212101 |
| 12V 104 | 80 | | 4, 7, 11, 12, 15, 16, 17, 51, 52, 53, 54, 55, 71~91, 93~139 | E5212104 |
| 221k | 1 | ., | 92 | E5212221 |
| 25V 470µF | 1 | Chemical | 65 | E5125227 |

[4] Resistors

| Ratin | g | Q'ty | Description | Location No. | Parts No. |
|--------------|-----------|------|--------------|---|-----------|
| 2.4kΩ | ½₩ | 6 | Carbon Solid | 88~92, 174 | E412242 |
| 4.7kΩ | | 1 | | 173 | E412472 |
| 68Ω | WW/ | 18 | ,, | 111~117, 132~138 | E414680 |
| 100Ω | | 4 | ··· /· | 155~157, 119 | E414101 |
| 220Ω | | 4 | | 1, 2, 3, 20 | E414221 |
| 240 Ω | | 20 | | 54~73 | E414241 |
| 270Ω | | 35 | " | 34~53, 74~76, 79~86, 93~97, 102 | E414271 |
| 470Ω | | 6 | " | 29~33 | E414471 |
| 150Ω | | 1 | ,, | 101 | E414151 |
| 510 Ω | | 1 | ,, | 22 | E414511 |
| 1kΩ | <i>.,</i> | 10 | ,, | 4, 18, 98~100, 140, 141, 169, 19, 178, 172, 171, 170 | E414102 |
| 1.1kΩ | | 1 | ,, | 8 | E414112 |
| 2kΩ | ,, | 27 | | 5, 9, 21, 24, 103~110, 120~131, 139, 6, 7 | E414202 |
| 2.2kΩ | ·· | 14 | | 118, 152, 153, 154 | E414222 |
| 33kΩ | ., | 6 | | 158, 159, 162, 163, 164, 168 | E414333 |
| 5.1k | ,, | 2 | " | 27, 142 | E414512 |
| 6.2k | •• | 1 | ,, | 23 | E414622 |
| 10kΩ | ,, | 16 | | 11, 26, 28, 145, 151, 160, 161, 165, 166, 167, 14~17, 12, 146 | E414103 |
| 20k | ·· | 1 | ·· | 10 | E414203 |
| 100kΩ | | 3 | | 143, 144, 147 | E414104 |
| 200k | ., | 1 | ** | 25 | E414204 |
| 510kΩ | | 1 | | 13 | E414514 |

[5] Misc

| Name | Qʻty | Rating | Location No. | Parts No. |
|-----------------------|------|-------------|------------------------|-----------|
| Coil | 11 | 10µH 500µA | L3~L8, L12~L18 | E71005106 |
| Registor Array | 2 | 1028 | RM1, RM2 | E4601028 |
| | 2 | 2228 | RM3, RM4 | E4602228 |
| Micro SW | 1 | | | E6401092 |
| Battery | 1 | VARTA 3160J | BAT1 | E010503 |
| Xtal | 1 | 8.2 MHz | X1 | E0118200 |
| IC Socket | 6 | HRS DL2 | 1A, 2A, 3A, 4A, 3M, 4M | E950024 |
| | 2 | HRS DL2 | 5A, 5L | E950040 |
| | 1 | HRS DL2 | 5D | R950016 |

Sub PCB

Sub PCB Location & Parts List



Sub PCB Parts List

| Item No. | Q'ty | Description | Location No. | Parts No. |
|----------|------|---------------|--------------|-----------|
| 74LS259 | 1 | TTL | 101 | E312259 |
| 74LS240 | 1 | | IC2 | E312240 |
| PC837 | 2 | Photo coupler | PC1, PC2 | E24837 |
| PC817 | 1 | " | PC3 | E24817 |
| 12V 104 | 3 | Ceramic | C1, C2, C3 | E5212104 |

| Name | Q'ty | Rating | Location No. | Parts No. |
|----------------|------|--------|--------------|-----------|
| Registor Array | 1 | 1028 | R1 | E4601028 |
| ** | 1 | 1024 | R2 | E4601024 |

Sub PCB Schematic Diagram





Main PCB Schematic Diagram







Wiring Diagram





-43-

Positions of Each Connector



Description of Each Connector

Descriptions of Each Connector



| L | | | | |
|------|-----------------------------|---------------------------------------|--|--|
| (1) | Coin SW [Upper] | (Sk/Bk) | CN7 10 ~ CN10 1 | (A) Reel Index 1st (BI) CN16 1 |
| (2) | Coin to Cash Box | (W/Bk) | CN7 9 ~ CN10 3 | (B) " 2nd (V) CN17 1 |
| (3) | - Space - | | | (C) " 3rd (Gy) CN18 1 |
| (4) | Change SW | (Pk/Bk) | CN7 8 ~ CN13 1 | (D) — Space — |
| (5) | Door Lock Key SW | (Gy/Bk) | CN7 14 ~ CN11 1 | (E) — Space — |
| (6) | Service SW | (R) | CN24 2 | (F) — Space — |
| (7) | Hopper Over Flow SW | (Gs) | CN25 3 | (H) Function SW (BI) CN25 7 |
| (8) | Door Open SW | (BI) | CN22 3 | (J) Coin SW [Lower] (Gs/Bk) CN7 11 ~ CN10 2 |
| (9) | Meter Reading SW | (W) | CN20 1 | (K) Reel Start SW (Sk) CN28 1 |
| (10) | Test SW | (Br) | CN24 1 | (L) Handle Unlock SW (V) CN26 1 |
| (11) | Reset SW | (Pk) | CN22 1 | (M) Handle Retern SW (Gy) CN27 1 |
| (12) | Coin Count SW | (Or) | CN25 2 | (N) Jackpot Reset SW (R) CN21 1 |
| (13) | - Space - | | | (P) - Space - |
| (14) | Motor Drive | (Br) | CN25 1 | (R) – Space – |
| (15) | Solenoid Drive | (Y) | CN25 6 | (S) — Space — |
| (16) | 7 Seg Anode 10 ⁷ | (Y/Bk) | CN7 33 ~ CN15 8 | (T) 7 Seg Anode 10 ⁵ (R/Bk) CN7 31 ~ CN15 6 |
| (17) | " " 10 ⁶ | (Or/Bk) | CN7 32 ~ CN15 7 | (U) " " 10 ⁴ (Br/Bk) CN7 30 ~ CN15 5 |
| (18) | " " 10 ¹ | (Pk) | CN7 27 ~ CN15 2 | (V) " " 10^3 (Sk) CN7 $29 \sim$ CN15 4 |
| (19) | " " 10 ⁰ | (W) | CN7 26 CN15 1 | (W) " " 10^2 (Gs) CN7 $28 \sim CN15$ 3 |
| (20) | - Space - | | ······································ | (X) 7 Seg Cathode a (Br) CN7 19 ~ CN15 14 |
| (21) | - Space - | | · · · · · · · · · · · · · | (Y) " " b (R) CN7 20 ~ CN15 15 |
| (22) | - Space - | | | (Z) " " c (Gs/Bk) CN7 21 ~ CN15 16 |
| (23) | - Space - | | | (a) " " d (Gn) CN7 22 ~ CN15 17 |
| (24) | - Space - | | | (b) " " e (BI) CN7 23 ~ CN15 18 |
| (25) | - Space - | - | | (c) " " f (V) CN7 24 ~ CN15 19 |
| (26) | - Space - | | | (d) " " g (Gy) CN7 25 ~ CN15 20 |
| (27) | Jackpot Lamp | (Gn/Bk) | CN7 34 ~ CN15 12 | (e) Jackpot Balance Counter (Or) CN24 4 |
| (28) | Sound | (BI/Bk) | CN23 1 | (f) Sound (V/Bk) CN23 2 |
| | | · · · · · · · · · · · · · · · · · · · | | |



| (1) | | 5, CN23 5, CN20 2, 2, CN31 1, CN17 2 | | CN7 6, CN10 8, 2, CN15 10 |
|------|--------------------------|---|-----------------------------|--------------------------------|
| (2) | | 9, CN22 2, CN26 2, 2, CN16 2, CN18 2 | (B) GND (Bk) CN4 10 CN13 |), CN7 7, CN11 3 , 3 |
| (3) | DC 5 V (Pk) CN25 CN18 | 4, CN27 3, CN16 2, 2 | (C) DC 5 V (Pk) CN7 3 | |
| (4) | DC 5 V (Pk) CN26 | 3, CN28 3, CN17 2 | (D) DC 5V (Pk) CN4 1 | |
| (5) | – Space – | | (E) AC 9.5 V (Gs) CN4 8 | |
| (6) | Coin Time Set SW | (Or) CN21 3 | (F) DC 12 V (R) CN4 4 | , CN6 4 |
| (7) | – Space – | | (H) DC 32 V (V) CN7 4 | ~ CN10 7 |
| (8) | - Space - | | (J) DC 32 V (V) CN4 1 | 1 |
| (9) | Insert Coin Lamp | (Br) CN7 16 ~ CN12 1 | (K) Jackpot Lamp (E | 81) CN6 3 |
| (10) | Pull Handle Lamp | (R) CN7 17 ~ CN12 3 | (L) Call Attendant Lamp (C | Gn) CN6 2 |
| (11) | – Space – | | (M) Door Open Lamp () | CN6 1 |
| (12) | - Space - | | (N) Total Payout Counter () | CN24 5 |
| (13) | Call Attendant Lamp | (Y) CN7 15 ~ CN15 11 | (P) Coin to Cash Box (C | Gn) CN24 6 |
| (14) | Tilt Lamp | (Gs) CN31 7 | (R) Handle Unlock Coil (C | Gs) CN5 4 |
| (15) | Coin Lock Out Coil | (BI) CN7 12 ~ CN10 5 ~ CN39 3 | (S) Total In Counter (E | II) CN24 7 |
| (16) | Diverter Solenoid | (V) CN7 13~CN10 4 | (T) Reel Motor 1st (C | Gn) CN16 8 |
| (17) | Reel Motor 1-1 | (R) CN16 4 | (U) " 2nd (V | V) CN178 |
| (18) | " 1-2 | (Y) CN16 5 | (V) " 3rd (0 | Dr) CN18 8 |
| (19) | " 1-3 | (Sk) CN16 6 | (W) - Space - | |
| (20) | " 1-4 | (Gs) CN16 7 | (X) — Space — | |
| (21) | " 2-1 | (R) CN17 4 | (Y) 4th Coin Lamp (E | 81) |
| (22) | " 2-2 | (Y) CN17 5 | (Z) 3rd " (C | in) |
| (23) | " 2-3 | (Sk) CN17 6 | (a) 2nd " (C |)r) |
| (24) | " 2-4 | (Gs) CN17 7 | (b) 1st " (E | ir) |
| (25) | " 3-1 | (R) CN184 | (c) 5th " (\ | /) · |
| (26) | " 3-2 | (Y) CN185 | (d) — Space — | |
| (27) | " 3-3 | (Sk) CN18 6 | (e) — Space — | |
| (28) | " 3-4 | (Gs) CN18 7 | (f) - Space - | |

Note: In case of a credit type machine, some of the aforesaid descriptions will be changed as follows.

[ECN-1]

| | 27. Jackpot Lamp | (Gn/Bk) | CN7 34 ~ CN39 3 | _ |
|---|------------------|---------|-----------------|---|
| 1 | Er. ouckpor Lump | | 0117 04 01100 0 | |

[ECN-2]

| Α. | GND |) | | (Bk) | CN41 1 ~ CN31 1 |
|-----|-------|------|---------|-------|---------------------|
| C. | DC 5 | 5 V | | (Pk) | CN41 14 ~ CN15 13 |
| Υ. | 4th (| Coin | Lamp | (BI) | CN41 2 ~ CN31 2 |
| Ζ. | 3rd | " | " | (Gn) | CN41 5 ~ CN31 5 |
| a. | 2nd | " | " | (Or) | CN41 3 ~ CN31 3 |
| b. | 1st | " | " | (Br) | CN41 4 ~ CN31 4 |
| c. | 5th | " | " | (V) | CN41 6 ~ CN31 6 |
| 13. | Call | Atte | ndant L | amp (| (Y) CN7 15 ~ CN39 2 |

[Other]

| CN42 (Main PCB) | | | | | |
|-----------------|--------------|------|------------------|--|--|
| CN42 1 | Collect Lamp | (Br) | CN41 9 ~ CN33 1 | | |
| CN42 2 | Collect SW | (R) | CN41 10 ~ CN33 2 | | |
| CN42 3 | Max Bet SW | (Y) | CN41 11 ~ CN33 3 | | |
| CN42 4 | Bet SW | (Gn) | CN41 12 ~ CN33 4 | | |
| CN42 6 | GND | (Bk) | CN41 13 ~ CN33 6 | | |

Sound AMP PCB

IC Location



Schematic Diagram



Parts List

| Rating | Qʻty | Description | Part No |
|------------|------|-----------------------------|-----------|
| MB3730 | 1 | Audio Amplifier | E3333730 |
| 1000µF/25∨ | 1 | Chemical Capacitor | E5125108 |
| 22µF/25V | 1 | | E5125226 |
| 4.7µF/25∨ | 1 | ,, | E5125475 |
| 0.1µF/25∨ | 2 | Ceramic Capacitor | E5225104 |
| 10kΩ ¼W | 1 | Carbon Solid Registor | E414103 |
| 51kΩ ¼W | 1 | " | E414513 |
| 4.7Ω ¼W | 2 | ** | E41447 |
| RV16YP 1kΩ | 1 | Carbon Variable Registor | E47016102 |
| 470µF/16V | 1 | Chemical Capacitor | E5116477 |

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| 4. SPECIFICATIONS AND | POWER REQUIREM | ENTS |
|------------------------------|----------------|--------------------|
| A. ELECTRICAL SPECIFICATIONS | | |
| 1. Power Supply | Primary | Secondary |
| | 100 Vac | 9.5 Vac |
| | 115 Vac | 24 Vac |
| | 120 Vac | |
| | 220 Vac | |
| | 240 Vac | |
| 2. Power Consumption | 115 W @ 1.0 | Amp (In Idle Mode) |
| | | Amp (In Payout Mod |
| 3. Operating Voltages | 95 Vac to 1 | 25 Vac OR |
| | 190 Vac to 2 | 45 Vac |

4. Fuse Designations and Power Supply Illustration



1-11

5. MACHINE FEATURES

- 1. All functions and mechanisms are microprocessor controlled.
- 2. Pulsed stepper motors conduct reel rotation and stop position is random generator controlled.
- 3. Useful functions such as error code information, self-tests and software meter reading programs are available for the user's convenience.
- 4. This machine has been built with a minimum of mechanical assemblies to insure longer life.
- 5. Total internal unitization enables each unit, such as hopper assembly, reel mechanism, logic board, power supply, etc., to be simply installed and removed.
- 6. Photo optics conduct coin timing and counting.
- 7. RAM battery backup for the Main Logic Board board in case of power failure or game shut-down.
- 8. Low incoming voltage sensing circuitry.
- 9. Tower lights and sound PROMS are included.
- 10. Six (6) month warranty (except as otherwise provided by the sales agreement).
- 11. The Universal Slot Machine has a standard 32 programmed stop capability with 64 stop capability available on some models.
- 12. All parts used in the machine are of the highest quality and due consideration has been given as to their layout and configuration.

Game Operation

| | 1. GENERAL SEQUENCE OF OPERATION | | | | |
|--|--|--|--|--|--|
| SECT | ION 1. The Machine is Ready for Play | | | | |
| | ION 1. The Machine is Ready for Play. A. The INSERT COIN lamp is flashing. | | | | |
| | - | | | | |
| | B. The coin lockout coil is energized. | | | | |
| | C. The COINS PLAYED METER displays '0'. | | | | |
| D. The LAST GAME COINS PLAYED meter displays a number (NOT '0') of to or less than max coin. | | | | | |
| 1 | E. The award glass coin lamp corresponding to the number displayed on the | | | | |
| - | LAST GAME COINS PLAYED meter should be lit. | | | | |
| 1 | F. The handle should be in the full upright position. | | | | |
| | | | | | |
| | G. The WIN METER displays the previous game's results. | | | | |
| 1 | H. All in-ports are being monitored at an approximate rate of 125 times per second. | | | | |
| SECT | ION 2. Coin is inserted. | | | | |
| | A. The coin is validated by the accepting device. | | | | |
| | B. The coin is sensed (counted) by the coin-up optic (in-port 007), timed and | | | | |
| - | passed. | | | | |
| (| C. The coin is sensed by the coin-down optic (107) and passed. | | | | |
| 1 | 1. The TOTAL-IN magnetic counter increments. | | | | |
| | 2. The Coin-in sound is activated. | | | | |
| | 3. The award glass lamp increments. | | | | |
| | 4. The COINS PLAYED meter increments. | | | | |
| Ι | D. The COIN ACCEPTED lamp illuminates. | | | | |
| | E. The handle solenoid energizes. | | | | |
| | 1. The handle release optic (206) is turned 'off'. | | | | |
| | 2. The handle mechanism is mechanically unlocked. | | | | |
| F | F. The SPIN button lamp illuminates (if applicable). | | | | |
| | G. Coin is sensed by the coin-to-cash-box optic (006) if the diverter is open. | | | | |
| | 1. The COIN To CASH BOX magnetic counter increments. | | | | |
| SECT | ION 2A. Maximum coin is inserted. | | | | |
| H | I. The coin lockout coil is de-energized. | | | | |
| Ι | . The INSERT COIN lamp is turned off. | | | | |
| SECT | ION 3. The handle is pulled. | | | | |
| | A. The handle return optic (205) is turned 'on'. | | | | |
| A | | | | | |

SECTION 3A. Completion of the downstroke.

- C. The downstroke optic (207) is turned 'on'.
- D. The handle release optic (206) is turned 'on'.
- E. The coin lockout coil is de-energized.
- F. The COIN ACCEPTED lamp is turned off.
- G. Any WIN METER ERROR CODE information is removed from the display.

SECTION 3B. The handle is returned to the full upright position and locked.

H. The handle return optic is turned 'off'.

SECTION 4. Reel Spin.

- A. After the SPIN button is pressed or after the handle release optic (206) is turned 'on'.
 - 1. see SECTION 3A.
 - 2. Random selection is made.
 - 3. Reel motors are ordered to position.
- B. The reel motors spin and their positions are determined by reel optics.
- C. WIN METER prior win information is reset to '0'.
- D. 1st Reel indexes as the reel sound is activated.
- E. 2nd Reel indexes as the reel sound is activated.
- F. 3rd Reel indexes as the reel sound is activated.
- G. 4th, then 5th reels index if applicable.

SECTION 5. "NO WIN" Situation.

- A. LAST GAME COINS PLAYED meter is updated.
- B. COINS PLAYED meter is reset to '0'.
- C. Meter reading program is accessible.
- D. Return to 'Ready to Play' status.

SECTION 6. "WIN" Situation with Hopper Payout.

- A. 100 Vac is switched to the hopper motor and to the hopper kicker solenoid via the hopper relay board allowing the motor to turn and the solenoid to pull the kicker back.
- B. The payout sound is activated.
- C. The count switch is activated for each coin exiting the hopper.
 - 1. The TOTAL OUT magnetic counter increments for each coin to be paid out.
 - 2. WIN METER display increments as coins are dispensed.
- D. The count switch is activated for the last coin to be dispensed.
 - 1. The kicker solenoid is de-energized.
 - 2. The hopper motor is turned off.



A. Machine Exterior



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B. Machine Interior



COMPONENT ASSEMBLIES

Note: The installation / replacement of all components described in this section can be accomplished by reversing the removal procedure.

6. COIN TRACK

- A. Basic Operation: When a coin is inserted into the coin entry unit, it first reaches the coin accepting device where it is either mechanically or electronically validated, accepted, or rejected. If rejected it is sent through the coin reject chute back into the player's coin tray. If accepted, it is passed through two optic devices which count the coin, time it and ensure that it is travelling in the proper direction. If the coin passes properly through the optics, it is then directed into the hopper or the cash box, depending on the level of coins in the hopper.
- B. Removal: To remove the coin track, first unplug the 9-Pin connector which can usually be found tucked beneath the control panel, and any connectors which may be plugged into an electronic accepting device. Next, remove the (2) 4mm screws at the bottom of the coin track which also secure the coin drop chute. These screws may be partially hidden from view by the chute. Then, remove the (2) 4mm screws at the top of the track which also secure the coin entry unit.
- C. Removal of Parts from the Coin Track:
 - **1.** Accenting device -, There are 2 types of coin track assemblies which may be found. One type allows the accepting device to be removed by pulling up on 2 spring-loaded arms on either side of the coin track and then removing the device by pulling the device outward from the top. The other type allows removal by pushing down on one release arm on the right side of the track and pulling out the device from the right side.
 - <u>2. Deflector Assembly (Optic Bracket)</u> The optic bracket may be removed by first removing the E-ring located on the deflector guide pin. Next, remove (2)
 4mm screws located behind the deflector assembly. The optic bracket should then slide off as the guide pin is removed from the solenoid link.
 - <u>3. Diverter Solenoid -</u>, To remove the diverter solenoid, remove by desoldering the 2 leads to the solenoid and then removing the (2) 3mm screws securing the solenoid to the optic base. The solenoid should now slide easily off the plunger for removal.
 - <u>4. A. Optics Conventional Types -</u> Any of the three coin track optics can be removed by removing the (2) 4mm screws securing the optic base and then desoldering the signal and voltage wires.
 - **<u>B. Optics Plastic Encased Tvoe -</u>** These optics can be removed by disconnecting the 3-Pin connector and removing the 4 mm mounting screw. The optic *will* then slide off the mounting base.
- **D.** Preventive Maintenance: It is suggested that excess coin dust and dirt be brushed or otherwise removed on a periodic basis and that moving parts be regularly checked for ease of movement.

NOTE: The coin track assembly in the Universal Slot Machine has been designed so that NO lubrication is ever necessary. In fact, lubrication will only dampen proper operation of the various parts.

7. HANDLE MECHANISM

- A. Basic Operation When the first coin of a new game is deposited, the solenoid located at the top of the handle mechanism is energized. The plunger link assembly is then pulled back, mechanically releasing a lever inside the mechanism preparing the handle for pull. When the handle is pulled, a sequence of optic signals tell the CPU to initiate reel spin. Once the handle is partially pulled, it cannot be returned to normal upright position except after full downstroke. A ratchet system on the mechanism insures this.
- B. Removal Note: Before attempting removal of the handle mechanism, removal of the reel mechanism is necessary. To remove the handle mechanism, remove the center bolt which secures the external handle hub and lever. Remove the hub and lever. Remove the (3) 5mm screws which hold the reel mech shelf bracket to the handle mech and the optic support bracket. Position the optic support bracket out of the way. Loosen (it is not necessary to remove) the (3) 5mm screws holding the shelf bracket to the shelf. Unplug all 3 optic connectors as well as the solenoid connector. Two of the optic connectors are located beneath the reel mech shelf, under the hard meter box. Remove the (5) 10mm hex nuts which secure the handle mech to the cabinet wall. There are 2 nuts at the top of the mech and 3 at the bottom. To remove the mechanism, slightly lift the reel mech shelf allowing clearance of the handle mechanism and slide the mechanism out. (PHOTO)
- **C. Removal of Individual Parts:**

The following parts may be removed from the handle mechanism without removing the mechanism from the machine:

By removing the center handle bolt the following parts may be removed - Trip Lever B, Trip Lever Collar and Trip Lever Guide (Please consult parts lists for part numbers, locations and illustrations). The handle solenoid may be removed by removing the (4) 3 mm screws securing it to the base plate. It may be necessary to first remove the (2) 5mm flat head screws which fasten the large "D" spring to access the solenoid's 2 inner screws. The base plate will become free once the last screw is removed so be certain to remove it once the last screw is removed. The plunger link and slide bracket assembly can be removed by extracting the 2 cotter pins which hold these parts in place.

D. Access of Internal Parts - Once the handle mechanism has been removed, the back plate must be removed to access the inner parts. To do this, remove the (3) 5mm screws from the bottom of the mechanism, (1) 5mm screw, (1) 5mm flat head screw and (2) 3mm solenoid screws from the top of the unit. Also, remove one E-ring which secures the lock lever end pivot pin (G). Remove all external components fitted on the lock lever shaft. The back plate may now be removed exposing the internal parts. (See Illustration)

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Components and Assemblies

E. Preventive Maintenance -There are several key parts on the handle mechanism which should be well-greased for longer service. They are, the ratchet lever, lock lever end, handle boss roller bearings and trip lever collar. (PHOTO)



After removing and loosening the appropriate hardware, disconnect the optic and solenoid connectors.



After all hardware is removed or loosened and all connectors have been disconnected, lift the reel mechanism shelf to allow the handle mechanism removal.

8. REEL MECHANISM

- A. **Basic** Operation Upon receiving the proper handle optic signals, the CPU will spin the reels to their ordered stop position. The CPU monitors reel spin through reel optics and after the reels have completed two (2) revolutions, they are ordered to their proper position.
- **B. Removal -** The reel mechanism is removed by unplugging each reel motor connector, removing the (2) 4mm screws which fasten the reel mech to the shelf and then lifting the mechanism off the shelf. Each of the individual reel motor assemblies are self-contained for easy removal and replacement should the need arise. Remove the (4) 4mm screws securing the assembly to the entire mechanism.
- C. Replacement of Reel Strips To remove the reel strip from the supports, find the end-point overlap of the strip. Lift the end slowly and peel the strip off. It is advisable to remove any remaining adhesive from the supports to ease in re-applying new strips. To apply new strips it is important to start the strips at the correct starting position. The starting point can be located in the following manner and this method can be used for all Universal reel strips. Initially, apply double-sided adhesive tape to both reel strip supports. Locate the optic interrupter on one of the spokes of the support attached to the motor. Rotate the support 180 degrees and locate the spoke exactly opposite the one with the optic interrupter. Use the support tab facing opposite the interrupter as the starting point and count clockwise 3 tabs (not including the starting tab). Align the bottom of the reel strip with the bottom edge of the fourth tab as this is the position from which the reel strip will be applied. Apply the reel strip in a counter-clockwise manner making certain that there is little or no gap between the edge of the reel strip and the inner ridge of the support. To seal the strip in place, apply a small strip of double-sided adhesive tape on the reverse side at the top of the strip. (See Illustration)
- **D. Preventive Maintenance -** The female connector pins should be checked every 2 or 3 months for signs of poor connections. If these pins should become spread apart due to normal machine vibration and wear, poor connections and reel tilts will occur. Reel optics should also be kept free of excess dust and dirt to ensure trouble-free operation. *NOTE: NEVER grease or lubricate any part of the reel mechanism.*

9. STANDARD HOPPER UNIT

A Basic Operation - The hopper mechanism is an electro-mechanically operated, electronically controlled device. When a winning combination is hit, the hopper relay board receives signals from the main logic board to energize 2 relays which then allow 100 Vac to be applied to both the hopper motor and kicker solenoid. As the motor activates and turns the coin disk, coins are dispensed. As coins exit the hopper they pass under the roller, which, when forced up by the passing of the coins, activates the count switch. After the correct amount of coins is dispensed, the sig-



Step 1- Locate the starting position for the reel strip by finding the optic interrupt tab and rotating the reel 180° . The spoke opposite the one with the tab is the start point.



Step 2 - Apply the end of the reel strip to the third tab from the starting spoke.





Step 3 - Apply the strip in a counter-clockwise manner. By slightly squeezing the supports together, no gaps will appear between the edge of the strips and the inner ridge of the supports.

Step 4 - Place a strip of double-sided tape to seal the reel strip.

nals are removed from the relay board, disabling the motor and the kicker solenoid. As the kicker is disabled, any coins about to be dispensed are 'kicked' back into the hopper.

- B. Removal To remove the hopper, disconnect the 9-Pin connector and slide the hopper out of the machine.
- C . Removal of Parts:

Hopper Bucket / Bowl Assembly - Unplug the 2-Pin connector used for the hopper probe and remove bowl bolts 4, 3 and 1 going in a clockwise manner. It is not necessary to remove the bolt at the bottom as the bucket will slide off and on this bolt. When replacing the bucket, the proper arrangement of washers and springs on the bolts is essential for maximum performance and longer bowl life. Possible damage to the bowl can result from improper placement of washers and springs. (See diagram)



Hopper Spring and Washer Diagram

- Coin disk Remove the bucket as described above. Remove coin shifter and the coin guard / coin runner assembly. Remove the 4 screws securing the coin disk and stirrer (if present) to the disk bushing and the coin disk will slide off the bushing hub. When replacing the coin disk, it is advisable to grease the roller bearing disk which lies beneath the coin disk. This is the ONLY part on the hopper assembly which requires grease.
- **Gear Box -** Remove the bucket and coin disk as described above, and the rear cover. Remove the 4 screws which fasten the motor / gear box assembly to the motor base plate. Snip the wire ties fastened to the hopper motor wires and take the motor assembly from the rear of the hopper. Remove the 4 long flat-head screws securing the gear box to the motor making certain not to lose the large spacers from between the gear box plate and the gear box. The gear box can now be removed from the motor. Remove the disk bushing by loosening the 2 Allen screws and sliding the bushing off the gear shaft.

Components and Assemblies

NOTES: When replacing the gear box several points should be kept in mind. 1) Be certain to use the same short screws to refasten the motor base plate to the hopper base plate. Failure to use these screws will results in damage to the roller bearing disk. 2) The shaft of the gear box should be centered in the opening of the hopper base plate. Coin jams can occur if the shaft is sufficiently off-center.

10. STANDARD HOPPER DENOMINATION CHANGES

The Universal hopper is designed for ease in changing to another denomination. The following chart lists the required parts changes.

| 1Coin Guard | | | | | | | | |
|----------------------|-----------------------------------|----------|---------|---------|----------|--------------|--|--|
| 2Coin Runner (Knife) | | | | | | | | |
| 3Coin Disk | | | | | | | | |
| | 4Left Side Plate 5Bowl Support | | | | | | | |
| | | | | | (A) = | Added | | |
| | | | | | | | | |
| | | | | | nel(R) = | | | |
| | | | E | | | | | |
| | | | E | • • | | | | |
| From / To | 5c | 10c | 25c | 50c | \$1.00 | \$5.00 - \$2 | | |
| 5c | x | 1,2,3,5 | 2,3 | 2,3 | 1,2,3,5 | ALL PLU | | |
| | X | 10 | | 6R,8R | 6R,7D,8R | 6R,7D,8R | | |
| 10c | 1,2,3,5 | x | 1,2,3,5 | 1,2,3,5 | 1,2,3,5 | ALL PLU | | |
| | 10 | x | | | 6R,8R | 8R,7D,8R | | |
| 25c | 2,3 | 1,2,3,5 | x | 2,3 | 1,2,3,5 | ALL PLU | | |
| | | 10 | X | | 6R,8R | 6R,7D,8R | | |
| 50c | 2,3 | 1,2,3,5 | 2,3 | x | 1,2,3,5 | ALL PLU | | |
| | | 10 | | x | 6R,8R | 6R,7D,8R | | |
| \$1.00 | 1,2,3,5 | 1,2,3,5 | 1,2,3,5 | 1,2,3,5 | x | 3,4,7D,9 | | |
| | 6A,8A | 6A,8A,10 | 6A,8A | 6A,8A | x | 10 | | |
| \$5 - \$100 | 1,2,3,4 | 1,2,3,4 | 1,2,3,4 | 1,2,3,4 | 3,4,7,9 | x | | |
| | 5,6A,7 | 5,6A,7 | 5,6A,7 | 5,6A,7 | 10 | X | | |
| | 8A,9,10 | 8A,9,10 | 8A,9,10 | 8A,9,10 | | x | | |

11. HIGH-SPEED HOPPER

- **A. Basic Operation -** When a winning combination is hit, a signal is sent to the hopper relay board to allow power to be applied to the hopper motor. As coins are dispensed, they are optically counted. When the CPU detects the proper number of coins has been dispensed a signal is sent to the relay board to electronically brake the motor instantly, preventing further coins from being dispensed.
 - **Optic Switch** The high-speed hopper is adaptable for use with either gray or black TTL optic systems. For use with the gray optic system, the switch (located on the relay board) must be in the position nearest the 16-Pin connector. When used in a black optic system, the switch must be in the position away from the connector.

B Removal of Parts:

- **Bucket** Unplug the hopper probe connector. Rotate the bucket counter-clockwise until the bucket is ungrooved. The bucket can now be removed.
- **Coin Separator** / **Denominational Spacers** Remove the (3) 4mm screws along the outer edge of the separator. Lift the separator off taking care not to lose the spacers positioned beneath the separator. These spacers determine the denomination of the hopper along with the coin guide rail.
- **Turn Table** Remove the 4mm screw securing the bearing and baffle. Lift these 2 parts off the baffle shaft and remove the 3 flat head screws securing the baffle shaft and turntable.
- **Denomination Changes** To change the denomination of the high-speed hopper, the 3 spacers located beneath the coin separator, and the guide rail must be changed.

| HOPPER DENOMINATION | | COIN CAPACITY TO PROBE LEVEL | SPEED OF PAYOUT |
|------------------------|---------------------------------------|---------------------------------|---|
| STANDARD HOPPER | HOPPER \$1.00 \$5.00 and up | | 8 coins per second 8 coins persecond 7 coins per second 5 coins per second 4 coins per second 3 coins per second lowest available level |
| HI- SPEED HOPPER | 5c 25c 50c | 3000 2000 1200 | 20 coins per second 20 coins per second 18 coins per second |

HOPPER CAPACITY CHARTS

11. HIGH-SPEED HOPPER

- **A. Basic Operation -** When a winning combination is hit, a signal is sent to the hopper relay board to allow power to be applied to the hopper motor. As coins are dispensed, they are optically counted. When the CPU detects the proper number of coins has been dispensed a signal is sent to the relay board to electronically brake the motor instantly, preventing further coins from being dispensed.
 - Optic Switch The high-speed hopper is adaptable for use with either gray or black TTL optic systems. For use with the gray optic system, the switch (located on the relay board) must be in the position nearest the 16-Pin connector. When used in a black optic system, the switch must be in the position away from the connector.

B Removal of Parts:

- **Bucket** Unplug the hopper probe connector. Rotate the bucket counter-clockwise until the bucket is ungrooved. The bucket can now be removed.
- **Coin Separator** / **Denominational** Spacers Remove the (3) 4mm screws along the outer edge of the separator. Lift the separator off taking care not to lose the spacers positioned beneath the separator. These spacers determine the denomination of the hopper along with the coin guide rail.
- **Turn Table -** Remove the 4mm screw securing the bearing and baffle. Lift these 2 parts off the baffle shaft and remove the 3 flat head screws securing the baffle shaft and turntable.

Denomination Changes - To change the denomination of the high-spped hopper, the 3 spacers located beneath the coin separator, and the guide rail must be changed.

HOPPER CAPACITY CHARTS

| | PPER MINATION | COIN CAPACITY TO PROBE LEVEL | SPEED OF PAYOUT |
|---------------------|--|---------------------------------|--|
| STANDARD HOPPER | 10c 25c 50c \$1.00 \$5.00 and up | | 8 coins persecond 7 coins per second 5 coins per second 4 coins per second 3 coins per second |
| HI- SPEED HOPPER | 25c | | 20 coins per second |

12. LIGHTING ASSEMBLIES

The Universal Slot Machine may come with one of two (2) possible fluorescent lighting systems. They will both be described below.

- BALLAST / STARTER SYSTEM This system uses a ballast / starter configuration to step down incoming voltage of 100 Vac to 40 Vac. The 8 watt bulb uses a .17A, 11 Watt unit, the 10 watt bulb uses a .23A, 13 Watt unit and the 15 Watt bulb uses a .3 A, 19 Watt unit.
 - LAMP DRIVER UNIT On some machines, electronic lamp drive units are used to step up 24 Vac to the necessary 40 Vac. These are small self-contained units which are easily replaceable. The 6 and 8 Watt bulbs use a .27 A unit (FL 6/8) and the 10 and 15 Watt bulbs use a .68 A (FL 10/15) unit.

The following chart lists the various lighting configurations for Universal Slot Machines.

| | A, B, C, D | NARROW | INTERMEDIATE |
|--------------|------------------|-------------|--------------|
| | CABINET | CABINET | CABINET |
| Top Glass | 10 Watt Bulb | 8 Watt Bulb | 10 Watt Bulb |
| | Ballast System * | Lamp Driver | Lamp Driver |
| Reel Glass | 8 Watt Bulb | 6 Watt Bulb | 6 Watt Bulb |
| | Ballast System | Lamp Driver | Lamp Driver |
| Bottom Glass | 15 Watt Bulb | 8 Watt Bulb | 10 Watt Bulb |
| | Ballast System | Lamp Driver | Lamp Driver |

LOCATION OF DRIVE UNITS

The Ballast or Lamp Drive Unit for the Top Fluorescent Unit can be located on the rear of the top shadow box assembly. The units for the reel frame lighting and bottom glass lighting are mounted on the inside of the front door panel. The lamp driver units are all self-contained and can be changed individually. The ballast units are mounted in a housing and the entire housing must be removed from the door panel to change one of the ballasts. The starters for any of the ballasts can be accessed directly for easy removal and replacement.

- **TOP UNIT LIGHT** REMOVAL Open the front door and remove the name strip surround by pushing from underneath. Remove the top glass by pushing from underneath and pulling the glass forward. To remove the bulb, turn it 1/4 turn and carefully pull the bulb straight out of the socket.
- **REEL GLASS LAMP REMOVAL** Remove the fluorescent lamp guard by removing the (2) 4mm screws at the top of the reel glass frame. Remove the lamp in the same manner as described above.
- **BOTTOM GLASS LAMP REMOVAL** The bottom glass and frame will have to be removed before the lamp can be removed. This is done by removing (2) 4mm screws located at either end of the inner door panel and loosening the 2 inner screws. The bottom glass frame can then be lifted up and out for removal. The exposed bottom bulb can now be removed as previously described.



Illustration of Bottom Glass Retaining Screws

- **INCANDESCENT LAMP REMOVAL** All of the small display lamps used in the Universal Slot Machine can be removed and replaced in the same manner. They are all socketed on P.C. board assemblies (except those located in the control panel switch assemblies). Turn the socket 1/8 turn to remove the bulb from the P.C. board and pull the lamp from the socket.
- **CONTROL PANEL LAMP REMOVAL** Open the front door, locate the lamp to be removed and gently but firmly pull the lamp holder from the casing. Then carefully pull the lamp from the socket.
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3. POWER SUPPLY

Circuit Description - The incoming line voltage passes through a noise filter and is applied to the 115 Vac primary winding of the transformer. There the voltage is stepped down to provide secondary output voltages of 24 Vac and 9.5 Vac. The 24 Vac winding is sent through two (2) separate bridge rectifier / filter capacitor configurations to achieve output voltages of approximately 30 Vdc and 35 Vdc. These voltages are used to power the lamps, reel motors and solenoids. The 24 Vac line is tapped directly to power the handle solenoid and the tower lamps. The 9.5 Vac output is fed through a bridge rectifier / filter capacitor configuration to achieve 12 Vdc which is used to power the sound amplifier. The 9.5 Vac is also fed through another similar configuration. The output is then fed through a series-pass 5 Vdc Voltage regulator which is used to power the main logic board and all game optics.

Types - There are three different types of power supplies that can be found in a standard Universal Slot Machine. The type found would depend on the purchase period.

- 1) **GREEN DOT** This was the first type of power supply used and it can be identified by the TOWER-3 P.C. board which is mounted on the inside of the cover to the unit. On earlier machine versions, the solid state relay (SSR) used to energize the handle solenoid was mounted exterior to the power supply. It can be located either on the cabinet inside rear wall or just above the handle mechanism. This type of power unit cannot be substituted for any other type of unit as it will not energize the handle solenoid on either RED or YELLOW DOT type machines. (Refer to the handle wiring diagram on the following page)
- 2) RED DOT This type of power supply is the most widely used and it can be identified by the presence of a TOWER-4 P.C. board mounted on the inside cover of the unit and by the presence of 100 Vac measured across pins 6 and 12 of the 12 Pin connector. The handle SSR is mounted directly on the TOWER-4 board so there is no need for the external SSR as in the GREEN DOT. The RED DOT can only be used in games that use the ballast / starter fluorescent lighting scheme. (Refer to the handle wiring diagram on the following page).
- 3) YELLOW DOT This type of power unit is similar to the RED DOT but with one important exception. Across pins 6 and 12 of the 12 Pin connector, 24 Vac is measured. This type of power supply can only be used in games that utilize the electronic lamp driver fluorescent lighting system.

IMPORTANT NOTE: Attempts to substitute RED DOT for YELLOW DOT or vice versa will result in blown fuses and possible damage to the main logic board.



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4. COIN DIVERTER SOLENOID

- EARLY MODEL The earlier version of the diverter solenoid utilizes a 70 ohm coil which is initially pulsed closed when it receives 35 Vdc courtesy of Q69 on the main logic board. After approximately 4 seconds, Q69 is turned off and Q70 is turned on which provides a necessary holding voltage of approximately 12 Vdc. With TYPE-1 program versions this action occurs after every eighth game. With TYPE-2 program versions, this action occurs after every game. To maintain proper current for the solenoid on the early model, resistors R175 and R176 have values of 150 ohms and 270 ohms respectively.
- LATE MODEL Operation is exactly the same as on the EARLY MODEL. The differences with the late model are that the solenoid coil resistance has been changed to 48-50 ohms and R175 and R176 have been changed to 330 ohms.

IMPORTANT NOTE: If a LATE MODEL diverter solenoid is used with a main logic board containing the EARY MODEL resistor values the diverter will NOT STAY CLOSED. If a conversion to the LATE MODEL diverter system is <u>necessary.</u> <i>it will also be necessary to change R175 and R176.



Diverter Solenoid drive circuitry for the Early (left drawing) and Late (right drawing) Models.

5. STEPPER MOTOR CONTROL

The Universal Slot Machine uses hybrid bifilar stepper motors in the reel mechanism. The continuous rotation of the motor is produced by sequential excitations of the phase windings in a clockwise manner. The bifilar wound motors are controlled with unipolar drive transistors Q17-Q29 which receive latched output signals from I.C.'s 6L, 6M, 7L and 7M on pins 4, 5 and 6. The input index pulses are monitored through Q7-Q9 and fed to data selectors 6B, 7A and 7B via inverter 7C. Each stepper motor pulses 200 steps to make one complete revolution. Reel position is monitored by the CPU through an optic which is mounted on the reel bracket. The optic interrupter signals the CPU that, upon optic interruption, the reel is at reference point 0. After the optic has been interrupted twice, the program then orders the reel to its randomly selected stop position.

6. OPTICS

In a Universal Slot Machine, any one of three types of optic systems can be found. They are described as follows:

- Conventional Large Black Optic This type of optic has a standard photo-transistor
 / photo-diode configuration. Each optic uses three (3) wires one for 5 Vdc, one for ground and one for the signal. When not in an interrupted state the signal line is seen as a logic HI. When interrupted, it is seen as a logic LO.
- 2) Gray TTL Plastic Encased Optic This type of optic operates in exactly the same manner as the conventional large black optic and is fully interchangeable and compatible with same.
- 3) Black Plastic Encased Optic This type of optic operates in the same manner as the Gray TTL except that in the interrupted state, the signal line is seen as a logic HI.



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8. MAIN LOGIC BOARD

At the heart of the Universal main logic board is a Z-80A microprocessor. The Z-80A CPU is a MOSLSI 40-Pin package which operates at a 4 MHz clock rate. This clock rate is provided by X1, an 8.2 MHz crystal and a divide-by-two counter (I.C. 2F). The Z-80A receives its instructions from two (2) EPROMS which are located at 2A and 4A. Input multiplexers 6A, 6B, 7A and 7B are constantly monitored by the CPU for changes in status. Monitoring frequency can vary from 4msec to 20 msec per in-port. If a change in status is detected, the CPU then refers to the EPROMS for further instructions. If the program has determined that an action needs to be taken in response to the change in status of an in-port, the appropriate signals are generated which enable the output latches 6F // 7M which in turn enable the appropriate output port.

Example : Sequence of events for maximum coin-in. As the coin is inserted, the coinup optic is activated, then the coin-down optic. The coin-up switching transistor, Q63

and coin-down transistor, Q65, which were on showing a logic LO at I N07 (I.C. 6A Pin 6) and 1N17 (I.C. 6A Pin 5) now turn off, putting a logic HI at those in-ports. The program, sensing a change in status in these in-ports, takes the information from 6A at data-bus line D6 and D7 and issues new orders to the CPU to enable latches 6F (Port E4, Pin 11 - Lockout Coil De-Energize), 7H (Port B7, Pin 3 - Turn off Insert Coin Lamp and Port E7, Pin 11 - Increment Coin-In Electromechanical Meter), 6M (Port 32, Pin 7 - Increment Coin Lamp) and the appropriate latches for 7-Segment display. by activating these latches, the ports E4, B7, E7 and 32 are sent logic HI turning on transistors Q41, Q35, Q53 and Q14 resp. (omitting the LED signals). The CPU will now wait for further input action, either handle pull or spin button activation.

9. POWER-UP DELAY CIRCUIT

Upon initial power-up, the CPU does not receive its 5 Vdc supply until the power supply has stabilized voltage available. This occurs only after the 5 Vdc filter capacitor has fully charged and the 5 Volt regulator can supply the necessarily regulated 5Vdc. Looking at the circuitry, timer 2G requires a trigger at pin 2 to 'turn on' and this trigger is supplied by Q3. Q3, through voltage divider R23-R24, will turn on only when Vcc reaches 5 Vdc. The CPU then receives the soft-reset signal at pin 26.

10. LOW-VOLTAGE LINE SENSING

The 9.5 Vac winding on the secondary of the transformer in the power supply is connected directly to the main logic board at ECN-1 pins 5 and E. If the incoming voltage drops below proper operating level - to approximately 92 Vac - the change will be felt on Pin 3 of Voltage Comparator 8D. The imbalance at the comparator results in a trigger signal sent to I.C. 3G / I (Pin 6). The output (Pin 5) is then felt as an input signal on the 6A decoder (Port I N37) which then forwards this in-port status change to the CPU. Upon receiving this particular in-port signal, the CPU shuts down operation and displays the appropriate "11" code and goes into TILT mode.



Line Voltage Sensing Circuitry (for component values, refer to main schematc)



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6. 3-REEL MACHINE EDGE CONNECTOR WIRING PINOUTS

A. EDGE CONNECTOR - 1



A. 3-REEL MACHINE EDGE CONNECTOR - 1 (Cont'd)

| (A) | 1st Reel Index | (B1) | CN16(1) | |
|--------------|---------------------------------|--------------|-----------|--------------------|
| (B) | 2nd Reel Index | (V) | CN17(1) | |
| (C) | 3rd Reel Index | (Gy) | CN 18(1) | |
| (D) | No Connections | | | |
| (E) | No Connections | | | |
| (F) | No Connections | | | |
| (H) | Hopper Function Switch | (B1) | CN25(7) | |
| (J) | Coin-Down Optic | (Gs/Bk) | CN7(I 1) | <i>CN</i> 10(2) |
| (K) | Downstroke Optic | (Sk) | CN28(1) | |
| (L) | Handle Unlock Optic | (V) | CN26(1) | |
| (M) | Handle Return Optic | (Gy) | CN27(1) | |
| (N) | Jackpot Reset Switch | (R) | CN21(1) | |
| (P) | No Connections | | | |
| (R) | No Connections | | | |
| (S) | No Connections | | | |
| (T) | 7-Segment Anode 105 | (R/Bk) | CN7(31) | - <i>CN</i> 15(6) |
| (U) | 7-Segment Anode 10 ⁴ | (Br/Bk) | CN7(30) · | - CN15(5) |
| (V) | 7-Segment Anode 103 | (Sk) | CN7(29) - | - CN 15(4) |
| (W) | 7-Segment Anode 102 | (Gs) | CN7(28) · | - CN15(3) |
| (X) | 7-Segment Cathode 'a | (Br) | CN7(19) - | CN 15(14) |
| (Y) | 7-Segment Cathode 'b | (R) | CN7(20) - | CN 15(15) |
| (Z) | 7-Segment Cathode 'c' | (Gs/Bk). | CN7(21) - | CN 15(16) |
| (a) | 7-Segment Cathode 'd | (Gn) | CN7(22) - | CN 15(17) |
| (b) | 7-Segment Cathode 'e' | (Bl) | CN7(23) - | CN 15(18) |
| (c) | 7-Segment Cathode 'f | (V) | CN7(24) - | CN 15(19) |
| (d) | 7-Segment Cathode 'g | (Gy) | CN7(25) · | - <i>CN</i> 15(20) |
| (e) | Jackpot Balance Electro- | | | |
| | Mechanical Meter | (0) | CN24(4) | |
| (f) | Speaker | (V/Bk) | CN23(2) | |

B. 3-REEL MACHINE EDGE CONNECTOR - 2

| | B. 5-REEL MACHINE EDGE CONNECTOR - 2 | | | | |
|------|---|---------------|--|--|--|
| | | | | | |
| | | | | | |
| Ĺ | | | | | |
| | A B C D E F H J K L | MNPRS | TUVWXYZabcale f | | |
| · · | | | | | |
| (1) | GND | (Bk) | CNI7(2), CN20(2), CN23(5), CN25(5) CN27(2), CN31(1) | | |
| (2) | GND | (Bk) | CN16(3), CN18(3), CN22(2), CN24(9) CN26(2), CN28(2) | | |
| (3) | 5 Vdc | (Pk) | CN16(2), CN18(2), CN25(4), CN27(3) | | |
| (4) | 5 Vdc | (Pk) | CN 17(2), CN26(3), CN28(3) | | |
| (5) | No Connections | | | | |
| (6) | Minimum Time Adj | (O r) | CN21(3) | | |
| (7) | No Connections | | | | |
| (8) | No Connections | | | | |
| (9) | Insert Coin Lamp | (Br) | CN7(16) - CN12(1) | | |
| (10) | Coin Accepted Lamp | (R) | CN7(17) - CN 12(3) | | |
| (11) | Collect Lamp | (Br) | CN41(9) - CN33(1) | | |
| (12) | No Connections | | | | |
| (13) | Bet 1 Lamp | (Y) | CN7(15) - CN39(2) | | |
| (14) | Tilt Lamp | (Gs) | CN7(18) - CN31(7) | | |
| (15) | Coin Lockout Coil | (BI) | CN7(12) - CN 10(5) CN39(3) | | |
| (16) | Diverter Solenoid | (V) | CN7(13) - CN1O(4) | | |
| (17) | Reel Motor 1-1 | (R) | CN 16(4) | | |
| (18) | Reel Motor 1-2 | (Y) | CN16(5) | | |
| (19) | Reel Motor 1-3 | (Sk) | CN16(6) | | |
| (20) | Reel Motor 1-4 | (Gs) | CN 16(7) | | |
| (21) | Reel Motor 2-I | (R) | CN17(4) | | |
| (22) | Reel Motor 2-2 | (Y) | CN 17(5) | | |
| (23) | Reel Motor 2-3 | (Sk) | CN 17(6) | | |
| (24) | Reel Motor 2-4 | (Gs) | CN 17(7) | | |
| (25) | Reel Motor 3-1 | (R) | CN18(4) | | |
| (26) | Reel Motor 3-2 | (Y) | CN 18(5) | | |
| (07) | | (01) | CN 10(C) | | |

(Continued on the next page)

CN 18(6)

CN 18(7)

(Sk)

(Gs)

(27)

(28)

Reel Motor 3-3

Reel Motor 3-4

Schematic Illustrations



7-20



12. RED HI-SPEED HOPPER DRIVE RELAY BOARD





16. PROGRESSIVE INTERFACE 8116-SUB P.C. BOARD



7-23

17. ELECTRONIC DOLLAR ACCEPTOR



Schematic Illustrations



_<u>7-25</u>

7-26





Schematic Illustrations



7-27

21. 3/4 -REEL MACHINE COMPOSITE EDGE CONNECTOR WIRING PINOUTS

Universal's latest Slot Machines have encompassed a modified wiring harness which allows for easy conversion from 3 to 4 and 4 to 3 reel games. There are 4 new connectors on the new harness. A white, 12-Pin Female which will be designated as CN45; a white 12-Pin Male connector as CN46; a red 12-Pin Female as CN47 and a red 6-Pin Female as CN48. The 2 red connectors will be used whenever a 4-reel game is used. CN46 is used for either game. For a 3-reel game, plug CN46 into CN45 and for a 4-reel game, plug CN46 into CN47. CN48 is used for the credit harness on the 4-reel version and plugs into CN33 whereas on a 3-reel game CN33 plugs into the credit harness coming from the Main Logic Board. The Edge Connectors have had some wiring changes as well and the wiring for them follows below.

A. EDGE CONNECTOR - 1

| (1) | Coin-Up Optic | (Sk/Bk) | CN7(10) CN 10(1) |
|-----------|-------------------------|-------------|------------------------------|
| (1) | Coin-to-Cash-Box Optic | · , | . CN7(9) - CN10(3) |
| (2) | Collect Switch (4-Reel) | (R) | CN48(2) - CN33(2) - CN41(10) |
| (4) | Change Switch | (P/Bk) | CN7(8) CN13(1) |
| (5) | Door Lock Key Switch | · / | .CN7(14) - CN11(1) |
| (6) | Service Switch | (R) | CN24(2) |
| (0) | Hopper Overflow Switch | | CN25(3) |
| (8) | Door Open Switch | (BI) | CN22(3) |
| (9) | Meter Reading Switch | (W) | CN20(1) |
| (10) | Test Switch | (Br) | CN24(1) |
| (10) | Reset Switch | (Pk) | CN22(1) |
| (11) | Coin Count Switch | (0) | CN25(2) |
| (12) | No Connections | (-) | × / |
| (14) | Hopper Motor Drive | (Br) | CN25(1) |
| (15) | Hopper Solenoid Drive | (Y) | CN25(6) |
| (16) | 7-Segment Anode 107 | (Y/Bk) | CN7(33) - CN15(8) |
| (17) | 7-Segment Anode 106 | (0/Bk) | CN7(32) - CN 15(7) |
| (18) | 7-Segment Anode 101 | (Pk) | CN7(27) - CN15(2) |
| (19) | 7-Segment Anode 100 | (W) | CN7(26) CN15 |
| (20) | No Connections | · / | |
| (23) (21) | No Connections | | |
| (22) | No Connections | | |
| (23) | No Connections | | |
| (24) | No Connections | | |
| (25) | No Connections | | |
| (26) | Hi-Speed Hopper | | |
| | Reverse Signal (4-Reel) | (Gn) | CN47(10) - CN46(10) CN25(11) |
| (27) | Max Bet Lamp | (Gy/Bk) | . CN7(34) - CN39(3) |
| (28) | Speaker | (BI/Bk) | CN23(I) |
| | - (C | ontinued of | n the next page) |
| | | | |

| Coin Track Fault Finding Guide | |
|---|---|
| * Inserted Coin is Returned | Coin accepting device inoperative Coin lockout coil defective or not in the proper position Microprocessor "sees" the door open |
| * Inserted coin is not credited | Coins are jammed inside coin track Coin accepting device is missing |
| * Error code '21' is displayed | Foreign object or coin blocking optic sensor Dirty optic sensor Faulty optic sensor (confirm operation with SELF-TEST 6 Coin passing time adjusted improperly Poor connection at CN-10 Poor optic solder joints Bad component on main logic board |
| * Inserted coin doesn't enter hopper | * Hopper overflow control in effect * Bad connection to probe (confirm with SELF-TEST 6) * Faulty diverter solenoid * Dirty / stuck deflector |
| * More than maximum coins are being accepted | Coins are jammed inside the accepting device Coin lockout coil action is being interfered with Program error |

| * No Handle Release | * Blown handle solenoid fuse (#5) * Faulty handle optic(s) (Check using SELF-TEST 6) |
|--|---|
| | * Bad handle solenoid |
| | (Check using SELF-TEST 7) |
| | * Bad handle relay |
| | (In the power supply) |
| * Handle released but cannot | * Trip Lever 'B' jammed in the |
| be pulled (mechanically obstructed) | up position |
| | * Broken Lock Lever end |
| | * Check for other possible |
| | mechanical obstructions |
| * Free Handle | * Handle solenoid constantly |
| | energized |
| | * Broken stop paddle on |
| | * Trip Lever 'A' |
| | * Jammed plunger link assembly |
| | Broken lock lever end pivot pin Defective handle relay in the |
| | * Defective handle relay in the power supply |
| Reels do not spin upon handle pull | * Defective handle optic (Use TEST 6) |
| ······································ | * Blown reel fuse (#6) |
| | * Poor contact at reel connector |

Reel Mechanism Fault Finding Guide

| * Reel Error Code 41 - 44 | Defective reel optic (Confirm with SELF-TEST 6) Poor contact at reel connector pins |
|---------------------------|--|
| | Defective reel motor Defective component on main logic board |
| | |

TroubleshootinE

| Hopper Overpay (31 Code) Standard Wide-body Cabinet | Count switch defective or out of adjustment Loose or shorted count switch wire Defective kicker assembly |
|--|--|
| Hopper Overpay Narrow or Intermediate Cabinet Type | * See above * Faulty fluorescent lamp or lamp driver unit |
| * Hopper Short pay | Count switch defective or out of adjustment Worn or otherwise defective kicker solenoid link bracket |
| * Coin out Jam (32 Code) | Count switch out of adjustment Warped coin disk Defective coin shifter |
| Hopper Empty (33 Code) (Assuming coins in the hopper) With coin disk turning | Count switch defective or out of adjustment Defective kicker solenoid Worn or defective kicker linkage Idle rotation of coin disk |
| Hopper Empty with motor energized but coin disk is not turning | Coins jammed at the knife Coin disk prevented from turning by foreign matter Broken bowl Warped coin disk Defective Gear head assembly Loose disk bushing |

| Lamp doesn't light | * Blown Fuse #6 |
|----------------------------------|--|
| | * Lamp burned out |
| | * Improper socket contact |
| Abnormal 7-Segment display | * Bad LED segment |
| | (Check with SELF-TEST 5) |
| | * Bad connector contact |
| | * Bad component on main logic board |
| | * Bad component on LED display |
| | board |
| * No sound or abnormal sound | * Sound volume not turned up |
| | * Blown fuse #4 |
| | * Defective speaker |
| | * Bad wiring or connector contacts |
| | * Sound EPROM missing from main |
| | logic board |
| | * Defective component on sound |
| | amplifier b oard or main logic board |
| * Electromagnetic counters do | * Blown fuse #6 |
| not increment | * Bad component on main logic board |
| | * Bad counter unit |
| Constant Error code '50' or '51' | * Defective door switch(es) |
| Constant Error code 50 or 51 | Door switch or door frame is |
| | out of adjustment |
| * DAMEDDOD '12' Code | * Temporary static 'shock' to main |
| * RAM ERROR '12' Code | |
| | logic board* Bad grounding throughout cabinet |
| | * 5 Vdc wire shorted to ground |
| | - |
| | * Defective component on main* logic board |

Troubleshooting

Miscellaneous Fault Finding Guide (continued) * Tower Lamp(s) not functioning * 4-Pin connector to tower unit is disconnected * Blown fuse #5 * Bad tower relay in power supply * Faulty component on main logic board * Power supply blowing fuses or * Faulty bridge rectifier improper voltage readings Faulty voltage regulator * Defective noise filter * Games locks up in a * DIP switches set improperly non-progressive situation (refer to Sections 5 and 8) * Games does not lock up when it should * Improper progressive signals sent to progressive controller * Game partial amount is incorrect * Check glass inserts

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7. 3 AND 4 REEL MECHANISM EXPLODED VIEW



8.5 REEL MECHANISM EXPLODED VIEW

9. REEL MECHANISM PARTS LIST

| | | 1 | ا |
|-------------|---------------------------|----------|------------|
| Item No. | Parts Name | Qʻty | Parts No. |
| 1 | Reel Wheel (A) | 3 | R515002 |
| | [3 Reel (4 Reel, 5 Reel)] | (4,5) | |
| 2 | Sleeve [3 Reel (5 Reel)] | 24 | R515003 |
| | | (20) | |
| | [4 Reel] | 16 | R515005 |
| 3 | Reel Strip | 3 | Refer to |
| | | (4,5) | Glass List |
| 4 | Reel Wheel (B) | 3 | R515001B |
| | [3 Reel (4 Reel, 5 Reel)] | (4,5) | |
| 5 | Motor [3 Reel] | 3 | E75562029 |
| | [4 Reel (5 Reel)] | 4(5) | E7553003 |
| 6 | Rubber Cushion | 3 | R815001 |
| | [3 Reel (4 Reel, 5 Reel)] | (4,5) | |
| 7 | Reel Brkt. | 3 | M115001 |
| | [3 Reel (4 Reel, 5 Reel)] | (4,5) | |
| 8 | Photo Sensor | 3 | A005001 |
| | [3 Reel (4 Reel, 5 Reel)] | (4,5) | |
| 9 | Photo Sensor Brkt. | 3 | M115007 |
| | [3 Reel (4 Reel, 5 Reel)] | (4,5) | |
| 10 | Wire Brkt. | 3 | M115008 |
| | [3 Reel (4 Reel, 5 Reel)] | (4,5) | |
| 12 | Reel Support (A) [3 Reel] | 1 | M1150043 |
| | [4 Reei] | 1 | M1150044 |
| | [5 Reel] | 1 | M1150045 |
| 13 | (B) [3 Reel] | 1 | M1150053 |
| | [4 Reel] | 1 | M1150054 |
| | [5 Reel] | 1 | M1150055 |
| 14 | (C) [3 Reel] | 1 | M1150063 |
| | [4 Reel] | 1 | M1150064 |
| | [5 Reel] | 1 | M1150065 |
| 15 | F.W. (M4) | | F31004 |
| 16 | Screw (M4x12) | | F140412 |
| 17 | (M4x8) | | F110408 |
| 18 | S.W. (M4) | | F32004 |
| | F.W. (M3) | L | F31003 |
| 20 | S.W. (M3) | | F32003 |
| 21 | Screw (M3x16) | | F110316 |
| 22 | Sleeve Joint | 12 | R515004 |
| | [3 Reel (4 Reel, 5 Reel)] | 116, | |
| | | 0) | |
| 23 | Nut (M4) | <u> </u> | F21004 |
| 25 | Center Bushing | 3 | M215001 |
| | [3 Reel (4 Reel, 5 Reel)] | (4,5) | |
| 26 | Screw (M5x10) | <u> </u> | F110510 |
| 27 | Side Cover [5 Reel] | 1 | M115009 |
| | [3 Reel (4 Reel)] | 1 | M115010 |
| 30 | Reel Assy. [3 Reel] | 3 | A005003 |
| | [4 Reei] | 4 | A005004 |
| | [5 Reel] | 5 | A005005 |
| 40 | Reel Unit [3 Reel] | 1 | A5003 |
| | [4 Reel] | 1 | A5004 |
| | [5 Reel] | 1 | A5005 |



10. CONTROL PANEL EXPLODED VIEW AND PARTS LIST

| No | Parts Name | Q'ty | Parts No. |
|----|-------------------------|------|------------|
| 1 | Cap (Rounded) | 1 | R520001 |
| | [Square] | 1 | R520002 |
| | [Rectangular] | 1 | R520003 |
| 2 | Lens [Rounded) | 1 | R510051 |
| | [Square] | 1 | R510057 |
| | [Rectangular] | 1 | R510060 |
| 3 | Spring Holder [Rounded] | 1 | R510052 |
| | [Square] | 1 | R510058 |
| | [Rectangular] | 1 | R510061 |
| 4 | Spring | 1 | F710001 |
| 5 | Frame [Rounded] | 1 | R510053 |
| | [Square] | 1 | R510058 |
| | [Rectangular] | 1 | R510062 |
| 6 | Spacer | 1 | R510054 |
| 7 | Nut | 1 | R510055 |
| 8 | Miniature Lamp 28V | 1 | E1402803 |
| 9 | Lamp Holder | 1 | R510056 |
| 10 | Micro Switch | | E650A23 |
| 16 | Decorated Plug | | M1140051 |
| 17 | Nut (M24) | | F21024 |
| 18 | Control panel | 1 | Refer to |
| | | | P5 Item 27 |

| ltem No. | Parts Name | Q'ty | Parts No. |
|-------------|-----------------------------|------|-----------|
| 19 | Button Insert | | |
| | [(R) "Change"] | 1 | R5201 |
| | "Collect"] | 1 | R520102 |
| | "Bet"] | 1 | R520103 |
| | "Bet 1"I | 1 | R520104 |
| | ("Bet 2"] | 1 | R520105 |
| | ["Bet 3"] | 1 | R520106 |
| | "Bet 4"] | 1 | R520107 |
| | ("Bet 51 | 1 | R520108 |
| | [(S) "1st Coin"] | 1 | R520201 |
| | ["2nd Coin"] | 1 | R520202 |
| | ("3rd Coin"] | 1 | R520203 |
| | "4th Coin"] | 1 | R520204 |
| | ["5th Coin"] | 1 | R520205 |
| | "Bet Max."] | 1 | R520210 |
| | "Bet 1"] | 1 | R520211 |
| | ("Bet 2"] | 1 | R520212 |
| | "Bet 3"] | 1 | R520213 |
| | "Bet 4"] | 1 | R520214 |
| | ("Bet 5"] | 1 | R520215 |
| | "Hold"] | 1 | R520220 |
| | "Hold/Cancel"] | 1 | R520221 |
| | [(R) "Collect/Credit Mode") | 1 | R520301 |

Parts Catalog

17. STANDARD HOPPER EXTERNAL PARTS LIST

| ltem No. | Parts Name | Q'ty | Parts No. |
|-------------|-------------------------|------|-----------|
| 1 | Rear Cover | 1 | M1160520 |
| 2 | Rear Support | 1 | M1160521 |
| 3 | Bowl Cover | 1 | M1160522 |
| 6 | Front Support | 1 | M1160523 |
| 8 | Terminal Washer (M3) | | F36003 |
| 9 | Screw (M4x8) | | F110408 |
| 10 | S.W. (M4) | | F32004 |
| 11 | F.W. (M4) | | F31004 |
| 12 | Tapping Screw (M3.1x10) | | F5103110 |
| 13 | Bowl End | 1 | M1260060 |
| 14 | Coin Shifter | 1 | M1260100 |
| 16 | Insulator | 1 | R616002 |
| 18 | Partition Panel | 1 | M1260070 |
| 19 | Tapping Screw (M4x10) | 4 | F5104010 |
| 20 | Plastic Collar (A) | 2 | R55004 |
| 21 | Nut (M4 Brass) | 2 | F21004B |
| 22 | S.W. (M4 Brass) | 2 | F32004B |
| 23 | F.W. (M4 Brass) | 2 | F31004B |
| 24 | Shute | 1 | M1260140 |
| 25 | Screw (M4x12 Brass) | 2 | F110412B |
| 26 | Terminal Washer (M4) | 2 | F36004 |
| 27 | Coin Level Sensor | 1 | M1160524 |
| 28 | Slider | 1 | M1260150 |
| 29 | Grommet (B) | 1 | R55005 |
| 30 | F.W. (M12) | 1 | F31012 |
| 31 | Grommet (C) | 1 | R55006 |
| 32 | F.W. (M5) | 1 | F31005 |
| 33 | Terminal Washer (M5) | 1 | F36005 |
| 34 | S.W. (M5) | 1 | F32005 |
| 35 | Nut (M5) | 1 | F21005 |
| 36 | Extention Panel | 1 | M1260160 |
| 37 | Shield Panel | 1 | M1160525 |



18. MINI (RED) HIGH SPEED HOPPER EXPLODED VIEW

| Item No. | Parts Name | Q'ty. | Parts No. |
|----------|----------------------------------|-------|-----------|
| 1 | Bucket Cover | 1 | MH045 |
| 2 | Hopper Bucket | 1 | MH001 |
| 3 | Coin Separator | 1 | MH041 |
| 4 | Partition Panel | 1 | MH048 |
| 5 | Buffle | 1 | MH014 |
| 6 | Separate Ring | 1 | MH016 |
| 7 | Buffle Shaft | 1 | MH031 |
| 8 | Turn Table | 1 | N310030 |
| 9 | Hopper Base | 1 | MH002 |
| 10 | Coin Guide Rail (US 10¢) | 1 | MH004 |
| | Coin Guide Rail (US 25¢, AU 10¢) | 1 | MH005 |
| | Coin Guide Rail (US 5¢) | 1 | MH006 |
| | Coin Guide Rail (AU 20¢) | 1 | MH007 |
| | Coin Guide Rail (AU 5¢) | 1 | MH008 |
| | Coin Guide Rail (US 50¢) | 1 | MH009 |
| 11 | Coin Guide Arm | 1 | MH023 |
| 12 | Coin Guide Bush | | MH032 |
| 13 | Cushion Rubber | 1 | MH030 |
| 14 | Spacer | 1 | MH033 |
| 15 | Flat Gear | 1 | MH028 |
| 16 | Out Roller Shaft | 1 | MH027 |
| 17 | Coin Out Roller | 1 | MH026 |
| 18 | Gear Case | 1 | MH042 |
| 19 | Film | 1 | MH022 |
| 20 | Motor | 1 | MH019 |
| 21 | Side Brkt. (L) | 1 | MH044 |
| 22 | Earth Terminal Brkt. | 1 | MH024 |
| 23 | Front Cover | 1 | MH020 |
| 24 | Front Panel | 1 | MH017 |
| 25 | Sensor Brkt. | 1 | MH010 |
| 26 | Photo Sensor | 1 | MH035A |
| 27 | Coin Chute | 1 | MH018 |
| 28 | Side Brkt. (R) | 1 | MH043 |
| 29 | Drive PCB | 1 | MH047A |
| 30 | Coin Level Sensor | 1 | MH049A |
| 31 | Hopper Base | 1 | MH013 |
| 32 | Сар | 1 | MH038 |
| 33 | Bearing | 1 | MH046 |
| 34 | Slide Switch Stopper | 1 | MH036 |

19. MINI (RED) HIGH SPEED HOPPER PARTS LIST

MINI HOPPER FASTENER

| Item No. | Parts | Name | Q'ty. | Item No. Parts Nam | | Name | Qty. |
|----------|------------|---------|-------|--------------------|---------|----------|------|
| F78 | 4*6 | TP | 2 | N23 | Nut | Brass | 2 |
| F41 | 4*12 | 3P | 4 | W12 | S.W. | Brass | 2 |
| F26 | 4*41 | 2P | 1 | W42 | F.W. | Brass | 2 |
| F42 | 4*14 | 3P | 6 | N24 | M5 Nut | Brass | 1 |
| F79 | 4*9 | TP | 7 | W13 | M5 S.W. | Brass | 1 |
| F44 | 4*18 | 3P | 3 | W43 | M5 F.W. | Brass | 1 |
| B8 | 4*10 | Brass | 2 | P12 | 3*6*16 | Roll Pin | 1 |
| G39 | 5*14 | Flat | 3 | | | | |
| E33 | 3*16 | 2P | 1 | | | | |
| E44 | 3*10 | 3P | 1 | | | | |
| T42 | 4*10 | Tapping | - 1 | | | | |
| E3 | 3*6 | TP | 4 | | | | |
| F30 | 4*30 | 2P | 3 | | | | |
| T27 | 3*8 (Flat) | Tapping | 1 | | | | |

20. SHADOW BOX ASSEMBLY EXPLODED VIEW AND PARTS LIST



| Item No. | Parts Name | Parts No. |
|----------|-----------------------|-----------|
| 1 . | Lamp Board | |
| 2 | Lamp PCB | |
| 3 | Lamp Socket | E9302000 |
| : 4 | Lamp | E1402403 |
| 5 | W. Screw (M3.1x6) | F5103106 |
| 6 | F.L Socket | E930110 |
| 7 | Fluorescent Tube | E150110 |
| 8 | W. Screw (M3.1x18) | F5103116 |
| 11 | W. Screw (M3.1x16) | F5103118 |
| 13 | Tapping Screw (M3x10) | F5103110 |
| 14 | Starter Socket | E930008 |
| 15 | Starter | E160115 |
| 16 | Ballast | E710110 |

29. SUGGESTED PARTS-ON-HAND LIST

The following list shows the various parts that have a tendency to wear excessively and / or which have a life expectancy of less than 12 months.

| DESCRIPTION | PART NO. | PRICE | DESCRIPTION | PART NO. | PRICE |
|-----------------|------------|-------|-------------------|-------------|-------|
| HANDLE M | IECHANISM | | HOPPER | ASSEMBLY | |
| Photo Sensor | A000012 | 5.70 | Gear Box | E7568P60 | 32.50 |
| Photo Sensor | A000015 | 5.70 | Bowl Bolt | F186004 | 1.50 |
| Photo Sensor | A000016 | 5.70 | Soft Bowl Spring | F716004 | 1.85 |
| Cotter Pin | F42028 | .04 | Hard Bowl Spring | F716001 | 1.25 |
| Cotter Pin | F42036 | .04 | Coin Runner | | |
| Pivot Pin 'A' | F447001 | .80 | 5c | M1160201 | 8.25 |
| Pivot Pin 'B' | F447002 | . 80 | lOc | M1160206 | 8.25 |
| Pivot Pin 'G' | F447008 | 1.25 | 25c | M1160202 | 8.25 |
| E-Ring | F61006 | .04 | 50c | M1160208 | 8.25 |
| Spring 'A' | F717001 | 1.25 | \$1.00 | M1160203 | 8.25 |
| Spring 'B' | F717002 | .50 | Coin Disk | | |
| Torsion Spring | F727001 | 1.25 | 5c | M1160301 | 25.25 |
| Lock Lever End | MI 170010 | 8.00 | lOc | M1160306 | 25.25 |
| Trip Lever 'A' | M1170015 | 4.50 | 25c | M1160302 | 25.25 |
| Slide Bracket | M1170018 | 3.20 | 50c | M1160308 | 25.25 |
| Trip Lever 'B' | M1170042 | 7.50 | \$1.00 | M1160303 | 25.25 |
| Plunger Link | M1170044 | 1.75 | \$5.00 | M1160304 | 48.00 |
| | | | \$25.00 | M 1160305 | 48.00 |
| | | | \$100.00 | M1160309 | 67.85 |
| COIN TRA | CK ASSEMBL | Y | | | |
| | | | Disk Bushing | M 1160501 | 10.00 |
| Lockout Coil | E714001 | 4.40 | Link | M1160514 | .75 |
| \$1.00 Acceptor | M1145206 | 56.50 | Coin Shifter | M1260100 | 2.75 |
| CC-16 Acceptor | M1145203 | 50.00 | Coin Bowl | R556006 | 23.00 |
| CC-30 Acceptor | M1145302 | 85.00 | | | |
| Coin Optic Pin | | | MISCELLA | NEOUS ITEMS | 5_ |
| Regular Size | M1140121 | .50 | | | |
| \$1.00 Size | M 1140122 | .60 | Mini 28V Lamp | E1402803 | . 70 |
| \$5.00 Size | M1140123 | .60 | Fluorescent Tubes | | |
| | | | 6W | E150106 | 2.50 |
| | | | 8W | E150108 | 3.40 |
| | | | low | E150110 | 3.40 |
| | | | 15W | E150115 | 3.40 |
| | | | Starter - 6,8,10W | E160008 | 1.25 |
| | | | Starter - 15, 30W | E160115 | 1.25 |
| | | | Door Switch | E6107930 | 8.25 |
| | | | Fuse - 3A | E17003 | .25 |
| | | | Tuse - JA | L1/00J | .45 |
| | | | Fuse - 4A | E17003 | .25 |

APPENDIX-A

TABLE OF SYMBOL CODE NO.

UNIVERSAL

| SYMBOL CODE NO. | MODEL NO. | MODEL NO. | MODEL NO. | MODEL NO. | MODEL NO. |
|--------------------|------------------|-----------|-----------|-----------|-----------|
| | 8224 | 8466 | 8471 | 8470 8520 | 8502 |
| | 8225 | 8469 | | 8474 8565 | 8503 |
| | 8426 | 8473 | | 8474 8472 | 8511 |
| | 8427 | 8566 | | 8501 | 8512 |
| 1 | 7 BAR | 7 | 3 BAR | 7 | 7 BAR |
| 2 | 3 BAR | 3 BAR | 2 BAR | 3 BAR | 3 BAR |
| 3 | 2 BAR | 2 BAR | 1 BAR | 2 BAR | 2 BAR |
| 4 | ¹ BAR | 1 BAR | MELON | 1 BAR | 1 BAR |
| 5 | BLANK | BLANK | BELL | CHERRY | BLANK |
| 6 | | | PLUM | BLANK | |
| 7 | | | ORANGE | | |
| 8 | | | CHERRY | | |

| SYMBOL CODE NO. | MODEL NO. | MODEL NO. | MODEL NO. | MODEL NO. |
|--------------------|-----------|-----------|--------------|------------|
| | 8467 | 8468 | 8504 8508 | 8505 |
| 1 | 7 | 7 | 7 BAR | 7 BAR |
| 2 | 11 | BAR | 5 BAR | 3 BAR |
| 3 | 8 | STAR | 1 BAR | 2 BAR |
| 4 | STAR | 8 | BLANK | 1 BAR |
| 5 | BAR | MELON | | CHERRY-BAR |
| 6 | MELON | BLANK | | BLANK |
| 7 | BLANK | | | |

| SYMBOL CODE NO. | MODEL NO. | MODEL NO. | MODEL NO. | MODEL NO. |
|--------------------|--------------|--------------|-----------|--------------|
| | 8506 8561 | 8515 8562 | 8517 | 8518 8563 |
| | 0001 | 0002 | | |
| 1 | 7 BAR | JOKERS-WILD | WILD-BAR | JOKERS-WILD |
| 2 | 5 BAR | 7 BAR | 7 | 7 BAR |
| 3 | 1 BAR | 3 BAR | MELON | 5 BAR |
| 4 | CHERRY-BAR | 2 BAR | BELL | 1 BAR |
| 5 | BLANK | 1 BAR | PLUM | BLANK |
| 6 | | BLANK | ORANGE | |
| 7 | | | BLANK | |

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| SYMBOL CODE NO. | MODEL NO. | MODEL NO. | MODEL NO. | MODEL NO. |
|--------------------|--------------|--------------|------------|------------|
| | 8514 8542 | 8543 8546 | 8544 | 8545 |
| 1 | WILD-BAR | WILD-BAR | WILD-BAR | WILD-BAR |
| 2 | 3 BAR | 5 BAR | 3 bar | 5 BAR |
| 3 | 2 BAR | 1 BAR | 2 BAR | 1 BAR |
| 4 | 1 BAR | BLANK | 1 BAR | CHERRY-BAR |
| 5 | BLANK | | CHERRY-BAR | BLANK |
| 6 | | | BLANK | |
| 7 | | | | |

| SYMBOL CODE NO. | MODEL NO. | MODEL NO. | MODEL NO. | MODEL NO. |
|--------------------|-----------|-----------|------------------|-----------|
| | 8554 | 8556 | 8557 | 8558 |
| 1 | DOUBLE | DOUBLE | DOUBLE | DOUBLE |
| 2 | 7 | 7 | 7 BAR | 7 BAR |
| 3 | 3 BAR | 3 BAR | 5 BAR | 5 BAR |
| 4 | 2 BAR | 2 BAR | ¹ BAR | 1 BAR |
| 5 | 1 BAR | 1 BAR | CHERRY-BAR | BLANK |
| 6 | BLANK | CHERRY | BLANK | |
| & | | BLANK | | |

| SYMBOL CODE NO. | MODEL NO. | MODEL NO. | MODEL NO. | MODEL NO. |
|--------------------|------------|-----------|-----------|------------|
| | 8550 | 8551 | 8567 | 8568 |
| 1 | 7 BAR | 7 | 7 BAR | 7 |
| 2 | MELON-BAR | 3 | BAR | CHERRY-BAR |
| 3 | BELL-BAR | 2 | BELL | BELL |
| 4 | PLUM-BAR | 1 | PLUM | PLUM |
| 5 | ORANGE-BAR | BLANK | ORANGE | ORANGE |
| 6 | CHERRY-BAR | | CHERRY | |
| 7 | BLANK | | | |