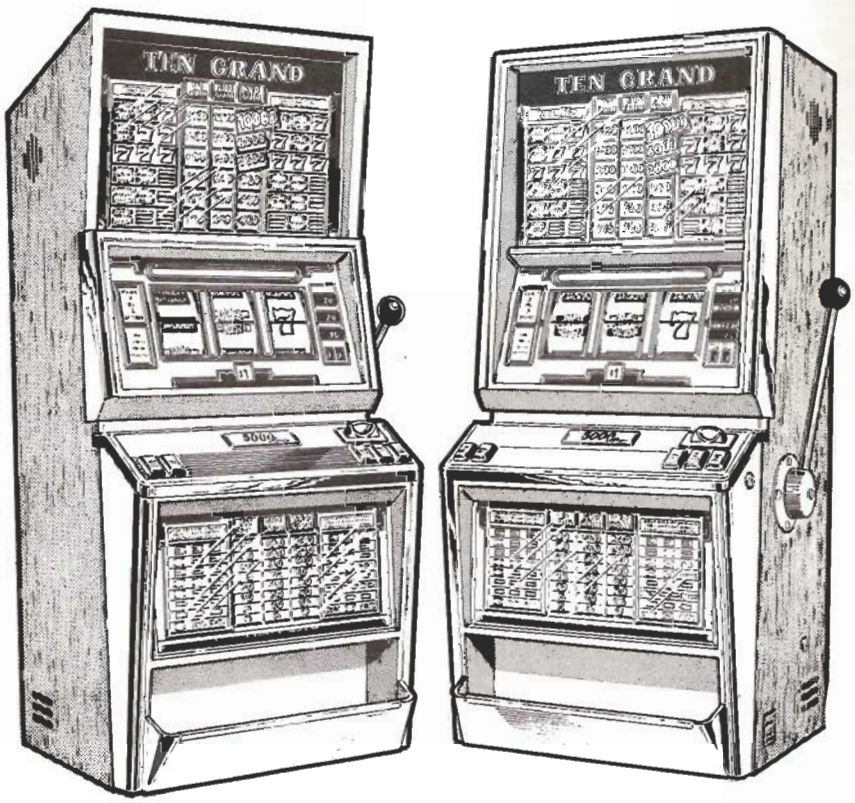
Bally 5000 Plus



OPERATOR INSTRUCTIONS MANUAL

Bally

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Introduction

— WARNING —
Do not plug machine into power source and turn the power on until you have read sections 1 and 2

Note: The word "user(s)" is defined in this manual as any person, partnership, company, or corporation, and/or their legal representatives, who own, operate, service, maintain, and derive profit from their association with this equipment. The word "player" is defined in this manual as any person who deposits money, tokens, or their equivalents into the machine described in this manual for the purpose of playing the game offered by the machine as defined by the rules and odds set by the machine's user(s).

Purpose

This manual contains complete information on the ***Bally*** 5000 Plus Slot Machine (*Figure* 1-1). It is written for the users, whether they are set-up personnel, owners, or service technicians. By following each section's step-by-step procedures, the user can easily and quickly get the 5000 Plus Slot Machine ready for play.

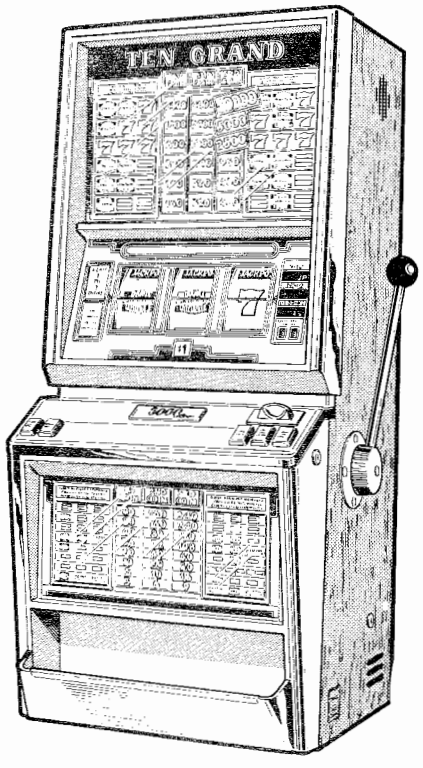


Figure 1-1. 5000 Plus Slot Machine

The 5000 Plus Slot Machine

Some of the features of the 5000 Plus Slot Machine are: trim cabinet design, ribbon cable for internal wiring, stepping motor-driven reels, and light-emitting diode (LED) display center. The LED display center provides information about the current game, diagnostic tests, tilts, bookkeeping meters, and the keypad option settings. The special use of solid-state microcomputer electronics and software achieves the degree of security, integrity and reliabilty required by the modern-day gaming industry.

Organization

This manual is designed in a squential order as follows:

Section 1	Introduction
Section 2	Location and Set-up
	Inspection before power-up
	Adjustments, initialization, and testing after power-up
Secton 3	Game operations, meters, and win records
Section 4	Troubleshooting
Section 5	Maintenance and Repair
Section 6	Appendices
	Glossary
	Index

There are important **WARNING** and **CAUTION** statements contained throughout this text. To ensure the safety of the user and prevent damage to system components, all such statements *must* be followed exactly.

The detailed **Table of Contents**, **List of Illustrations**, and **List of Tables** are quick references to specific information for the user. Within this manual, "call a senior service technician" appears where additional expertise is needed.

Please refer to the **Glossary** when uncertain of any terminology.

Help

For any questions, please contact your ***Bally*** distributor, or refer to the service information number in the front of this manual on page ii.

Location and Set Up

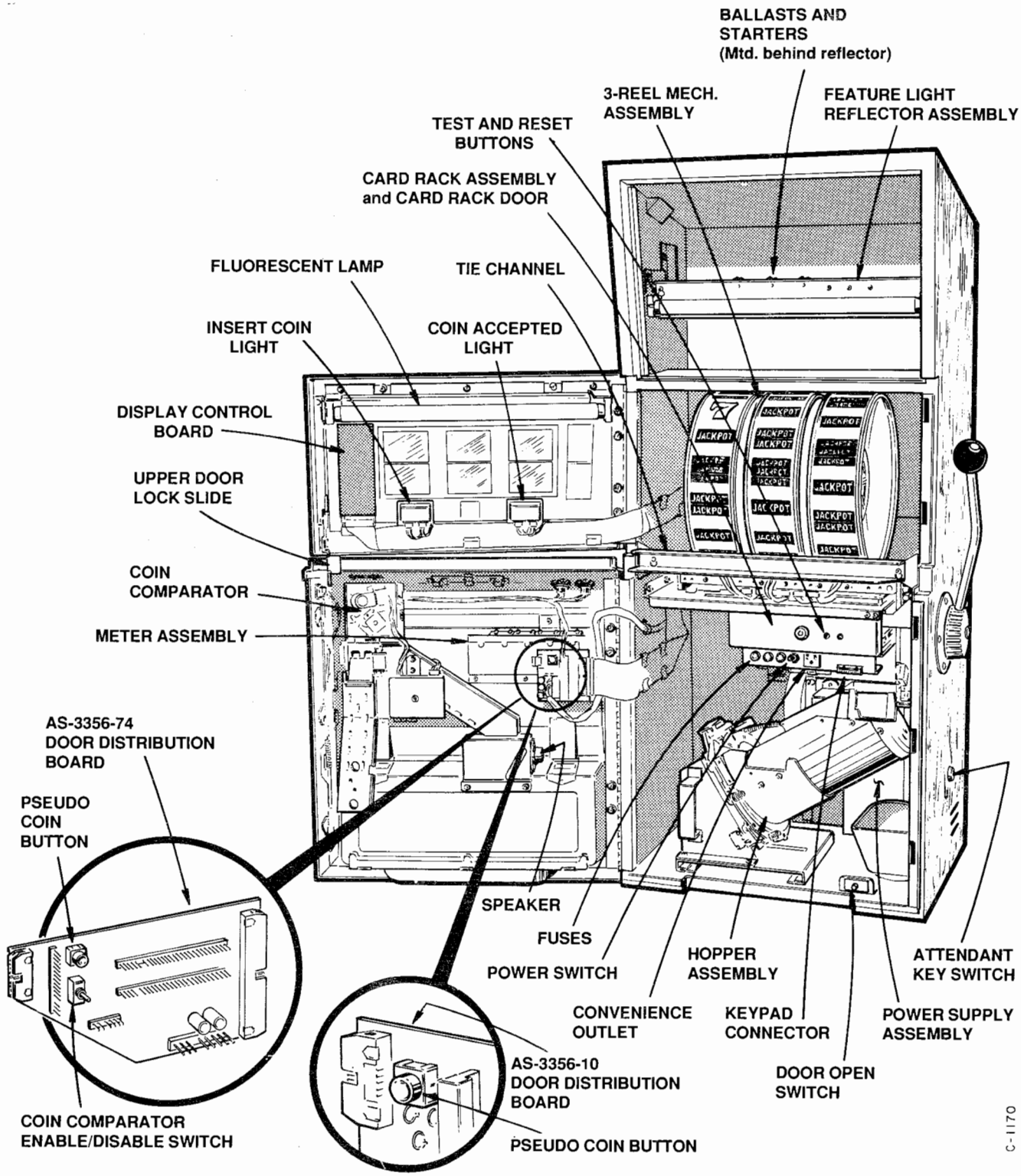


Figure 2-1. Component Identification Diagram

TABLE 2-1. MACHINE MODEL NUMBER BREAKDOWN TABLE
Sample model #: S33L3X-MBO

POSITION	DESCRIPTION	OPTIONS	DESCRIPTION
S	Machine Type	S	Electronic Slot
3	Series Number	3 4 5	Standard reels and slots Variably spaced stops Maxi reels
3	Maximum number of coins/game	0 More than 9	If specialty Written description required.
L	Game Type	B L M U	Option buy Line pay Multiplier Undefined: Written description required.
3	Number of reels		
X XA indicates Contemporary style cabinet; XT indicates Traditional style cabinet	Cabinet Size	1 2 3 4 5 6 7 8	Low boy narrow Low boy wide Chop top narrow Chop top wide Casino top narrow Casino top wide High boy narrow High boy wide
MBO	Code for type of winning symbol combination.		Use 0-9 and/or A-Z

Inspect Before Power-up

When inspecting the ***Bally*** 5000 Plus Slot Machine, follow these steps:

1. Carefully unpack and remove all parts.

2. Inspect all components for any apparent damage.

3. Check the packing list to be certain that all components have arrived.

4. Remove the shipping cleats from the bottom of the cabinet.

5. Open the lower and upper doors:
   Turn the door keyswitch.
   Pull the lower door open.
   Push up on the lock slide handle at the bottom right of the upper door.
   Pull the upper door open. (See *figure 2-1.*)

6. Check that the power cord is properly routed out of the machine.

> **— CAUTION —**
> **Discharge body static to avoid any internal damage to the components.**

7. Plug in any connectors found loose. If the connectors will not go on easily and the keys are aligned, the either do not belong there or are damaged.

> **— CAUTION —**
>
> **Do not force plugs into connectors. do not force plugs together. All connectors and plugs are keyed to go together only when all pins are properly aligned.**

8. Verify that all printed circuit boards (PCBs) are firmly seated in their connectors.

9. Check all sub-assemblies and verify that they are securely mounted.

10. Remove the packing from the reels. Check that all reels spin properly. If the reels are not spinning freely, check for the cause (foreign matter, cables, etc.).

Inspect Before Power-up *(continued)*

11. Empty the hopper of any packing materials and any other contents.

12. If new locks are installed, check that no wires are pinched causing short circuits.

    NOTE: If you need to install locks, see **Lock Installation** in Appendix 5 at the end of this manual.

13. Check that the handle is not loose or damaged. To replace the handle, see Section 5, **Maintenance And Repair** under **Replace Handle.**

> — WARNING —
> **Do not allow this machine to be operated by players if the handle is loose, bent, cracked, or otherwise damaged or weakened. Injury to players may occur if user(s) allow a machine with a damaged or weakened handle to remain in service.**

14. List all problems that you cannot correct. Contact the nearest ***Bally*** distributor for help in making any claim against the shipper on in obtaining replacement parts.

NOTE: The coin comparator enable/disable switch on AS-3356-74 door distribution board will allow an inoperable game to remain lit and "on" while locking out coins.

Environmental Requirements

Game power: 110 to 120 VAC @ 50/60 Hz

Power supply input: 97 to 132 VAC (nominal 115 VAC) @ 44/440 Hz
Power supply output: +5 VDC, +12 VDC, -12 VDC, +24 VDC

Average current draw: 1.1 Amps
Maximum current draw: 1.5 Amps

Maximum number of machines on a 20 Amp circuit: Eight (8)

— WARNING —
Plug machine into a grounded circuit.

Minimum ambient temperature: 40° F. (4° C)
Maximum ambient temperature: 100° F. (38° C)

Maximum relative humidity 90%

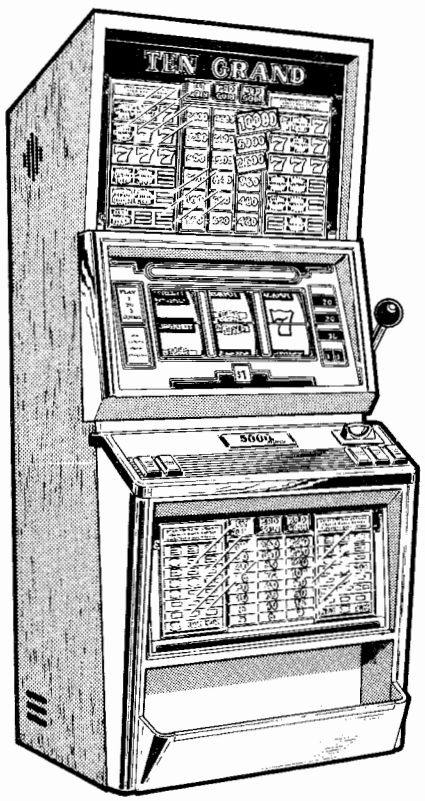
Average heat from machine: 450 BTUs

Space required (depth x height):
Minimum: 18.75" x 17.75" (47.625cm x 45.085cm)
Maximum: 18.75" x 20.25" (47.625cm x 51.435cm)

Machine height:

Low Boy	33.25" (84.455cm)
Chop Top	41.00" (104.14cm)
Casino Top	46.00" (116.84cm)
High Boy	52.00" (132.08cm)

MINIMUM spacing between machines: 6.5" (16.51cm)



— WARNING —
The spacing dimensions contained in this manual are *minimums*. To prevent possible player injury, machines must be spaced no closer than listed.

Power-up

Follow these steps to power-up the machine:

1. Plug the machine into the grounded power source. The convenience outlet is active.
2. Flip the power switch "ON." A vital functions self-test occurs on the microprocessing unit (MPU) board. The LED display center displays either "82" or "52" in the two left digits of the WIN meter. (See **Door Open Operation** in this section.)
3. Close and lock the door to check that the machine has powered up correctly.
4. Turn the keyswitch on the right side of the machine. A reset will occur and the machine goes into the game over state. The LED display will clear.

Note: If a malfunction occurs, see Section 4, **Troubleshooting** under **Power-up Malfunctions.**

5. Take the machine's meter readings for your records. See Section 3, **Machine Operations.**

TABLE 2-2. EXCEPTION CODES

During game power-up, operation, and game play, various codes (shown below) will appear on the WIN meter to represent game status or tilt conditions.

CODE	DESCRIPTION	CODE	DESCRIPTION
20	Coin-in jam	47	Reel 3 illegal movement
21	Coin-in inappropriate	48	Reel 4 illegal movement
24	Coin-in reverse	49	Reel 5 illegal movement
31	Payout jam	50	Door open
32	Payout empty	51	Door unlocked
33	Payout overpay	52	Door hinge open
34	Payout reset	53	Door open during spin
40	Reel 1 error	80	ROM error
41	Reel 2 error	81	Low battery voltage
42	Reel 3 error	82	Door open/power down
43	Reel 4 error	83	SafeRAM error
44	Reel 5 error	84	RAM error
45	Reel 1 illegal movement	90	Message center failure
46	Reel 2 illegal movement	99	Lockup for attendant pay

Door Open Operation

The following is a list of messages and conditions that exist when the machine door is open.

1. When the door is unlocked and open "52" appears in the left 2 digits of the **WIN** meter. The **CREDIT** meter displays "0" if the game is optioned for credit play, otherwise the meter is blank. After closing the door, the actual credit total displays normally.
2. A sound, if optioned, occurs and repeats at frequent intervals. The lower portion of the tower light turns on.
3. Coins are locked out when the lower door is detected unlocked.
4. Coins are not dispensed from the machine, except during the hopper test. (See **Diagnostic Tests** under **Test #4** in this section.)
5. The automatic spin option does not function.
6. The deck buttons do not function.
7. The bookkeeping meters do not increment with the door open, except during diagnostic test #2.
8. If the door is open during a payout, the **WIN** meter displays "50" to indicate the door is open. The payout will continue after the door is closed.

Pseudo Coin Game

The pseudo coin game allows game play with the door open. By pressing the pseudo coin button, the machine operates as if a coin was inserted or a credit was played. During pseudo coin game play, the machine feature glass and many machine functions can be checked, for example, the handle mechanism and the paylight sequence. The conditions in **Door Open Operation,** above, apply to the pseudo coin game. To use the pseudo coin game, follow these steps:

Important: Any pseudo coining remaining when the machine door is closed and locked are *valid coins in,* except in New Jersey where any pseudo coins remaining will be cleared when the door is closed.

1. Unlock and open the lower door.
2. Press the pseudo coin button on the door distribution printed circuit board to coin a game. (See *Figure 2-1* for button location.)

Adjust Electronic Coin Comparator

The electronic coin comparator consists of the coin comparator and the electronics package. The coin comparator compares the sample coin or token with each inserted coin or token. This requires sensitivity adjustments for proper operation. Appendix 6 contains complete information and specifications regarding the coin comparator.

Adjust Hopper Counterbalance

The hopper counterbalance must be adjusted to set the hopper for a desired capacity of coins. To do this, refer to *figure 2-2* and follow these steps:

1. Fill the hopper with the desired level of coins.

2. Turn the set screw clockwise until the actuator of the microswitch is in the up position.

3. Turn the set screw counterclockwise very gradually until the microswitch clicks down. The hopper is now set at the desired capacity.

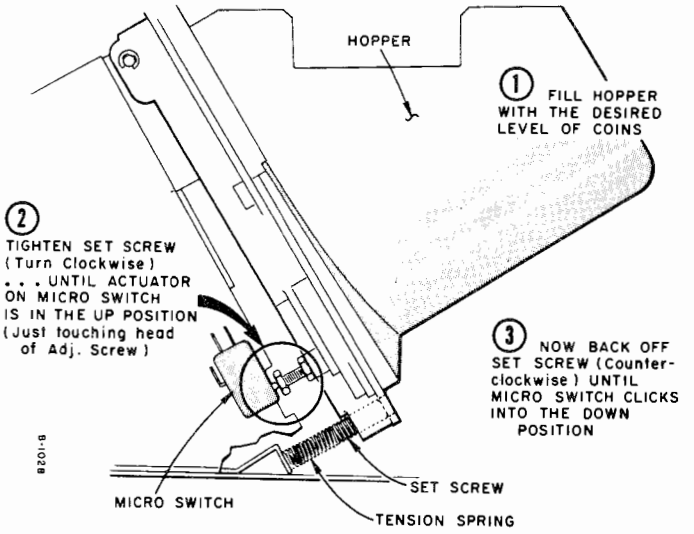


Figure 2-2. Adjust Hopper Counterbalance

Adjust Volume

Turn the potentiometer located on the backplane above C13 to adjust the volume. (See *figure 2-3.*)

NOTE: See the **Keypad Command/Option Table** in this section if there is no sound.

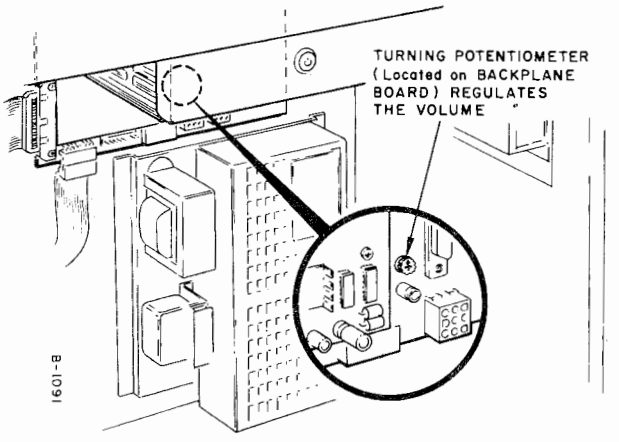


Figure 2-3. Adjust Volume

Diagnostic Tests

Enter Diagnostic Tests

1. Open the door when the machine is in a game over or tilt state.
2. Press the MPU board "TEST" button the number of times corresponding to the test number desired. For example, for test #2, press the "TEST" button twice; for test #3 press it three times, etc. See **DIAGNOSTIC TESTS** in this section for the tests and numbers. Pressing the "TEST" button at any time immediately (1) advances to the next test, or (2) cycles back to the first test if in the last test (test #10). Sequencing through the test numbers allows any test to be entered in any order.
3. Press the "CHANGE/SERVICE" button at the end of any diagnostic test to restart the test.

Exit Diagnostic Tests

Press the "RESET" button *(figure 2-1)* or close and lock the door to exit the diagnostic tests at any time. The machine returns to the game over or tilt state.

LED Display During Diagnostic Testing

During diagnostic testing, the LED displays the test number in the left two digits of the **WIN** meter (e.g., 01, 02). A "d" displays in the **LAST IN** meter to indicate diagnostic testing mode. The **COIN IN** meter is blank, except in test 10. The **CREDITS** meter is blank. The status of each test displays in the **PAID** meter as described below.

Test #1 - Game Identification

The **PAID** meter displays the personality identification number, the strap, the nominal percentage followed by the basic percentage. These values alternate with blanks in the meter. For example, if the personality is E0062A5X-43, the strap is 01-00, the nominal percentage is 96.49%, and the basic percentage is 95.59, then the PAID meter will display the following in sequence, alternating with blanks: 0062 0100 96.49* '95.59*
*Values may not display on all games.

Test #2 - Output

The machine cycles through each out-going signal, turning one output "ON" for one second while displaying the signal name, port, and toggling the bit. The status displays in the **PAID** meter the Port #, the bit position, a blank, then status (reading left to right). See below. To stop this test at any time, press and hold the "PSEUDO COIN" button. Release it to continued.

2	4		1

represents: port 2, bit position 4, Status is "1".
(The bit should toggle between "1" and "0".)

Diagnostic Tests *(continued)*

Test #3 - Input

As any incoming signal (input) is manually activated and operating properly, for example, a button is pressed or the handle is pulled, the bit toggles. A normally closed switch must be opened before the port and bit appear. The machine cycles through each incoming signal, turning one output "ON" for one second while displaying the signal name, port, and toggling the bit. The status displays in the **PAID** meter the Port #, the bit position, a blank, then status (reading left to right). For example:

2	4		1

represents: port 2, bit position 4, Status is "1"
(The bit should toggle between "1" and "0".)

Test #4 - Hopper

The hopper dispenses 10 coins, updating the display as each coin is paid. If an overpay problem occurs, the display continues to increment and the hopper continues to dispense coins. If a tilt occurs, the tests stops. The **PAID** meter displays the type of tilt in the two left digits. The two right-most digits display the amount paid. For example:

3	2	1	0

represents: hopper jam, 10 coins paid out.

3	1	0	5

represents: hopper empty, 5 coins paid out.

Test #5 - Reel Function

The reels spin and stop automatically at each position. The spin/stop sequence continues until the test is exited. The two right digits of the **WIN** meter displays the reel # if a bad spin occurred. Otherwise, this meter is blank. The rightmost two digits of the **PAID** meter indicates the number of bad or good spins that occurred. For example:

0	5		3

showing in the **WIN** meter indicates that reel 3 had *bad* spin(s).

			2

showing in the **PAID** meter indicates there were 2 bad spins.

If the rightmost digit of the **WIN** meter displays a blank and the **PAID** meter displays a value in the right two digits, then that value represents the number of good spins.

Test #6 - Reel Tape

The right two digits of the **PAID** meter show the stop number for the reels as they cycle through all stop positions. See the example on the following page.

Diagnostic Tests *(continued)*

		3	1

indicates reel stop positon 31.

To stop this test at any point, press and hold the "PSEUDO COIN" button. Release it to continue.

Test #7 - Reel Tilt Record

The right two digits of the **WIN** meter show which tilt is being tested. The PAID meter shows the total times the tilt occurred for all reels. For example:

0	7		1

showing in the **WIN** meter indicates that tilt #1 is being tested.

		2	0

showing in the **PAID** meter indicates that the tilt occurred 20 times total for *all* reels. Table 2-3, below, lists the tilts by number.

TABLE 2-3. REEL TILT CODES

TILT	DESCRIPTION
1	Missed end of stop position.
2	Reels moving incorrectly.
3	Stopped off the center bit.
4	Accelerating improperly.
5	Running improperly.
6	Decelerating improperly.
7	Reels in wrong position.
8	Missed start of stop position.

Actuate the keyswitch to see the meters in the REEL METER RECORD TABLE (Table 2-4, below). The meters increment with each occurrence in actual game play and in diagnostic test #5. The meters can only be reset to zero by clearing SafeRAM.

TABLE 2-4. REEL METER RECORD TABLE

METER	DESCRIPTION
Stop off center bit	The reel stopped on the correct position, but the position is not within the center of the stop. This does not result in a tilt.
Acceleration Running Deceleration	The center of a stop position is not read within the designated steps while the reels are accelerating, running, or decelerating.
Wrong Position	A wrong position is read.
Miss start of stop	The position to begin the stopping of the reel is not read.

Diagnostic Tests *(continued)*

Test #8 - Communications

Upon entering this test, it first automatically tests for shorts. The rightmost two digits of the **WIN** meter show "1" for shorts. If the **PAID** meter shows "S" in the left digit when testing for shorts, a short occurred.

The second part of this test is for loopback. Plug the loopback (BALLY part no. E-664-294) into each port on the backplane board (see below) to test for good communications. The test will cycle through each port and display the status in the **PAID** meter. If a "P" appears in the left digit while testing for loopback, the test passed. Blanks mean the test failed.

PORT	PLUG
3	J25
1	J24
2	J23
0	J22

Test #9 - Display (series 500 or later programs)

All meters flash, alternating between blanks and turning all LED segments on.

Test #10 - Payout Test (series 500 or later programs)

The payout test must update the **WIN** and **PAID** meters before and after the "SPIN" button is pressed. Place the reels in the combination being tested before beginning the test.

Start of Payout Test. The **PAID** meter shows decimal points to indicate the reels are in the center position for each symbol. Blanks show that they are off center. For 4-reel (or fewer reel) games, the leftmost digit of the **PAID** meter represents reel #1. Reading from left to right, the next digit represents reel #2, etc. In a 5-reel game, the rightmost digit of the **WIN** meter represents reel #1, and, reading from left to right, the leftmost digit of the **PAID** meter represents reel #2, and so on across.

The **COIN IN** meter is blank. Then, after the "PSEUDO COIN" button is pressed, the **COIN IN** meter increments from 1 until the maximum coinage is reached, or until releasing the button.

After the "SPIN" Button is Pressed. The **PAID** meter alternates between win and paid amounts for the set reel configuration. A win over 5 digits displays as "JP". The **COIN IN** meter and decimal points remain as above.

Initialize Options

The keypad for the System 5000 slot machines initialized options for the available commands. See the **Keypad Command/Option Table** and **Descriptions and Examples of Options** in this section.

NOTE: Check the machine's display glass with the options set.

To initialize an option, see *figure 2-4* and follow these steps:

1. The machine must be in the game over state.
2. The credit meter must show "0" credits with the door closed.
3. Open the lower machine door. Connect the keypad to the connector located on the fuse/power bracket below the card rack.
4. Press the "KEYBD/CLR" key on keypad.

   An "A" displays in the **LAST IN** meter on the LED display center.
6. Press the numbers corresponding to the command desired. The command and its number appear on the LED display. The **WIN** meter shows the command number in the leftmost two digits. The **PAID** meter indicates the option number. The display scrolls to the left for each digit displayed. (If more than 4 digits are entered, only the last 4 will display. The **COIN IN** and **CREDITS** meters are blank. The "COIN ACCEPTED" and "INSERT COIN" lamps are turned off.

   If there is an error in the option setting, "E" occurs in the **WIN** meter. If credits exist for a credit game, "Ec" occurs in the **WIN** display when someone attempts to change any of the option settings.
7. Press the "ENTER" key.
8. Continue by pressing the numbers for the next command.

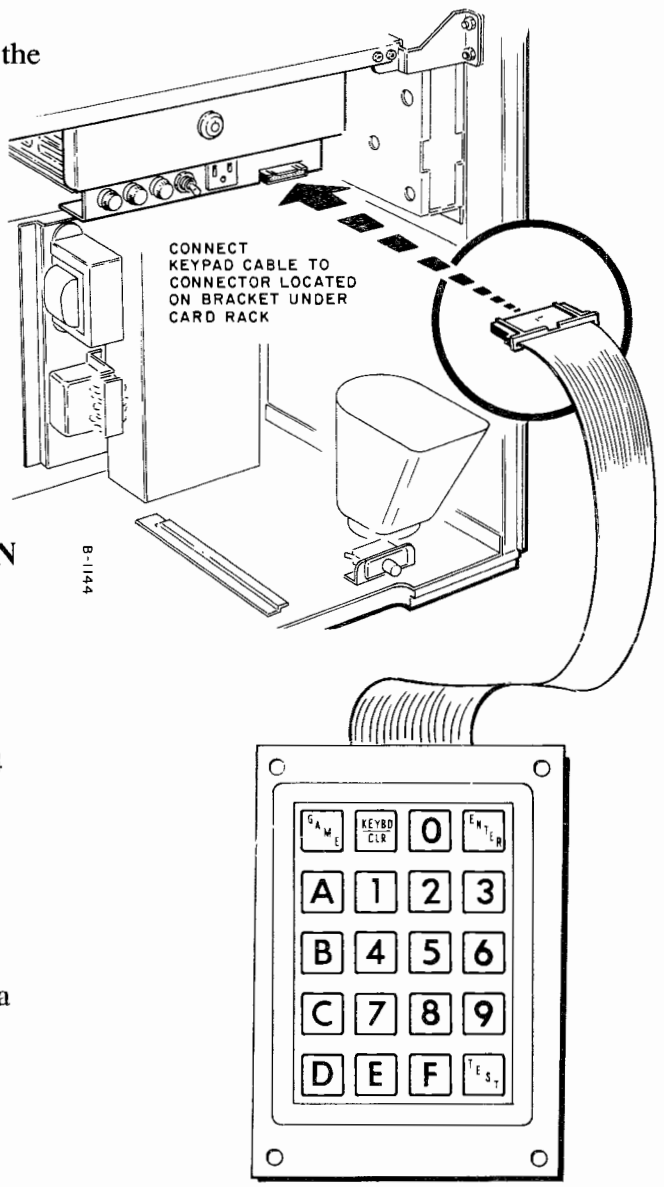


Figure 2-4. Initialize Keypad Options

Verify Options

To verify the options set, follow these steps:

1. The machine must be in the game over state.
2. The credit meter may or may not show credits.
3. Open the machine door. Connect the keypad to the backplane PCB.
4. Press "KEYBD/CLR" key.
5. Press the number for the desired command.
6. Press the "ENTER" key. The present option setting appears in the **PAID** meter. If an error occurs in the opiton setting, an "E" displays in the leftmost position of the WIN meter.

   If credits show on the **CREDITS** meter when the option setting is being changed, "Ec" displays in the left two digits of the **WIN** meter and the option is unchanged. Options cannot be set while credits show on the **CREDITS** meter.
7. If a change is required, follow the steps in **Initialize Options**, in this section.

To return to game over state, remove the keypad and then close and lock the door. Table 2-5, below, describes errors that can occur with the keypad use and how to correct them.

Table 2-5. KEYPAD ERRORS

Description	Procedure
Command number entered is not a valid command.	Press "KEYBD/CLR" to begin again
The length (number of digits) of the option is either too long or too short.	Press "KEYBD/CLR" to begin again
The option number entered is not valid for that particular command.	Press "KEYBD/CLR" to begin again
The option value entered is not a number.	Press "KEYBD/CLR" to begin again
The machine must be in the game over state.	Play a game to put machine in the game over state.
The credit meter must show "0" credits to set an option.	Clear the credit meter by pressing the "COLLECT CREDITS" button.
Keypad not connected correctly.	Reverse the keypad connector.

Commands and Options

The options that are set through the keypad are listed numerically in Table 2-6, below. At the end of this section is Table 2-7, which describes each command and option in detail, separated into sections: Non-credit, Credit, and Other.

TABLE 2-6. NUMERICAL ORDER COMMAND/OPTION TABLE

Cmd. No.	Command	Cmd. No.	Command
00	Simple/Deluxe Sound	40	Hopper payout Sound
01	Tournament Timer	41	Attendant Sound
02	Preogressive Type	42	Lockup Sound
04 *	Even Hand Pay	43	Super Jackpot Sound
05 *	Extra Coin Option	44	Door Open Sound
06	Coin Lockout/Credit	45	Tilt Sound
07	# of Handpay Lockups	49 *	Reel Backup
09 *	Jackpot Bell	50	Set I.D.
10 *	Coin Denomination	51	Credit Top Limit
11 *	Change Coin/Credit	52 *	Coin Lockout/Credit
12	Auto Hold (Hold & Draw)	54	High Drop Amount
13 *	Partial Collect	55	Low Drop Amount
16	Miser Type	56	High Drop Amount
18	Jackpot 4 Signals	57	Low Lockup Amount
27	Credit Type	58	Collect Drop Amount
29	Reel 1 Spin	59	Collect Lockup
30	Subsequent Reel Spin	62	New Jersey Tournament Kitty
32	Autospin	63	Progressive Reset (French)
34	Credit Game Lockup	64	Progressive Reset (French)
35	Coin In Sound	70	Payline Sequence
36	Max Coin In Sound	78	Machine Number
37	Reel Spin Sound	79	Clear SafeRAM
38 *	Reel Stop Sound	81	Set Real Time Clock
39	Credit Payout Sound	82	Paylight Sequence
		83	Partial Meter Return

* These options apply only to 500 Series or later programs.

Descriptions and Examples of Options

Option 27 - Credit Type (02 Player Selectable Credit)

When the machine is in a game over state with no credits showing on the meter, press the "COLLECT CREDITS" button to select a non-credit or standard credit game.

The game becomes a non-credit game when (1) the machine has no credits on the meter and has not been played for 30 seconds, or (2) the "COLLECT CREDITS" button is pressed to collect credits.

Option 34 - Credit Game Lockup

When the sum of the win amount and **CREDITS** meter amount is equal to or greater than the credit top limit, the lockup and drop amounts apply, leaving the **CREDITS** meter unchanged.

Example 1: The credit top limit is set at 5000. The **CREDITS** meter registers 4980. A 50-coin win occurs. The hopper pays 50 coins. The CREDITS meter stays at 4980.

Example 2: The credit top limit is set at 5000. The **CREDITS** meter registers 4980. The high lockup amount is set a 500 and the high drop amount is set at 200. A 500-coin win occurs. The hopper drops 200 coins and the machine locks up. The **CREDITS** meter stays at 4980.

Options 54 - High Drop Amount, 55 - High Lockup Amount, 56 - Low Drop Amount, and 57 - Low Lockup Amount

Example 1: The jackpot on the machine is 1000 coins. A drop of 200 is desired for the jackpot. For wins over 200 and less than the jackpot, a drop of 100 is desired. To do this:

Set the HIGH DROP AMOUNT at 200
Set the HIGH LOCKUP AMOUNT at 1000
Set the LOW DROP AMOUNT at 100
Set the LOW LOCKUP AMOUNT at 201

Example 2: The jackpot on the machine is 1,000,000 coins. No drop is desired for the jackpot. For wins over 200 and less than the jackpot, a drop of 100 coins is desired. To do this:

Set the HIGH DROP AMOUNT at 0 (zero)
Set the HIGH LOCKUP AMOUNT at 9999
Set the LOW DROP AMOUNT at 100
Set the LOW LOCKUP AMOUNT at 201

TABLE 2-7. KEYPAD COMMAND/OPTION TABLE			
CMD. NO.	COMMAND	OPTION NO.	DESCRIPTION
		NON-CREDIT GAME	
07	# of Handpay Lockups		Able to lock up 1 to 5 jackpots as defined by the personality.
		00	No lockups (default)
		01	One lockup
		02	Two lockups
		03	Three lockups
		04	Four lockups
		05	Five lockups
			NOTE: Used with stand-alone or link progressive.
56	High Lockup Amount	0000 to 9999	Number of coins for a machine lockup when a win equals or exceed this high lockup number. The High Drop Amount is paid from the hopper.
		0800	Default setting is 800 coins.
54	High Drop Amount	0000 to 9999	Number of coins paid from the hopper on High Lockup.
		0400	Default setting is 400 coins.
57	Low Lockup Amount	0000 to 9999	Number of coins for a machine lockup when a win equals or exceeds this low lockp number. The Low Drop Amount is paid from the hopper.
		0400	Default seting is 400 coins.
55	Low Drop Amount	0000 to 9999	Number of coins paid from the hopper on Low Lockup.
		0200	Default setting is 200 coins.
NOTE TO #54 through #57 ABOVE: If only 1 lockup and 1 drop amount are desired, set the low and high lockups at the same number and both drop amounts to match. For a further explanation of options, see **Descriptions and Examples of Options** on the previous page.			
26	Rebet	00	(Default) No rebet
		01	Rebets the last wager if "SPIN" button is pressed before a new wager or coin is inserted in a credit game.

TABLE 2-7. KEYPAD COMMAND/OPTION TABLE			
CMD. NO.	COMMAND	OPTION NO.	DESCRIPTION
		CREDIT GAME	
27	Credit Type	00 01 02	Non-credit (Default) Standard credit Player-selectable credit
06	Coin Lockout/ Credit	00 01	(Default) Coins locked out only when maximum coins in. Coins locked out when credits on credit meter. (300 Vers.)
51	Credit Top Limit	0000 to 9999 9999	Maximum number of credits to register on the credit meter. Default setting is 9999.
34	Credit Game Lockup	00 01	(Default) All wins are paid to the credit meter. All wins are paid to the credit meter *unless* the win is high enough to be subject to the high and low lockup and drop amounts (options 54-57). **NOTE:** When the win amount added to the credit meter is equal to or greater than the credit top limit, the lockup and drop amounts apply leaving the credit meter unchanged.
59	Collect Lockup	0000 to 9999 0400	Number of coins for credit meter to equal or exceed, which locks up the machine when "COLLECT CREDITS" is pressed. Collect Drop Amount is paid from the hopper. Default setting is 400 coins.
58	Collect Drop Amount	0000 to 9999 0400	Number of coins paid from the hopper on Collect Lockup. Default setting is 400 coins.
81	Set Real Time Clock	123456 789012	Initializes the real time clock in the machine. The sequence of digits are: 1 and 2 = month — 3 and 4 = day 5 and 6 = year — 7 and 8 = hour 9 and 0 = minute — 1 and 2 = second **NOTE:** When verifying this option, the time does not update on the message center (LED display).

TABLE 2-7. KEYPAD COMMAND/OPTION TABLE

CMD. NO.	COMMAND	OPTION NO.	DESCRIPTION
50	Set I.D.	0000 to 9999 0000	The identification number for the machine. Consider a floor plan when assigning a number. Default setting is 0000.
16	Miser Type		***300 Version Only*** / ***All Others*** 00 (Default) Miser III / No Miser 01 Miser II / Miser III 02 No Miser / Miser II **NOTE:** After setting option and before putting machine in game play, press "RESET" button to initialize this option.
82	Paylight Sequence	01234 56789	(Default) Standard paylight sequence. For changes: 0 = center payline light / 1 = top payline light 2 = bottom payline light / 3 = 4th payline light 4 = 5th payline light / 5 = 6th payline light 6 = 7th payline light / 7 = 8th payline light 8 = 9th payline light / 9 = 10th payline light
83	Partial Meter Return	0000000 000000 138AT	(Default) All 13 bookkeeping meters are sent for retrieval. 1. Enter the corresponding number (letter) of the bookkeeping meter(s) to be retrieved. See Section 3, **Machine Operations** under **Bookkeeping Meter Table.** 2. Press "TEST" on the keypad, then press "ENTER". 1 = Coin in / A = Super Jackpot 2 = Total in / B = Door open 3 = Coin out / C = Games since door closed 4 = Total out / D = Games since reset 5 = Total games 6 = Coin drop 7 = Credit 8 = Attendant pay 9 = Hand Pay **NOTE:** This option is for use with the SMS-5000. It does not affect the bookkeeping meters shown on the screen.

TABLE 2-7. KEYPAD COMMAND/OPTION TABLE

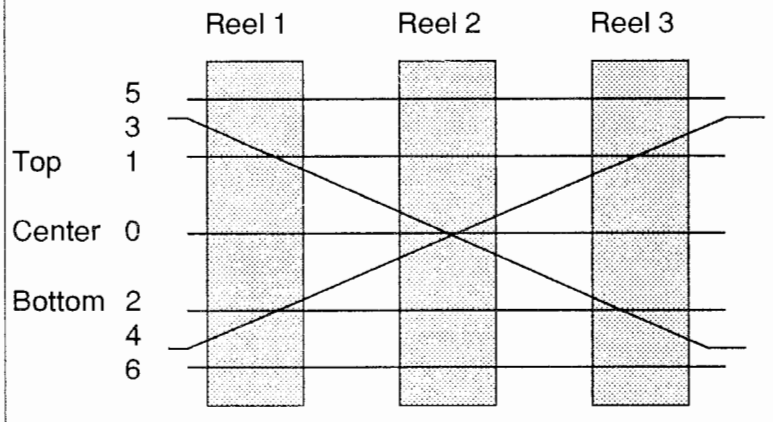
CMD. NO.	COMMAND	OPTION NO.	DESCRIPTION
70	Payline Sequence		In a line pay game, each coin buys a payline.
		0123 4567	Default option setting is the following - sequence for a standard payline game: 01234567
		0216 3457	Default option setting - Sequence for a two or four payline game: 02163457
		xxxx xxxx	Any other payline sequence can be optioned: Format: xxxxxxxx.
			
00	Simple Sound	00	Default setting is simple sound. Deluxe sound not available.
35 36 37	Coin In Sound Max coin in Sound Reel Spin Sound		**NOTE:** Presently, all 3 sound options have the same melody.
		00 01 02 03	(Default) Sound 1 Sound 2 Sound 3 Sound Off
38	Reel Stop Sound	00 01 02 03 04	(Default) Sound 1 Sound 2 Diverter click Handle click Dedicated solenoid click

TABLE 2-7. KEYPAD COMMAND/OPTION TABLE

CMD. NO.	COMMAND	OPTION NO.	DESCRIPTION
39	Credit Payout Sound		
40	Hopper Pay-out Sound		
		00	(Default) Sound 1
		01	Sound 2
		02	Sound 3
		03	Sound 4
		04	Sound 5
		05	Not used in S-5000
		06	Sound off
	Sounds:		**NOTE:** Presently all 6 sound options have the same melody. **NOTE:** In New Jersey, the super jackpot sound cannot be disabled.
41	Attendant	00	(Default) Sound 1
42	Lockup	01	Sound 2
43	Super Jsckpot	02	Sound 3
44	Door Open	03	Sound 4
45	Tilt	04	Sound 5
		05	Sound 6
		06	Sound off
32	Auto Start	00	(Default) No automatic start.
		01	Game automatically starts when door is closd and the maximum coins (credits) are inserted or wagered.
29	Reel 1 Spin		Number of revolutions the first reel spins before stopping. (300 or 500 Series) (600 Series)
		00	1.0-2.0 rev. (default) *0.5 rev. (default)
		01	1.5-2.5 rev. 1.0-2.0 rev. (NJ default)
		02	2.0-3.0 rev. 1.5-2.5 rev.
		03	2.5-3.5 rev. 2.0-3.0 rev.
		04	3.0-4.0 rev. 2.5-3.5 rev.
			*opt. 00 above, disabled in NJ.
30	Subsequent Reel Spin		Number of revolutions for remaining reels.
		00	(Default) 0.0-1.0 revolutions
		01	0.5-1.5 revolutions
		02	1.0-2.0 revolutions
		03	1.5-2.5 revolutions
		04	2.0-3.0 revolutions

TABLE 2-7. KEYPAD COMMAND/OPTION TABLE			
CMD. NO.	COMMAND	OPTION NO.	DESCRIPTION
NOTE: The Following options apply only on *400 Series* or later programs.			
04	Even Hand Pay		On any hand pay win, hopper pays the odd amount before locking up with a hand pay divisible by 10, 100 or 1000.
		00	(Default) No even hand pay.
		01	Even hand pay by 10s.
		02	Even hand pay by 100s.
		03	Even hand pay by 1000s.
			Example: A win of 10,924 with the high lockup set to 10,000 and the high drop set to 500, will drop: 500 if even handpay option is 00 504 if even handpay option is 01 524 if even handpay option is 02 924 if even handpay option is 03
05	Extra Coin	00	(Default) At the end of the current game, extra coin is credited to the next game.
		01	At the end of the current game, the coin is credited to the credit meter only on a credit game.
09	Jackpot Bell	00	(Default) No Bell
		01	Bell rings on all wins.
		02	Rings on wins of 20 or more credits.
		03	Rings on wins of 50 or more credits.
		04	Rings on wins of 100 or more credits.
		05	Rings on wins of 200 or more credits.
		06	Lockup
10	Coin Denomination		Set this option to match the machine coin denomination.
		00	(Default) $25. The bill changer accepts no bills.
		01	$5.00
		02	$1.00
		03	.50
		04	.25
		05	.10
		06	.05
		07	.01

TABLE 2-7. KEYPAD COMMAND/OPTION TABLE			
CMD. NO.	COMMAND	OPTION NO.	DESCRIPTION
NOTE: The Following options apply only on *400 Series* or later programs.			
11	Bill Acceptor	00 01	(Default) Change paid from hopper. Change paid to credit meter. **NOTE:** For non-credit games, all change is paid from the hopper. In New Jersey, the 01 setting cannot be set.
49	Reel Back-up	00 01	(Default) No backup of reels. Reel backs up until full handle pull.
52	Coin Lockout/ Credit	0000 0001 to 9999	(Default) Coins are accepted with any number of credits on the credit meter. Minimum number of credits appearing on the credit meter to lock out coins. **Note**: This command replaces command 06 in the 300 series program.
13	Partial Collect	00 01 02 03	(Default) No Partial collect. Pay all credits. Partial collect of 50 credits. Partial collect of 100 credits. Partial collect of 200 credits. **EXAMPLE:** With 210 credits on the meter and command 13 set to option 02, press "COLLECT" and 10 coins are paid. Press "COLLECT" again and 100 coins are paid. Press "COLLECT" again to dispense final 100 coins.
80	Jackpot Test Enable	xxxxxx	Type in date. Enables jackpot signal to be sent to progressive when in Diagnostic Test #10. **NOTE:** This option clears when the door is locked.
18	Jackpot 4 Signals	00 01 02 03	(Default) Jackpot signals 2 and 3. Jackpot signals 1 and 2. Jackpot signals 1 and 3. Jackpot signals 1, 2, and 3.

TABLE 2-7. KEYPAD COMMAND/OPTION TABLE			
CMD. NO.	COMMAND	OPTION NO.	DESCRIPTION
		Other Options	
01	Tournament Timer	01-60	Number of minutes.
02	Progressive Type	00 01 02	(Default) Non-serial Serial link Serial stand-alone
12	Auto Hold for Hold and Draw Game	00 01	No autohold. Holds a winning reel combination.
62	N. J. Tournament Kitty	0000 to 9999 0000	Amount to increment handpay meter on a progressive jackpot. Option is in units of 100. Default setting is 0000.
78	Machine Number		ID used in serial transmission. Ranges from: 00000000 to 99999999.
79	NJ Clear Safe-RAM	*	Clears SafeRAM. *Requires password.

TABLE 2-8. KEYPAD COMMAND/OPTION TABLE DEFAULT SETTINGS			
CMD. #	COMMAND	DEFAULT OPTION	
NON-CREDIT GAME			
07	# Handpay Lockups	00	No lockups.
56	High Lockup Amount	0800	800 coins
54	High Drop Amount	0400	400 coins.
57	Low Lockup Amount	0400	400 Coins
55	Low Drop Amount	0200	200 Coins
26	Rebet	00	No Rebet
CREDIT GAME			
27	Credit Type	00	Non-credit
06	Coin Lockout/Credit	00	Coins locked out only when maximum coins in.
51	Credit Top Limit	9999	Max. no. of credits to register on credit meter.
34	Credit Game Lockup	00	All wins paid to credit meter.
59	Collect Lockup	0400	400 Coins
58	Collect Drop Amount	0400	400 Coins paid from hopper on Collect Lockup.
50	Set I.D.	0000	
16	Miser Type	Miser III on 300 Version Only. No Miser on all other vers.	
82	Paylight Sequency	0123456789	
83	Partial Meter Return	0000000000000 - All meters sent.	
70	Payline Sequence	01234567 - Sequence for standard payline game.	
00	Simple Sound	00	Simple sound
35	Coin In Sound	00	Sound 1
36	Max Coin In Sound	00	Sound 1
37	Reel Spin Sound	00	Sound 1
38	Reel Stop Sound	00	Sound 1
39	Credit Payout Sound	00	Sound 1
40	Hopper Payout Sound	00	Sound 1

TABLE 2-8. KEYPAD COMMAND/OPTION TABLE DEFAULT SETTINGS			
CMD. #	COMMAND	DEFAULT OPTION	
41	Attendant Sound	00	Sound 1
42	Lockup Sound	00	Sound 1
43	Super Jackpot Sound	00	Sound 1
44	Dppr Open Sound	00	Sound 1
45	Tilt Sound	00	Sound 1
32	Auto Start	00	No automatic start
29	Reel 1 Spin	1.0-2.0 revolutions (New Jersey, and series 300 or 500); 0.5 revolutions (series 600).	
30	Subsequent Reel Spin	0.0-1.0 revolutions.	
400 SERIES OR LATER PROGRAM			
04	Even Hand Pay	00	No even hand pay.
05	Extra Coin	00	Credited to next game.
09	Jackpot Bell	00	No Bell
10	Coin Denomination	00	$25. Bill changer accepts no bills.
11	Bill Acceptor	00	Paid from hopper.
49	Reel Back-up	00	No backup of reels.
52	Coin Lockout/Credit	0000	Coins accepted with any # of credits on meter.
13	Partial Collect	00	No partial collect. Pay all credits.
80	Jackpot Test Enable	xxxxxx	Type in date.
18	Jackpot 4 Signals	00	Jackpot signals 2 and 3
OTHER OPTIONS			
01	Tournament Timer	01-60	Number of minutes.
02	Progressive Type	00	Non-serial.
12	Auto Hold (Hold & Draw)	00	No Autohold.
62	NJ Tournament Kitty	0000	
78	Machine Number	ID used in serial transmission.	

Machine Operations

Game Play - Non-Credit

LED meters, showing game status, are located on the right side of the reel glass. In the game over state the "INSERT COIN" lamp flashes. The **CREDITS** meter is blank for non-credit game play.

Begin Game Play

To play the game, insert a coin or token. (The sounds vary according to the initialized options.) Additional coins may be inserted up to the limit accepted by the machine. When the coin is accepted, the **COIN IN** meter increments with each coin, up to 5, then all buttons are off. (See *fig. 3-1).* The "COIN ACCEPTED" lamp is steady on.

NOTE: If 1 more coin than the maximum is accepted, it registers on the coin in counter. The extra coin is held until the current game is completed. After the completion of the current game, the extra coin is credited to either the next game or to the credit meter, depending upon the options set.

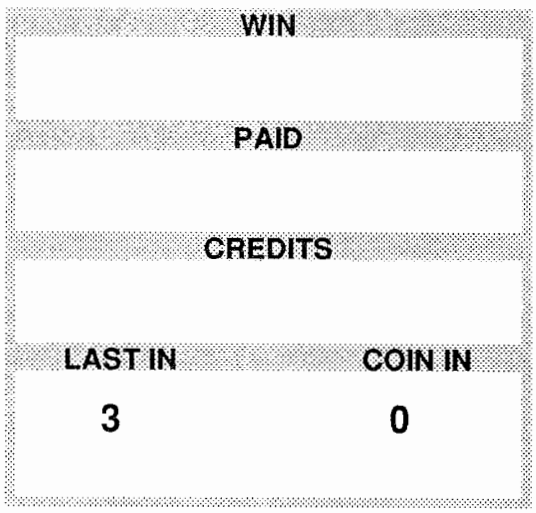


Figure 3-1. LED Display

Reel Spin and Win

After inserting coin(s), either pull the handle or press the lighted "SPIN" button. A reel spin may be initiated any time after 1 coin is accepted. The autospin option causes the reels to spin automatically on maximum coins in with the door closed. When the handle reaches its limit of travel, the reels begin to spin. When the reels stop, the **LAST IN** meter increments to show the number of coins inserted for the prior game. The **COIN IN** meter shows "0". *(Figure 3-2)*

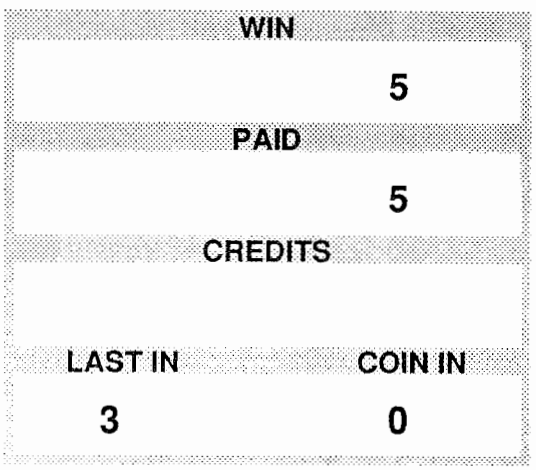


Figure 3-2. LED Display - Win 5 Coins

Game Play - Non-Credit *(continued)*

After spinning for an appropriate period of time, the reels are stopped in sequence, left to right. The number of revolutions of the reel varies with the initialized options. When a winning combination appears on a valid payline, the hopper dispenses the coins. The melody varies with initialized options. The "INSERT COIN" lamp flashes. The LED display indicates the win and increments the payout as the hopper dispenses coins. For example, if one coin was inserted and the winning combination was 5 coins, the LED display would appear as shown in *figure 3-2* after the hopper paid the win.

WIN - Jackpot

When the top jackpot is won, the upper portion of the tower light turns on. The jackpot melody played varies with initialized options. The machine is initialized to either immediately lockup or make a partial payment (drop amount) before locking up. For an immediate lockup, the LED display shows "JP" in the **WIN** meter. The **COIN IN** meter shows how many coins were played. The **PAID** meter is blank. (See *figure 3-3*).

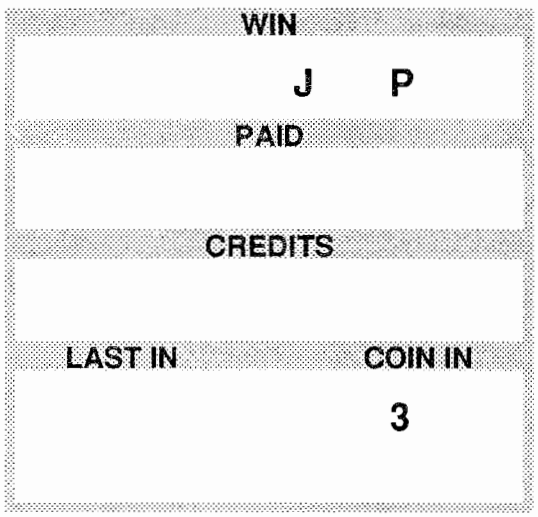


Figure 3-3. LED Display - Win Jackpot

For a partial payment on a 1000 coin jackpot, the hopper pays 200 coins. The LED display will indicate this by showing "200" in the PAID meter. The other meters display as shown in *figure 3-3* for jackpot win.

The slot attendant hand-pays the amount due the player and actuates the keyswitch on the machine's side to clear the jackpot. The machine is now ready for game play. At this point the LED display shows "JP" in the **PAID** meter instead of "200". (See *figure 3-4.)*

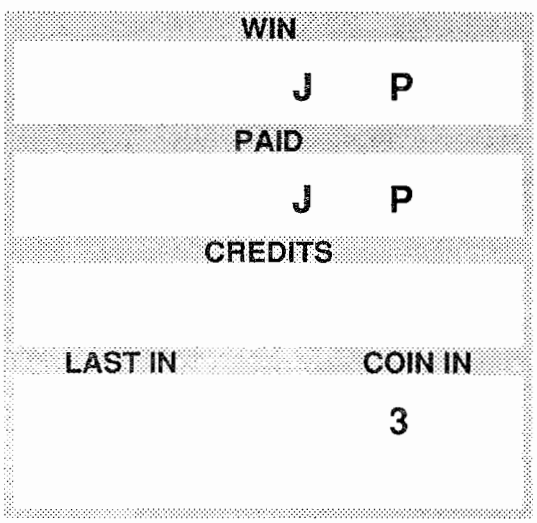


Figure 3-4. LED Display - Jackpot Paid

Change or Assistance Needs

To call for change or assistance, press the "PRESS FOR SERVICE" button. If the game is operational, it may be played while waiting. The upper portion of the tower light and "SERVICE" button flash until the button is pressed again. The sounds vary with the initialized options.

Game Play - Non-Credit *(continued)*

Verify Jackpot

Before paying and clearing a jackpot, determine whether it is legal. To verify a legal jackpot, check for the following events:

1. The upper portion of the tower light is on.
2. The LED display center displays as in figure 3-4.
3. A jackpot melody plays.

After clearing the jackpot by turning the keyswitch, winning jackpots can be verified by viewing the last game information. (See Last and Previous Game meters in this section.) If any of the above events are missing, call a service technician.

Game Play - Credit

To select the type of credit play and credit game lockup. See Section 2, **Location and Set Up** under **Keypad Command/Option Table.**

In the game over state, the "PLAY ONE CREDIT" and "PLAY MAX CREDITS" buttons flash when credits are available. Available credits display in the **CREDITS** meter on the LED display. The "COLLECT CREDITS" button is on, allowing the player to be paid from the hopper the amount of credits showing on the meter. *Figure 3-5* shows a sample LED display for player in the game over state with 42 credits accumulated.

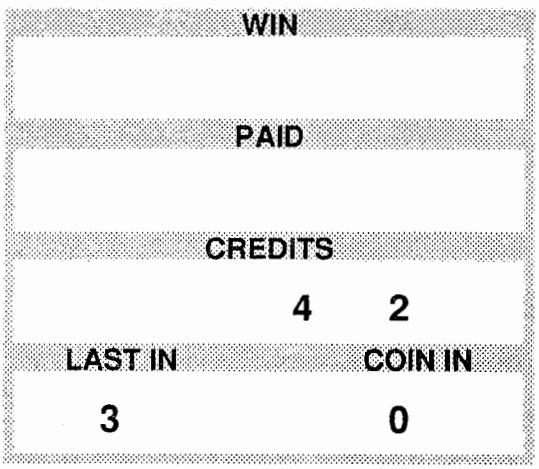


Figure 3-5. LED Display - Credit Game

Begin Game Play

The player can wager a coin or token only when one of the two following conditions are met:

1. The credit meter has no credits.
2. The acceptance of coins with credits available is set in the initialization.

When a coin or credit is wagered, the "COLLECT CREDITS" button turns off. The credit is deducted from the **CREDITS** meter and added to the **COIN IN** meter for that game. When the maximum number of credits or coins are wagered, both the "play credits" buttons turn off. The "INSERT COIN" lamp turns off. The LED display shows the number of remaining credits, the number of coins inserted in the last game, and the number of coins in this game. (See *figure 3-5*.)

Game Play - Credit (*continued*)

Reel Spin and Win

The player can initiate reel spin any time after one coin or credit is wagered. The initialized options determine how wins are paid or credited. When the win amount added to the amount already showing on the **CREDITS** meter is equal to or greater than the credit top limit, the lockup and drop amounts apply leaving the **CREDITS** meter unchanged.

Example 1: The Credit Top Limit is set at 5000. The **CREDITS** meter registers 4980. A 50-coin win occurs. The hopper pays 50 coins. The **CREDITS** meter remains at 4980.

Example 2: The Credit Top Limit is set at 5000. The **CREDITS** meter registers 4980. The High Lockup Amount is set at 500 and the High Drop Amount is set at 200. A 500 coin win occurs. The hopper drops 200 coins and the machine locks up. The **CREDITS** meter remains at 4980.

Collect Credits

To collect the credit meter winnings, press the "COLLECT CREDITS" button when the machine is in a game over state. If the credit meter is equal to or exceeds the Collect Lockup, the machine is initialized to (1) lock up immediately, or (2) make a partial payment (Collect Drop Amount) before locking up for an attendant pay. The upper portion of the tower light turns on. The slot attendant hand pays the amount due the player and actuates the key switch to clear the credit meter. **NOTE:** As in non-credit game play, verify jackpot wins (page 3-3).

Mars Bill Acceptor

The MARS unit uses two LEDs (red and green) to indicate its status to the player. When ready to accept bills, the green LED lights. The green LED goes out when a bill is accepted . When the bill clears the opto-detector in the bottom of the transport, the green LED lights again. If the opto-detector in the transport does not detect the passage of the bill within a certain length of time, or if the bill passes in front of the detector, but does not clear it, the red LED lights to indicate that the bill has jammed. See Section 5, **Maintenance And Repair** under **Clear Bill Acceptor and Transport** for instructions on clearing a jammed bill. **NOTE:** Bills are not accepted if: (1) 20 or more credits are on the credit meter; or (2) the coin denomination is optioned at "00".

When the bill is accepted, the LED display center shows the following: the **WIN** meter is cleared. As the **WIN** meter is cleared, the **PAID** meter displays the change amount. The CREDITS meter is incremented if the proper options are set, otherwise it is blank. The **LAST IN** and **COIN IN** meters remain the same as prior to the bill acceptance. The "COIN ACCEPTED" lamp is off and the "INSERT COIN" lamp is on.

Bookkeeping Meters

The bookkeeping meters account for all valid wagers and wins on a machine. These meters increment from 1 to 999,999, then rollover to begin at zero. They cannot be reset through a machine function. Coins are locked out when reading these meters. With the machine in a game over state, actuate the key switch on the machine's side to view these meters. To return to the game, turn the keywsitch. Table 3-1, below, describes each bookkeeping meter. *Figure 3-6* on page 3-6, indicates how the bookkeeping meters are shown in the LED display center.

Table 3-1. Bookkeeping Meters

METER	DESCRIPTION
COIN IN	Records each coin/token inserted into the machine for the purpose of a valid wager.
TOTAL IN	Records total valid wagers, both coins/tokens and credits.
COIN OUT	Records each coin/token dispensed from the hopper.
TOTAL OUT	Records the total number of coins/tokens dispensed by the hopper and all credits wagered.
TOTAL GAMES	Records the total number of game cycles executed by the machine with the door closed. It is incremented at the start of the reel spin.
DROP	Records each coin/token from a valid wager that falls to the drop box below the machine.
ATTENDANT PAYS	Records the total number of times an attendant has made a payout. It is incremented after the payout when the attendant resets the machine.
HAND PAID	Records the total number of hand paid wins, including those paid on a credit meter reset. The top jackpot amount (Super Jackpot) is included when command 07 (# of Handpay Lockups) is set at option 00.
SUPER JACKPOT	Records the number of highest attainable jackpot (Super Jackpot) lockup wins when command 07 (# of Handpay Lockups) is set at option 01, 02, or 03.
DOOR OPENS	Records the number of times the front door of the machine is opened. It increments once each time the door status changes from closed to open.
GAMES SINCE DOOR OPEN	Records the number of games played since a reset. (Power up or press "RESET" button.)
GAMES SINCE RESET	Records the number of games played since a reset. (Power up or press "RESET" button.)
CREDIT METER	Records the number of credits the player has on the credit meter. **NOTE:** This meter verifies the number of credits on the displayed credit meter.
(XXXXX)	(XXXXX) represents any bookkeeping meter. See Section 4, **Troubleshooting** under **Corrupted Bookkeeping Meter Data.**

BOOKKEEPING

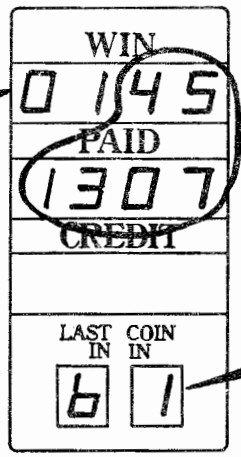
00 Coin In
01 Total In
02 Coin Out
03 Total Out
04 Total Games
05 Drop Meter
06 Credit Meter
07 Attendant Pays Meter
08 Hand Paid Meter
09 Super Jackpots
10 Door Opens
11 Games Since Door Open
12 Games Since Reset

GAMES

01 One Coin Games
02 Two Coin Games
03 Three Coin Games
04 Four Coin Games
05 Five or more Coin Games

BILL TRANSACTIONS

01 $1.00 Meter
02 $5.00 Meter
03 $10.00 Meter
04 $20.00 Meter
05 Change (total coins) Meter
06 Total Bills Meter

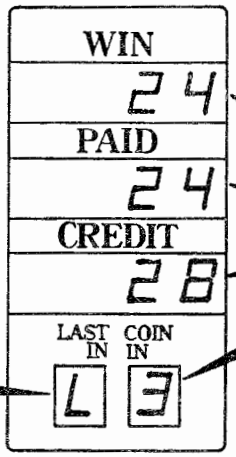


Displays the value of the particular meter being viewed. (In this sample, the total coins in would be 451,307.)

Meter Groups

1 Bookkeeping Meters
2 Win Record Meters
5 Games Meters
6 Bill Transaction Meters

LAST AND PREVIOUS GAME



Win amount.

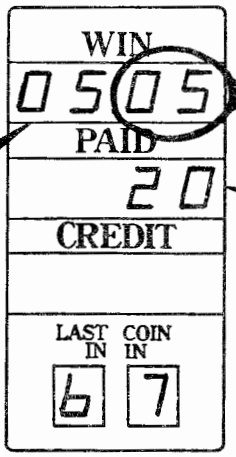
Amount paid from win.

Credits, if optioned.

Displays Coin-in amount.

L=Last Game
P=Previous Game

LAST FIVE BILLS TRANSACTIONS



Bill Denomination.

Number of coins the bill was changed for.

Displays which bill out of the last 5 bill transactions is viewed. Sequence is in reverse order.

In this example, the first bill accepted is displayed, it was a $5 bill, and it paid 20 coins.

Figure 3-6. LED Meter Display

Bookkeeping Meters (*continued*)

Accessing Other Meters

To access the Win Records, press the "PRESS FOR SERVICE" button during or immediately after viewing bookkeeping meters. While in bookeeping or any other meters, to stop or hold a meter for viewing, press the "SPIN" button or the pseudo coin button. When you release the button, the meter will continue.

To access the Last Game meters, press "PRESS FOR SERVICE" button 2 times, as above.

To access the Previous Game meters, press "PRESS FOR SERVICE" button 3 times, as above.

To access the Bill Transactions meter, press "PRESS FOR SERVICE" button 4 times, as above.

To access Last 5 Bill Transactions meter, press "PRESS FOR SERVICE" 5 times, as above.

Meters - LED Display Description

COIN IN and LAST IN Display

During meter viewing, the "COIN ACCEPTED" and "INSERT COIN" lamps are turned off. The **LAST IN** meter displays a "b" to indicate testing in all except the Last Game and Previous Game meters, which display "L" and "P", respectively. There are 7 meter groups:

1. Bookkeeping Meters
2. Win Record Meters
3. Last Game Meters
4. Previous Game Meters
5. Games Meters
6. Bill Transaction Meters
7. Last Five Bills Transactions

The **COIN IN** display shows the meter group being viewed (1-7 above), except for Last Game and Previous Game. For Last Game and Previous Game, the **LAST IN** display shows "L" or "P" to indicate which game, and **COIN IN** shows the actual coins played in that game. When viewing meters, carefully check both the **COIN IN** and the **LAST IN** displays.

WIN and PAID Display

For the Bookkeeping, Win Records, Games, and Bill Transactions meters, the **WIN** display will show, in the left two digits, which particular meter is being viewed. Shown in the **WIN** display's two right digits and continuing in the **PAID** display's 4 digits, will be the value of the meter.

For the Last and Previous Game meters, the **WIN** display shows the number of coins won. The **PAID** display shows the number of coins paid out when the player wins.

Meters - LED Display Description (*continued*)

For the Bills Transactions meter, the left two digits of the **WIN** display show the bill meter or total meter being viewed, as listed below. The right two **WIN** digits and the entire **PAID** display show the total transactions for the bill meter or total meter being viewed.

01 = $1.00	03 = $10.00	05 = Change (total coins)
02 = $5.00	04 = $20.00	06 = Total Number of Bills

For the Last Five Bills Transactions meter, the right two **WIN** digits show the denomination. The left two **WIN** digits show which bill, out of the last five inserted, is being viewed. It sequences as follows:

01 = 5th (last) bill inserted	04 = 2nd bill (out of last 5) inserted
02 = 4th (next to last) bill inserted	05 = 1st bill (out of last 5) inserted
03 = 3rd bill (out of last 5) inserted	

CREDITS Display

The **CREDITS** display is blank for all meters except the Last/Previous Game meters. This display shows the total number of credits accumulated, including the current win, if the game is optioned for credit play.

Corrupted Bookkeeping Meter Data

If any of the bookeeping meters become corrupted, "EE" is displayed in the two left digits of the **PAID** meter. To continue, turn the keyswitch.

Electro-Mechanical Meters

These meters duplicate the corresponding electronic meters. These meters are displayed at the top left edge of the display glass on the lower front door. In order to read the meters, position oneself to look up under the top left edge of the display glass bracket. Reading the meters from left to right with the door closed, they are as follows:

TOTAL IN	TOTAL OUT	CASHBOX (DROP METER)	ATTENDANT PAID (HAND PAID) (LOCK UP)

These meters are labeled on the meter assembly inside the lower door.

NOTE: A 5th meter, GAMES PLAYED, is an optional meter.

Troubleshooting

Power Up Malfunctions

(See Table 4-1 for descriptions of tilts.) A power-up malfunction may be any of the following:

1. If the 2 LEDs on the MPU board remain on, the game is in a reset. Call a senior service technician.
2. LED display center not functioning, and no lights. Check the power and fuses.
3. No display appears on the LED display center nad the payline lights flash. Open the door.

> — WARNING —
> Discharge body static to avoid any internal damage to the components.

   Check the connector to the LED display PCB. If the problem remains, call a senior service technician.

4. If either "83" or "84" appears on the LED display, check that SafeRAM (U31 and U100) and the RAM (U13/14 and U15/16) chips on the microprocessing unit board are seated properly. If the message remains, call the senior service technician.
5. If a coin-in jam occurs, "20" shows on the LED display. Place a sample coin or token in the comparator and adjust the electronic acceptor.
6. If the game is in a continuous reset mode, or if the program seems to "hang up" or "freeze," check that the piggyback board is properly seated on the MPU board.

Incompatible EPROMs

If the EPROMs are incompatible, the **WIN** meter displays the main program version number in the leftmost digit and the supplement program's main version number in the rightmost digit. The **PAID** meter displays the supplement program's personality version number in the leftmost digit and displays the personality program version number in the rightmost digit. If you have incompatible EPROMs, call a senior service technician.

Personality Strap

If the Personality program strap is changed, the WIN meter displays the previous strap selection. The leftmost digit displays the map table, the rightmost digit displays the win table. The PAID meter displays the new settings similarly.

If the selected Personality program strap is invalid, the WIN meter displays the invalid map number in the leftmost digit and the win table number in the rightmost digit. All other meters are blank.

TABLE 4-1. MALFUNCTION TILT CODES		
Code	**Description**	**Malfunction Condition**
20	Coin-in Jam	No sample coin in comparator on power-up. Coin stuck in comparator or took too long to pass through—loosen the rail adjustment
21	Inappropriate Coin In	Coins detected as accepted during a game state in which coins should be locked out.
24	Coin Reverse	Stringing of a coin. Coin bounced up—tighten the rail adjustment
31	Hopper Jam	Coin(s) jammed under hopper rocker and roller assembly.
32	Hopper Empty	No coins sensed by coin out switch for 12 seconds.
33	Over Pay	Hopper paid out 1 or more coins than winning amount.
34	Reset During Payout	Unintentional reset (static) or blackout occured during reset.
40	Reel 1 Malfunction	Reel disturbance or improper spin detected by sensors. Reels go into a slow spin state.
41	Reel 2 Malfunction	
42	Reel 3 Malfunction	
43	Reel 4 Malfunction	
44	Reel 5 Malfunction	
45	Bad Reel 1 Movement	Designated reel moved after indexing.
46	Bad Reel 2 Movement	
47	Bad Reel 3 Movement	
48	Bad Reel 4 Movement	
49	Bad Reel 5 Movement	
53	Door Open Spin	Door open during reel spin.
80	Memory Error	
81	Check/Bad Battery	Battery voltage below acceptable level.
83	SafeRAM Error	
84	RAM Error	
90	Display Center Failure	LED display malfunction.
99	Lockup for Attend. Pay	Game locks up and waits for attendant hand-pay.

Maintenance and Repair

The most important part of a regular maintenance program is the machine's diagnostic test functions. Run all diagnostic tests after maintenance and/or replacement of parts or assemblies. See Section 2, **Location and Setup,** under **Diagnostic Tests** for detailed instructions.

General Cleaning

The outside of the machine cabinet and exterior metal trim can be cleaned with any *non-abrasive* household cleaner. Both sides of all other glass or plastic on or in the machine **must** be cleaned with an **anti-static type cleaner ONLY!**

Replace Fuses

The machine contains a total of 3 fuses. To replace a fuse, see *figure 5-1* and follow these steps:

- WARNING -
NEVER USE FUSES WITH AN AMPERAGE RATING HIGHER THAN STATED IN THE ASSEMBLY DRAWINGS.

1. Unlock and open the lower machine door.
2. Flip the power switch off.
3. The fuses are located on the bracket assembly below the card cage. The two fuses on the left are for the 110 V line voltage and are rated 3 AMPs. The fuse located third from the left is +24v DC and is rated 8 AMPs.
4. Replace the blown fuse(s) using a fuse puller tool.
5. Apply power.
6. Test operate the machine. If the fuse blows again, call a senior service technician.

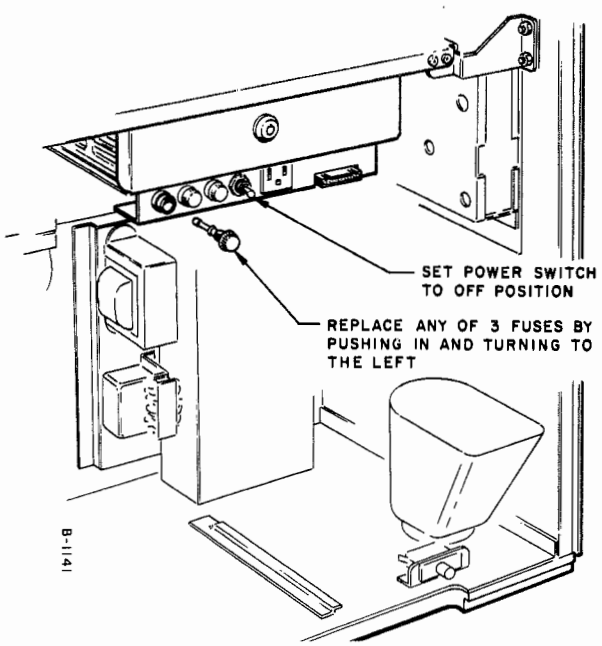


Figure 5-1. Replace Fuses

Replace Reel Mechanism Assembly

To remove the reel mechanism assembly, see *figure 5-2* on the next page, and follow these steps:

1. Open the lower and upper machine doors.
2. Flip the power switch off.
3. Loosen the 2 screws on the tie channel.
4. Lift and remove the tie channel.
5. Disconnect the reel motor and the reel optic board connectors from the reel control board.
6. Remove the 2 screws that are located to the far right front and far left front of the reel mechanism mounting base.
7. Grasp the reel mechanism with the reel hub and the reel and motor bracket. Tilt the front of the reel mechanism assembly up and slide forward from the side screws. Lift reel mechanism assembly out.

NOTE: Carry the reel mechanism by the bracket and the mounting base to prevent damage to the reels.

NOTES

Replace a Reel and Motor Assembly

To remove a reel and motor assembly, see *figure 5-2* below, and follow these steps:

1. Follow steps 1 through 6 of **Replace Reel Mechanism Assembly** on page 5-2.
2. Disconnect the reel motor and the reel optic board from the reel control board.
3. Remove the 2 screws from the front of the specific reel and motor bracket.
4. Grasp the reel and motor bracket and slide the assembly forward form the mounting flange and lift out.

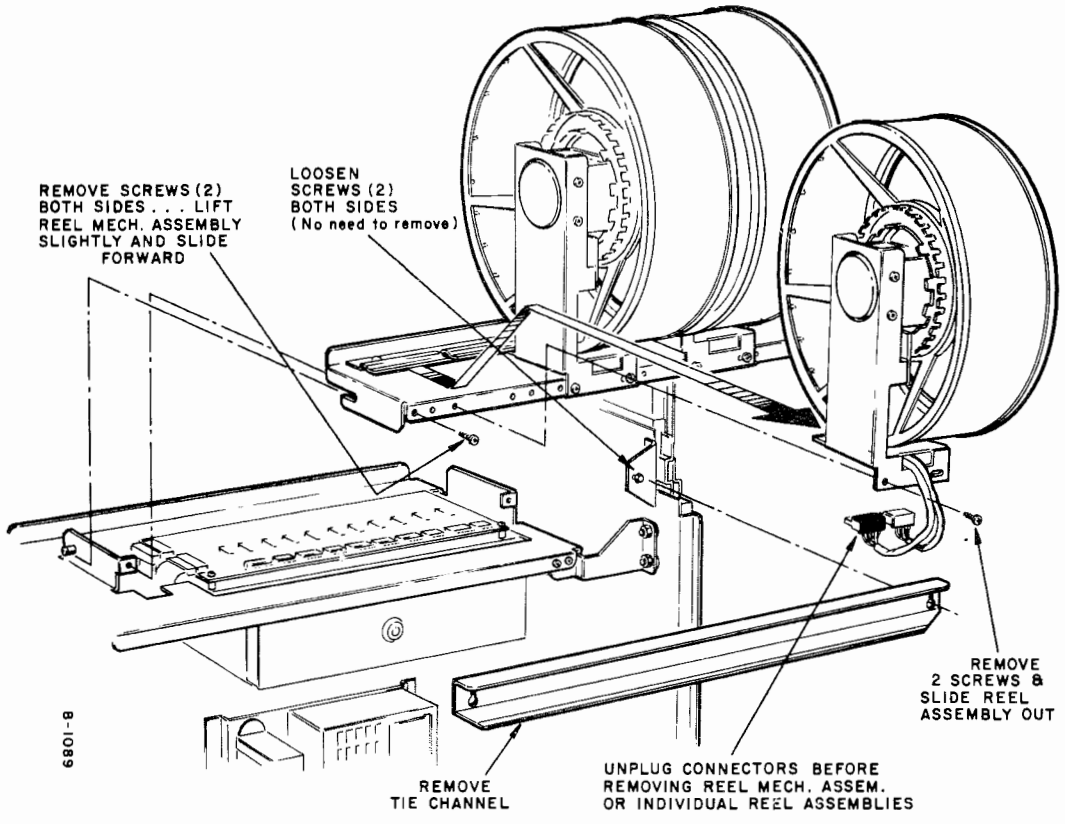


Fig. 5-2. Replace Reel Mechanism and Motor Assemblies

Replace Printed Circuit Boards

When replacing any printed circuit board (PCB):

1. Open the machine doors.

2. Flip the power switch off.

3. Remove the PCB and place it in a holder (static-safe) for safe transportation to the lab.

- WARNING -
DISCHARGE BODY STATIC BEFORE HANDLING THE PRINTED CIRCUIT BOARD OR IC CHIPS TO AVOID DAMAGE TO ELECTRONIC COMPONENTS.

NOTES

Replace Printed Circuit Boards *(continued)*

Remove I/O Board, MPU Board

1. Unlock the card rack door and remove it. (*Figure 5-3*)
2. Flip out the card ejectors found on the sides of the PCB.
3. Slide the board forward.
   Top - I/O Board
   Lower - MPU Board

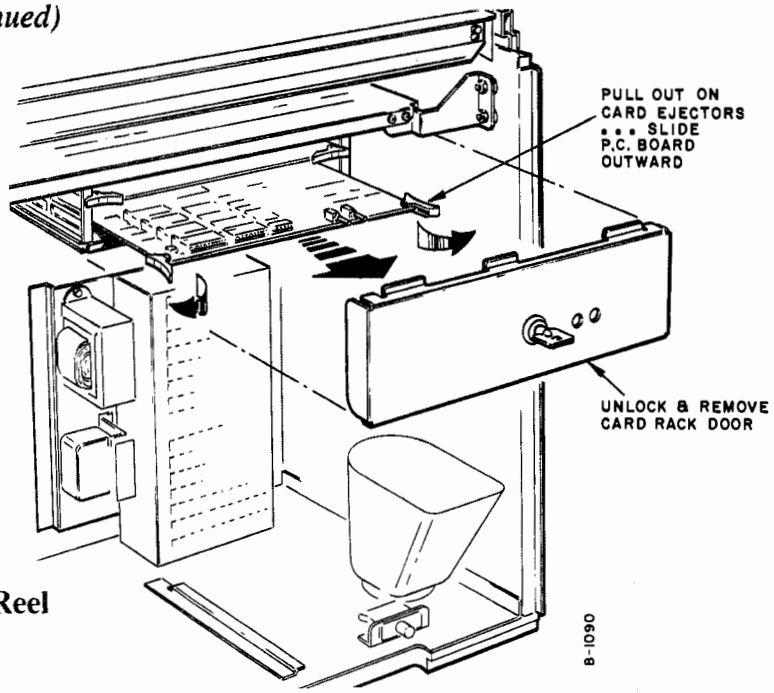


Figure 5-3. Remove I/O and MPU Boards

Remove Reel Control Board

1. Remove the reel mechanism. See **Replace Reel Mechanism Assembly** on page 5-3.
2. Disconnect the 8-pin power connector and the 34-pin data connector from the left side of the reel control PCB.
3. Take out the 5 screws and lift out the reel control board.

Remove the Handle Sensor PCB

1. With an open end wrench, remove the 2 screws on the handle sensor board.
2. Carefully remove and unplug the PCB from between the handle mechanism cover and the shelf.

Remove Hopper Control Board

1. Remove the hopper. See **Replace Hopper Mechanism** on the following page.
2. Remove the 2 screws from the hopper control board. *(Figure 5-4)*
3. Firmly grasp the hopper control PCB and pull forward. This disconnects it from the backplae at J26 and J27.

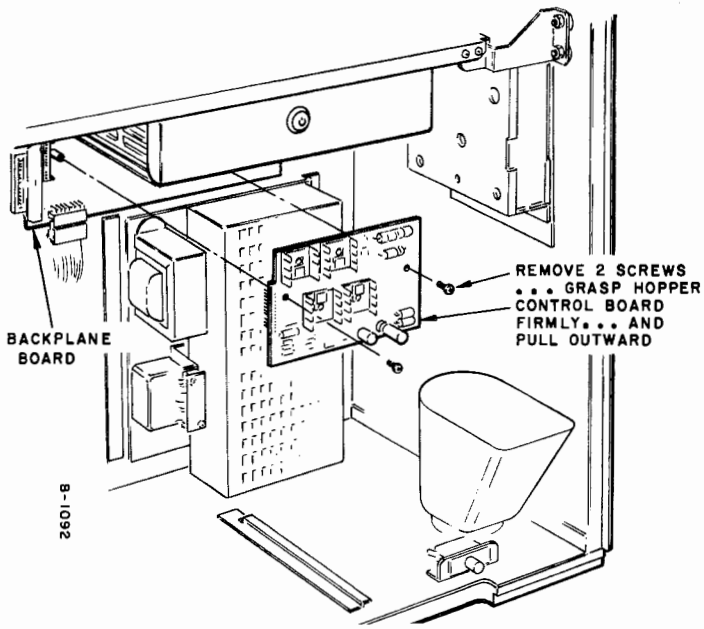


Figure 5-4. Remove Hopper Control Board

Replace Power Supply

To remove the entire power supply assembly, including the line filter and transformer, follow these steps:

1. Open the lower machine door.
2. Flip the power switch off.
3. Remove the hopper. See **Replace Hopper**, below
4. Disconnect the cabling, noting how the connectors attach.
5. Loosen and remove the cable clamp holding the line cord to the power supply mounting plate.
6. Loosen the 4 screws on the power supply assembly mounting plate.
7. Slide the assembly to the left, and pull out.

Replace Hopper Mechanism

1. Open the front door.
2. Disconnect the hopper cable from the backplane at J10.
3. Grasp the handle on the hopper unit and pull forward.

NOTES

Hopper Adjustments

Adjust Hopper Wiper

The wiper knocks off coins stuck together, which allows only 1 coin to pass. To adjust the wiper, see *figure 5-5* and follow these steps:

1. Turn the pin wheel to position a coin under the wiper.

2. Loosen both mounting screws and move the wiper edge up to the coin.

3. Tighten both screws just enough to allow the wiper to be moved in and out.

4. Slide a coin under the wiper edge and release it. The coin should fall down onto the shelf wheel. The wiper edge should be close to the coin, but not holding it.

5. Tighten the back screw, then the front screw, constantly checking the wiper position to the coin. Continue to tighten the back screw then the front until the wiper cannot be moved in or out. DO NOT over-tighten the screws as the head of the screw will break off.

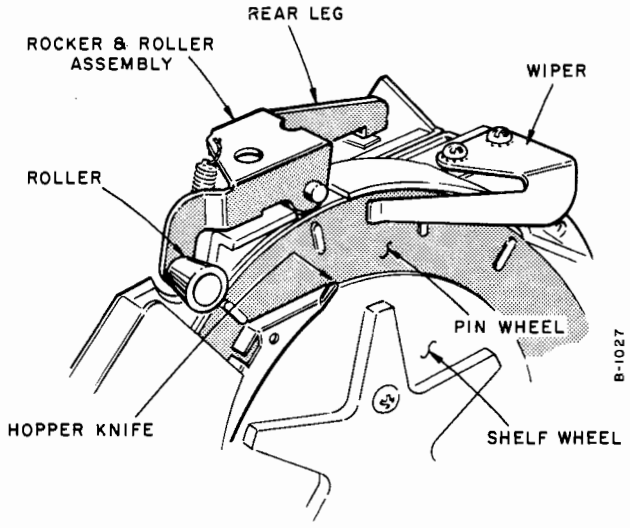


Figure 5-5. Adjust Hopper Wiper and Knife Position

Adjust Hopper Knife Position

The forward edge of the hopper knife presses against the pin wheel and touches the edge of the shelf wheel (*Figure 5-5*). This allows no coin to wedge itself between the blade and the pin wheel when coins are being dispensed.

NOTE: Do not apply any grease or oil to any area that comes in contact with the coins.

Hopper Adjustments (*continued*)

Adjust Hopper Microswitch

This switch is used to detect each coin as it is paid out of the hopper. The switch is of the low current capability, gold-crosspoint type. The mechanism that trips the microswitch is designed to provide a variable time-delay between coin detection and actuation of the microswitch.

Check for positive microswitch actuation with a coin directly beneath the roller. Verify that the microswitch is open with no coin beneath the roller. To adjust this mechanism, see *figure 5-6* and follow these steps:

1. Loosen the nut on the rocker and roller assembly.

2. Screw the adjustment screw down to within 1/32" of the switch actuator blade.

3. Tighten the nut.

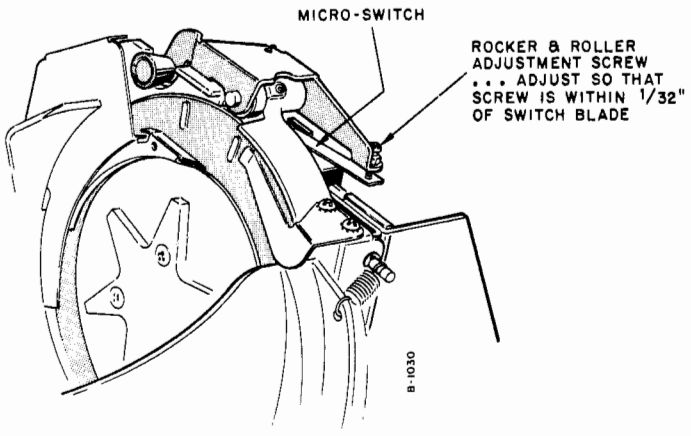


Figure 5-6. Adjust Hopper Microswitch

NOTES

Hopper Adjustments (*continued*)

Adjust Hopper Counterbalance

To set the hopper at a given desired capacity, adjust the hopper counterbalance as follows:

1. Fill the hopper with the desired level of coins.
2. Turn the set screw clockwise until the actuator of the microswitch is in the "up" position. (*Figure 5-7*)
3. Turn the set screw counter-clockwise very gradually until the microswitch clicks down. The hopper is set at the given desired capacity.

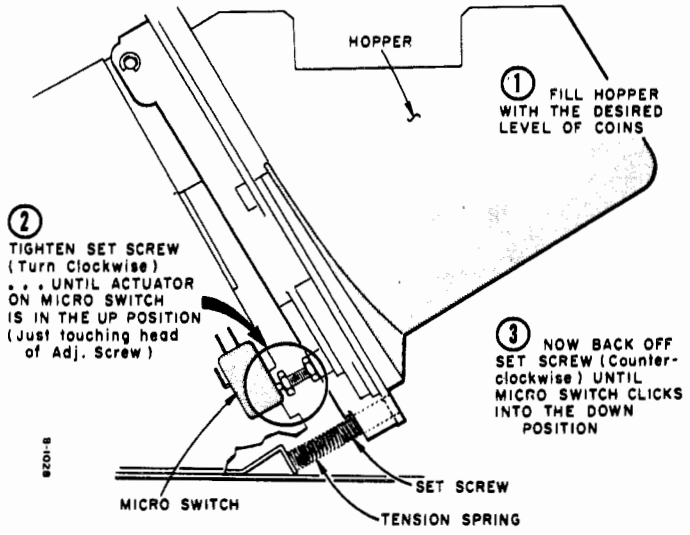


Figure 5-7. Adjust Hopper Counterbalance

Replace Light Bulbs

Reel Glass Fluorescent Bulb

1. Open the lower and upper doors.
2. Flip the power switch off.
3. Remove and replace bulbs.

Replace Display Glass Fluorescent Bulb

1. Open the lower door.
2. Flip the power switch off.
3. Lift up on the side latches of the coin comparator and pivot the top out and down.
4. Loosen 2 screws. One is found through the right while in the coin comparator housing and one is found above the electro- mechanical meters. Both are securing the display glass bracket. (See *Figure 5-8* on the following page.)
5. Push up on the bottom of the display glass and pull out the glass.
6. Replace the fluorescent bulb.
7. When reinstalling the display glass, see the call out in *figure 5-8* on the following page.

Replace Light Bulbs *(continued)*

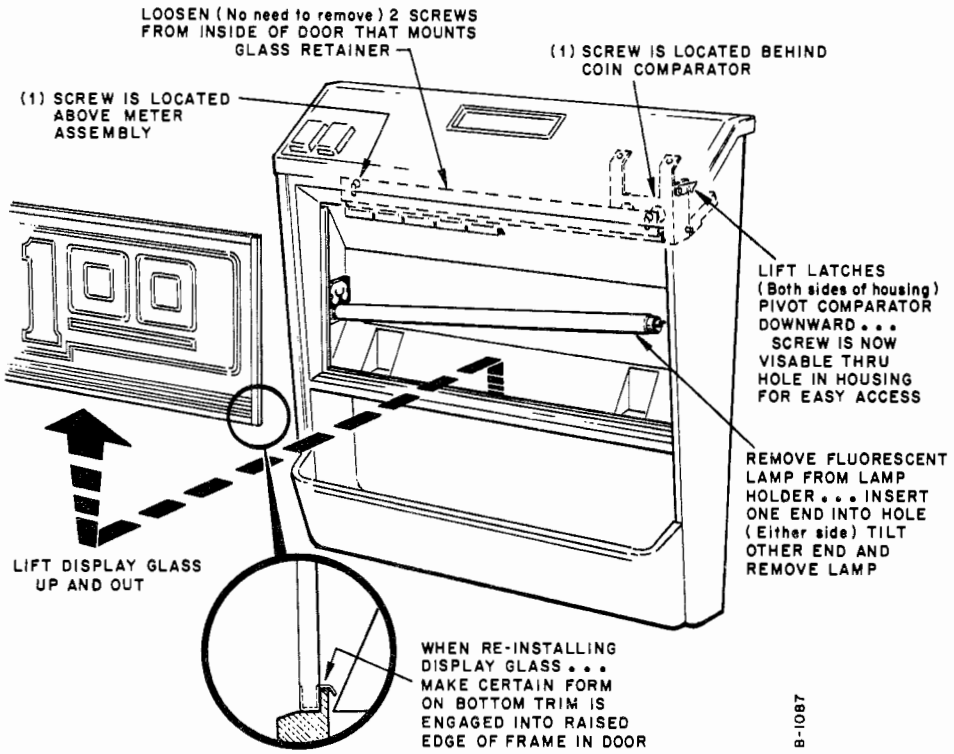


Figure 5-8. Replace Light Bulbs

Replace Deck Button Switch

1. Open the lower door.
2. Flip the power switch off.
3. Pull the switch from the pushbutton assembly.
4. Pull the switch from the wire connectors and replace the switch.

Replace Ballast and Starter

1. Open the lower and upper machine doors.
2. Flip the power switch off.
3. Remove top feature light glass by lifting the frame up and pulling it forward.
4. Disconnect the two 6-point ballast and starter connectors and the 4-point flurorescent light cabling. (See also the cabinet cabling detail diagram in Manual FO-5013 - parts catalog.)
5. Loosen (do not remove) the 2 screws above the fluorescent bulb in the light reflector assembly.
6. Lift the assembly up and over screws to remove.

Handle Mechanism Operation

Software signals the solenoid to activate. This causes the release pawl to drop down and hold the lock pawl away from the rack lock lever. Pulling the handle causes the rack lock lever to pivot, contacting the full stroke pawl. The optical reflective switches on the handle sensor PCB relay the handle position to the game program. The ratchet effect, caused by the full stroke pawl falling aginst the rack lock lever, requires a completed handle pull to release.

When completing the handle pull, the rack lock lever stops at the rear bumpers. The extension spring pulls the full stroke pawl, reversing its direction. The compression spring causes the rack lock lever and handle to return to the starting position. The lock pawl falls into the rear notch of the rack lock lever, preventing a handle pull until the solenoid is activated again. The full stroke pawl springs back to its starting postions.

— WARNING —
DO NOT ALLOW THIS MACHINE TO BE OPERATED BY PLAYERS IF THE HANDLE IS LOOSE, BENT, CRACKED, OR OTHERWISE DAMAGED OR WEAKENED. INJURY TO PLAYERS MAY OCCUR IF USER(S) ALLOW A MACHINE WEAKENED HANDLE TO REMAIN IN SERVICE WITH A DAMAGED OR WEAKENED HANDLE TO REMAIN IN SERVICE.

Replace Handle

— WARNING —
DO NOT USE REPAIRED OR REWORKED HANDLES TO REPLACE DAMAGED OR WEAKENED HANDLES. SUCH HANDLES MAY NOT BE ADEQUATE TO PREVENT PLAYER INJURY. ONLY HANDLES MANUFACTURED BY BALLY MANUFACTURING CORPORATION ARE APPROVED FOR USE ON BALLY EQUIPMENT.

1. Pop out the plug button in the center of the hub to expose the set screw. (*Figure 5-9*)
2. Using an Allen wrench, remove the set screw.
3. Unscrew and remove the handle. The hub falls free.
4. Apply thread sealer (Bally No. M-1711-1) to the handle and screw threads.
5. Screw in the new handle holding the hub in place. Tighten handle in shaft with an open end wrench.
6. Using the Allen wrench, tighten the set screw against the handle.
7. Replace the plug button.
8. Let the sealer cure 1 hour.

*See the **lubrication guide** on the following page.*

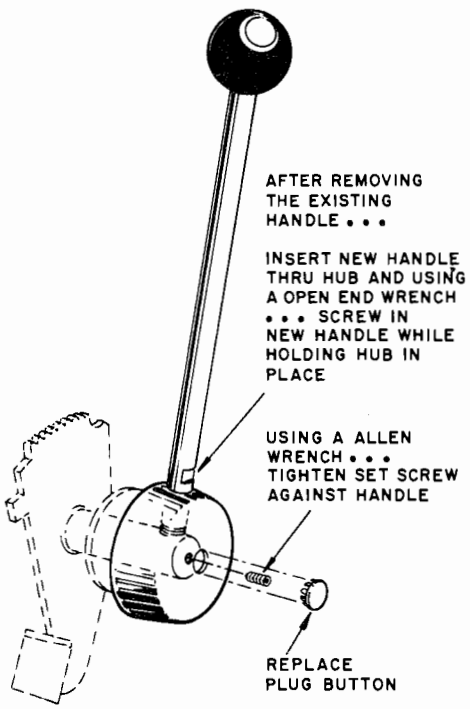
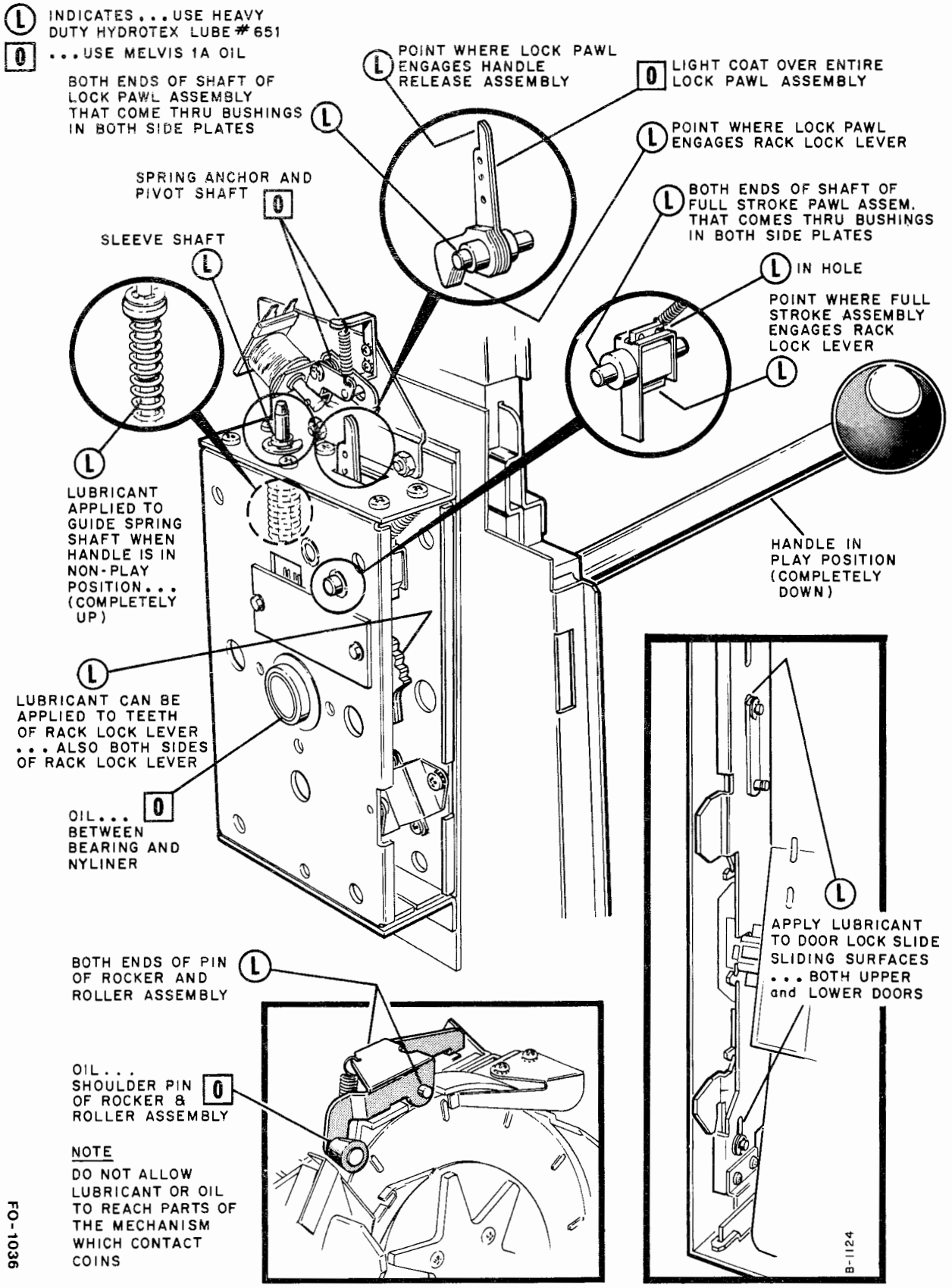


Figure 5-9. Replace Handle

NOTES

Lubrication Guide



Clear Bill Acceptor and Transport

The machine must be in a game over state with the door closed before you can clear a jammed bill.

1. Open the lower front door.
2. Turn the power switch off.
3. If the bill is jammed in the MARS unit see the MARS manual. Otherwise, the bill is is jammed in the transport.
4. Unlock the transport door (*figure 5-10*). Remove jammed bill. If bill is jammed further in the transport:
   (1) Remove hopper (see page 5-6).
   (2) Pivot the transport door open.
   (3) Pull door out.
   (4) Remove jammed bill.
5. Replace and lock the transport door. Remove the key.
6. Turn power switch on and press "RESET" button on the MPU board to clear the jam fault. The transport motor will begin running.
7. Manually insert the jammed bill that you just removed from the transport throat. Wait for the bill to be deposited into the cash box. (Once a bill has passed through the MARS unit, the bill is a *valid* bill in and must be inserted into the cash box.)
8. Close and lock the machine door.

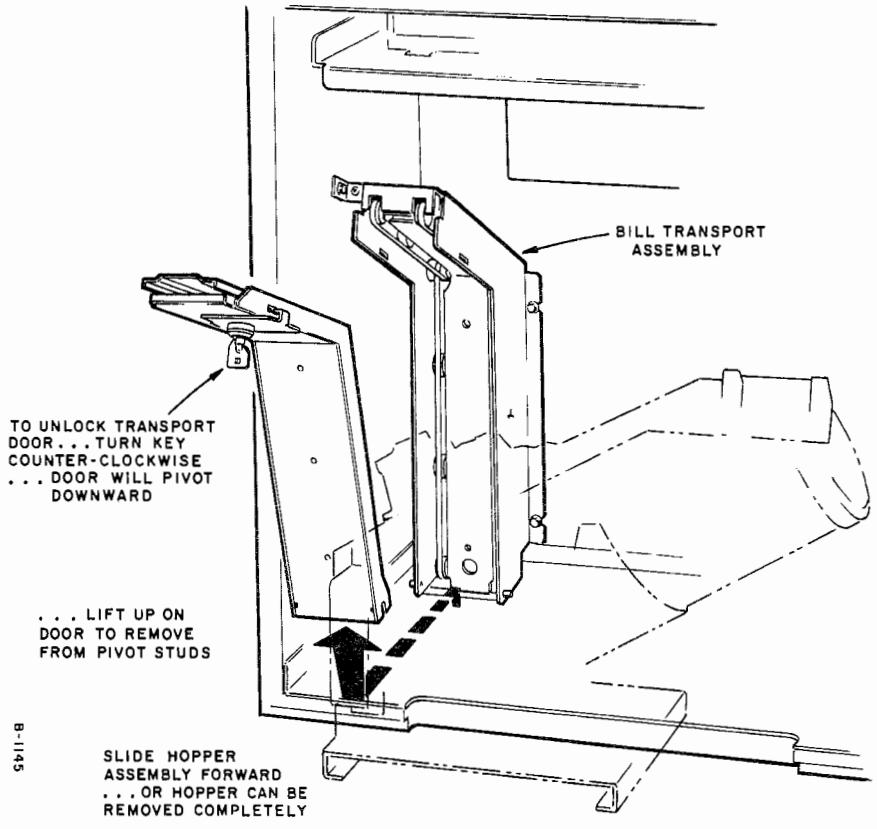


Figure 5-10. Clear Bill Transport

Replace Coin Comparator

To remove the coin comparator, see *figure 5-11* and follow these steps:

1. Disconnect the 7-pin connector from the electronics package.
2. Remove the 2 screws from the bracket which is attached to the comparator electronics package.
3. While pulling both leaf springs outward simultaneously, tilt the comparator forward and lift it up and out.

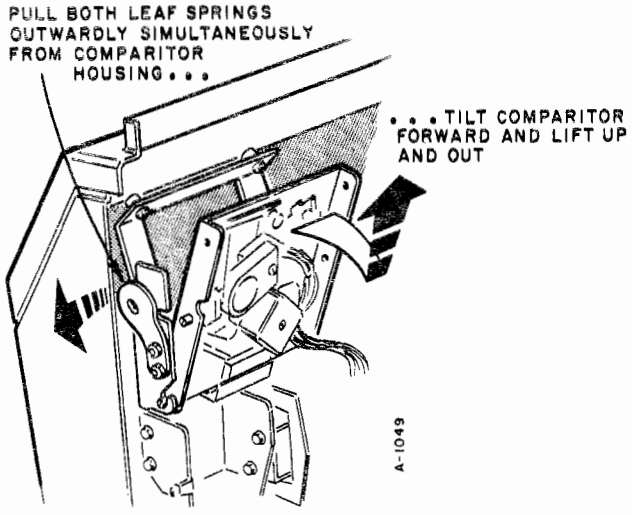


Figure 5-11. Replace Coin Comparator

Replace Coin Comparator Housing

To remove the coin comparator housing, see *figure 5-12* and follow these steps:

1. Remove the coin comparator. See **Replace Coin Comparator**, above.
2. Remove the 2 screws fastening the comparator housing to the door.
3. Lift up and out.
4. When replacing, insert the tab at the bottom of the housing into the slot of the light display assembly.

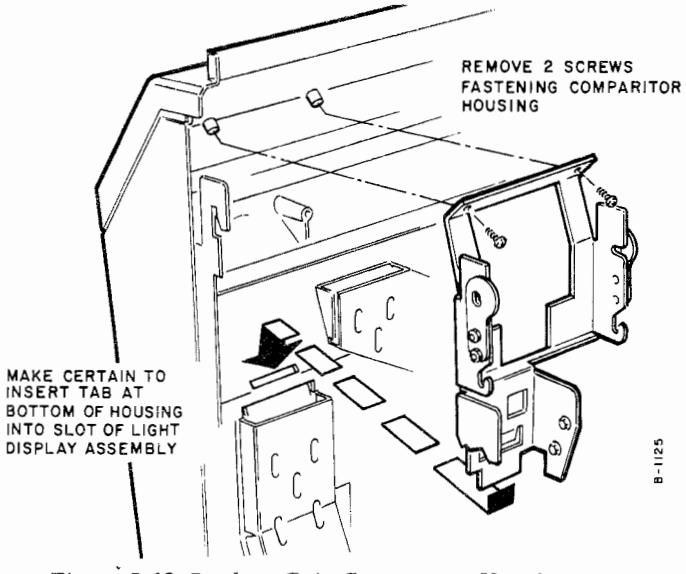
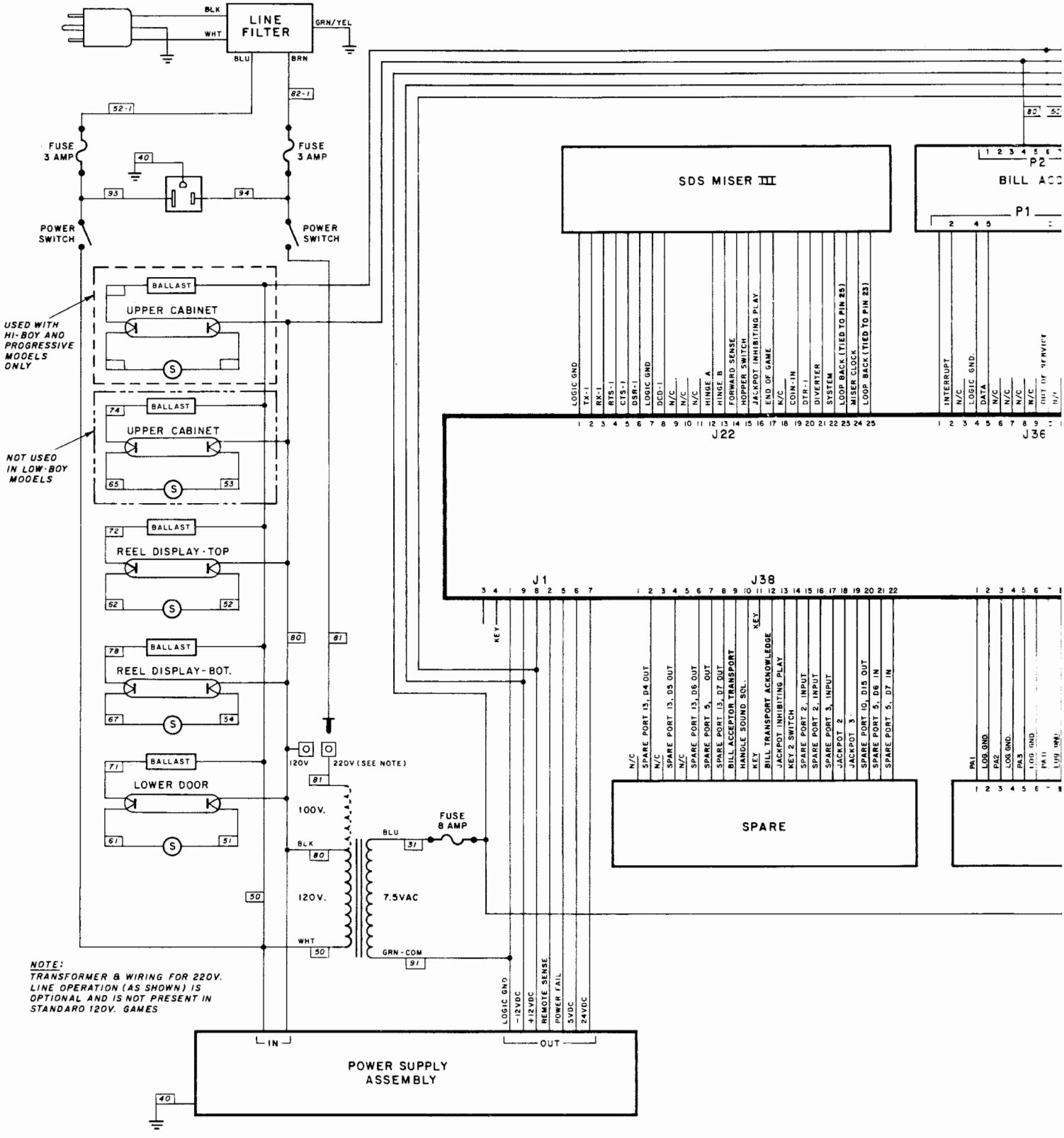


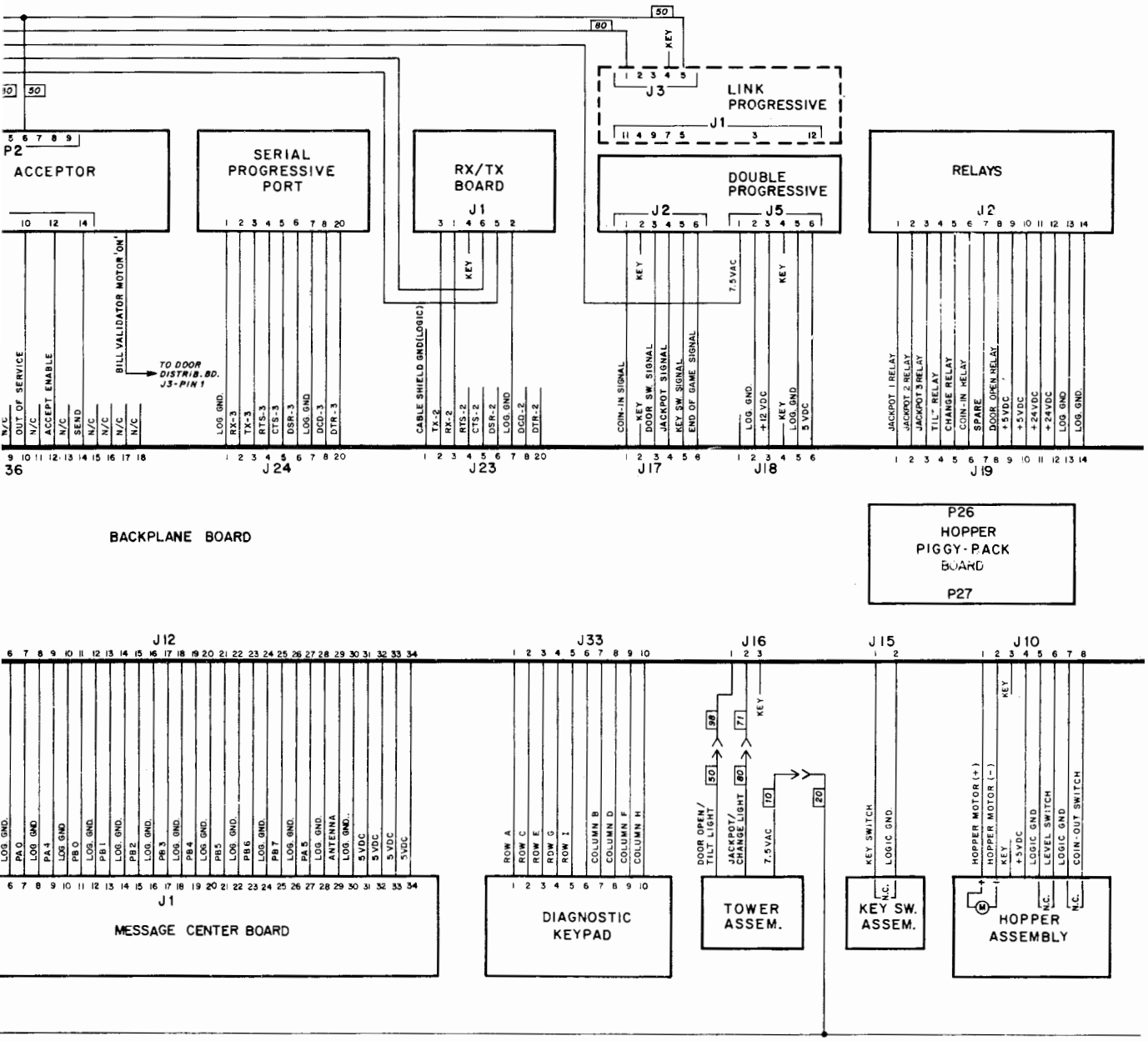
Figure 5-12. Replace Coin Comparator Housing

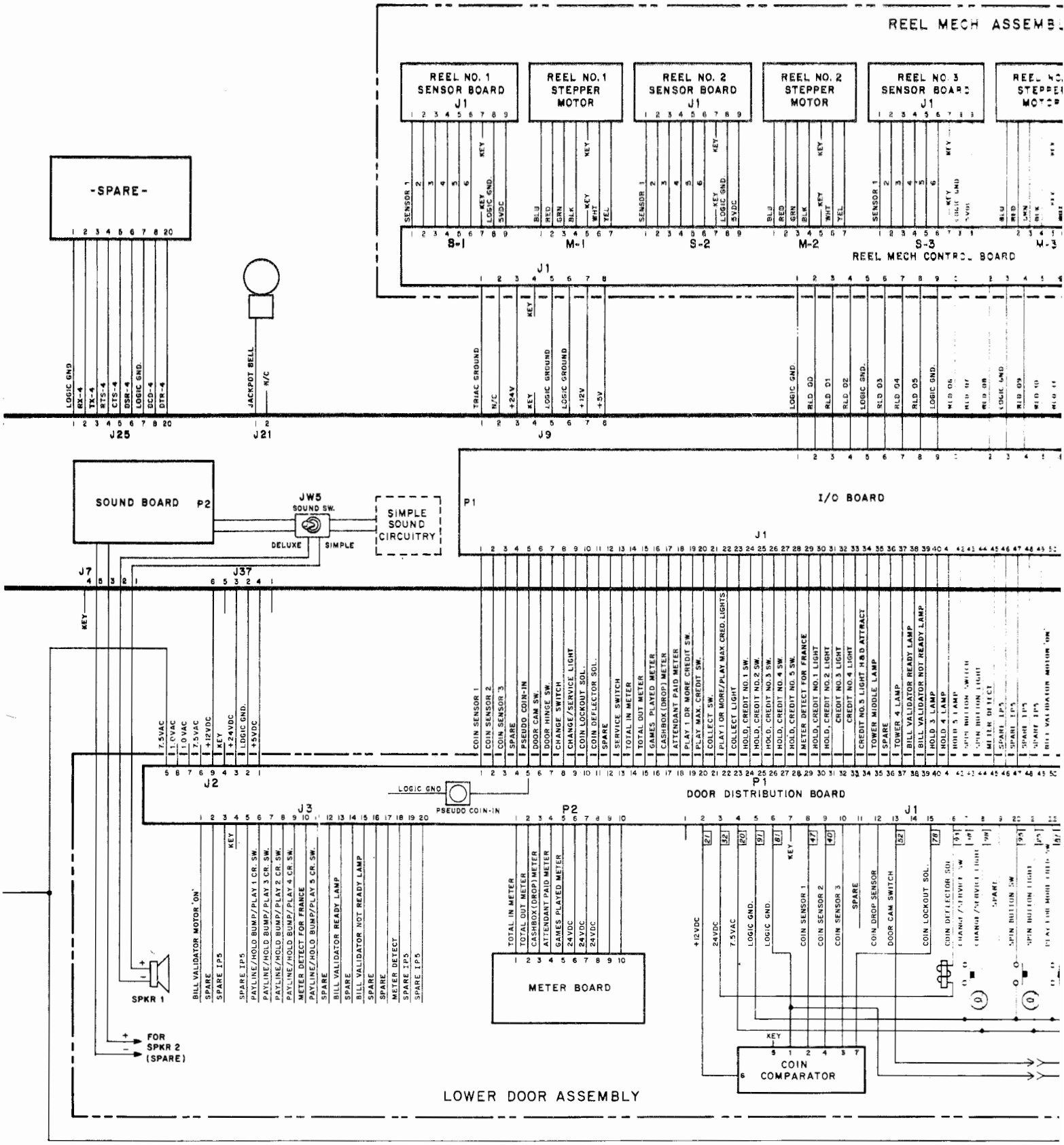
NOTE: The coin comparator enable/disable switch on AS-3356-74 door distribution board will allow the inoperable game to remain lit and "on" while locking out coins.

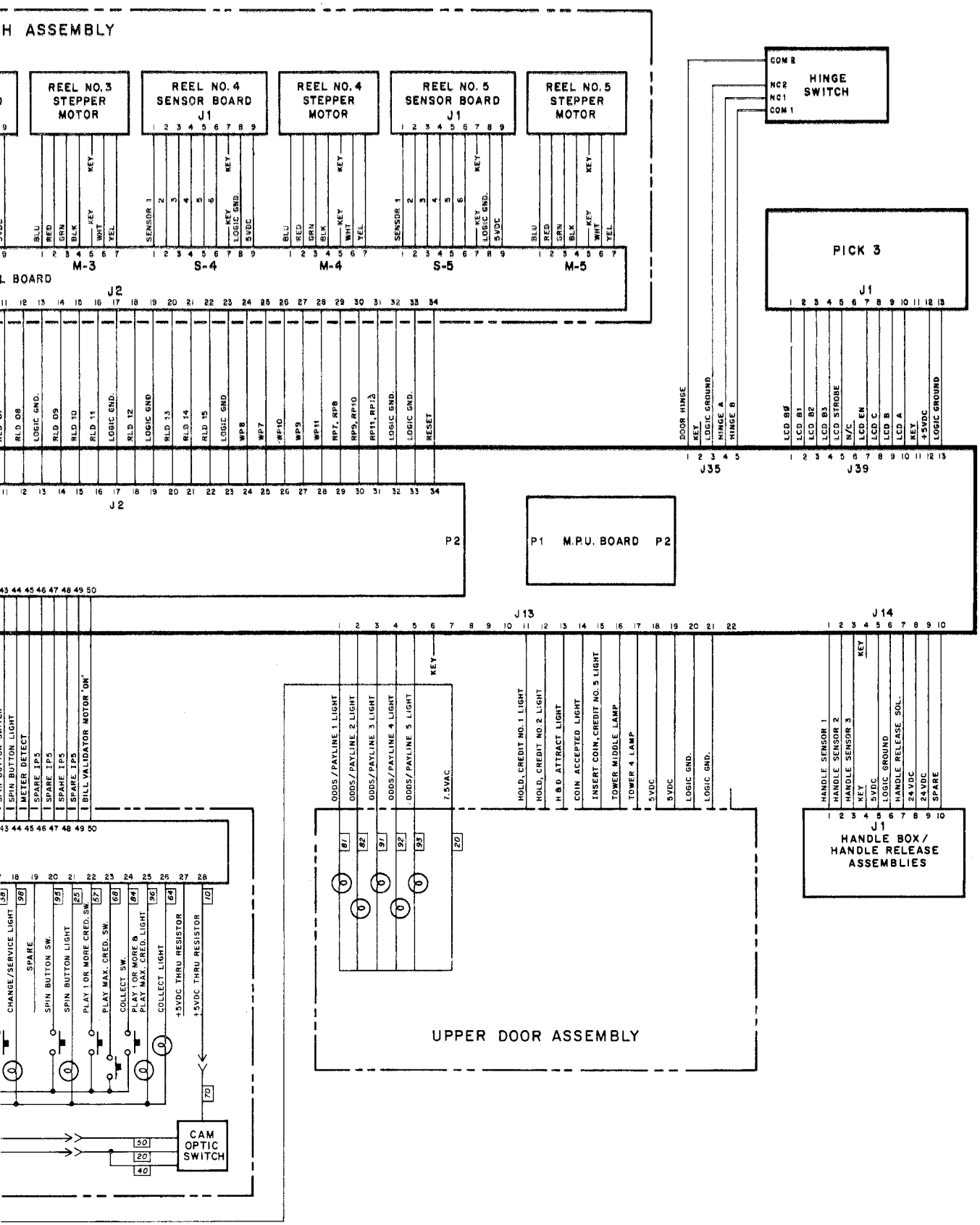
Appendix 1.

W-1046-3066
Overall Wiring Diagram


LINE FILTER
BLK
WHT
GRN/YEL
BLU
BRN
FUSE 3 AMP
FUSE 3 AMP
POWER SWITCH
POWER SWITCH
BALLAST
UPPER CABINET
USED WITH HI-BOY AND PROGRESSIVE MODELS ONLY
BALLAST
UPPER CABINET
NOT USED IN LOW-BOY MODELS
BALLAST
REEL DISPLAY-TOP
BALLAST
REEL DISPLAY-BOT.
BALLAST
LOWER DOOR
120V
220V (SEE NOTE)
100V.
120V.
7.5VAC
FUSE 8 AMP
BLU
BLK
WHT
GRN-COM
NOTE:
TRANSFORMER & WIRING FOR 220V. LINE OPERATION (AS SHOWN) IS OPTIONAL AND IS NOT PRESENT IN STANDARD 120V. GAMES
SDS MISER III
J22
J36
J1
J38
SPARE
LOGIC GND
-12VDC
+12VDC
REMOTE SENSE
POWER FAIL
5VDC
24VDC
IN
OUT
POWER SUPPLY ASSEMBLY


P2
ACCEPTOR
SERIAL PROGRESSIVE PORT
RX/TX BOARD
J1
J3
LINK PROGRESSIVE
J1
DOUBLE PROGRESSIVE
J2
J5
RELAYS
J2
BILL VALIDATOR MOTOR 'ON'
TO DOOR DISTRIB. BD. J3-PIN 1
OUT OF SERVICE
ACCEPT ENABLE
SEND
LOG GND
RX-3
TX-3
RTS-3
CTS-3
DSR-3
DCD-3
DTR-3
CABLE SHIELD GND(LOGIC)
TX-2
RX-2
RTS-2
CTS-2
DSR-2
DCD-2
DTR-2
COIN-IN SIGNAL
DOOR SW. SIGNAL
JACKPOT SIGNAL
KEY SW. SIGNAL
END OF GAME SIGNAL
+12 VDC
5 VDC
JACKPOT 1 RELAY
JACKPOT 2 RELAY
JACKPOT 3 RELAY
TILT RELAY
CHANGE RELAY
COIN-IN RELAY
SPARE
DOOR OPEN RELAY
+5 VDC
+24 VDC
J24
J23
J17
J18
J19
BACKPLANE BOARD
P26
HOPPER PIGGY-PACK BOARD
P27
J12
J33
J16
J15
J10
J1
MESSAGE CENTER BOARD
DIAGNOSTIC KEYPAD
TOWER ASSEM.
KEY SW. ASSEM.
HOPPER ASSEMBLY
DOOR OPEN / TILT LIGHT
JACKPOT / CHANGE LIGHT
7.5 VAC
KEY SWITCH
LOGIC GND
HOPPER MOTOR (+)
HOPPER MOTOR (-)
LEVEL SWITCH
COIN-OUT SWITCH
N.C.


REEL MECH ASSEMBL
REEL NO. 1 SENSOR BOARD
J1
REEL NO. 1 STEPPER MOTOR
REEL NO. 2 SENSOR BOARD
J1
REEL NO. 2 STEPPER MOTOR
REEL NO. 3 SENSOR BOARD
J1
S-1
M-1
S-2
M-2
S-3
REEL MECH CONTROL BOARD
-SPARE-
LOGIC GND
RX-4
TX-4
RTS-4
CTS-4
DSR-4
LOGIC GND.
DCD-4
DTR-4
J25
JACKPOT BELL
N/C
J21
TRIAC GROUND
+24V
+12V
+5V
LOGIC GROUND
J9
RLD 00
RLD 01
RLD 02
RLD 03
RLD 04
RLD 05
RLD 09
SOUND BOARD P2
JW5
SOUND SW.
DELUXE
SIMPLE
SIMPLE SOUND CIRCUITRY
P1
I/O BOARD
J7
J37
COIN SENSOR 1
COIN SENSOR 2
COIN SENSOR 3
PSEUDO COIN-IN
DOOR CAM SW.
DOOR HINGE SW.
CHANGE SWITCH
CHANGE/SERVICE LIGHT
COIN LOCKOUT SOL.
COIN DEFLECTOR SOL.
SERVICE SWITCH
TOTAL IN METER
TOTAL OUT METER
GAMES PLAYED METER
CASHBOX (DROP) METER
ATTENDANT PAID METER
PLAY 1 OR MORE CREDIT SW.
PLAY MAX. CREDIT SW.
COLLECT SW.
COLLECT LIGHT
HOLD, CREDIT NO. 1 SW.
HOLD, CREDIT NO. 2 SW.
HOLD, CREDIT NO. 3 SW.
HOLD, CREDIT NO. 4 SW.
HOLD, CREDIT NO. 5 SW.
METER DETECT FOR FRANCE
HOLD, CREDIT NO. 1 LIGHT
HOLD, CREDIT NO. 2 LIGHT
CREDIT NO. 3 LIGHT
CREDIT NO. 4 LIGHT
CREDIT NO. 5 LIGHT H&D ATTRACT
TOWER MIDDLE LAMP
SPARE
TOWER 4 LAMP
BILL VALIDATOR READY LAMP
BILL VALIDATOR NOT READY LAMP
HOLD 3 LAMP
HOLD 4 LAMP
7.5VAC
10VAC
10VAC
7.5VAC
+12VDC
+24VDC
LOGIC GND.
+5VDC
KEY
J2
P1
DOOR DISTRIBUTION BOARD
LOGIC GND
PSEUDO COIN-IN
J3
P2
J1
BILL VALIDATOR MOTOR 'ON'
SPARE
SPARE IP5
PAYLINE/HOLD BUMP/PLAY 1 CR. SW.
PAYLINE/HOLD BUMP/PLAY 3 CR. SW.
PAYLINE/HOLD BUMP/PLAY 2 CR. SW.
PAYLINE/HOLD BUMP/PLAY 4 CR. SW.
METER DETECT FOR FRANCE
PAYLINE/HOLD BUMP/PLAY 5 CR. SW.
BILL VALIDATOR READY LAMP
BILL VALIDATOR NOT READY LAMP
METER DETECT
SPKR 1
FOR SPKR 2 (SPARE)
TOTAL IN METER
TOTAL OUT METER
CASHBOX (DROP) METER
ATTENDANT PAID METER
GAMES PLAYED METER
24VDC
METER BOARD
+12VDC
24VDC
7.5VAC
LOGIC GND.
COIN SENSOR 1
COIN SENSOR 2
COIN SENSOR 3
SPARE
COIN DROP SENSOR
DOOR CAM SWITCH
COIN LOCKOUT SOL.
COIN DEFLECTOR SOL.
SPIN BUTTON SW.
SPIN BUTTON LIGHT
COIN COMPARATOR
LOWER DOOR ASSEMBLY


H ASSEMBLY
REEL NO. 3 STEPPER MOTOR
REEL NO. 4 SENSOR BOARD J1
REEL NO. 4 STEPPER MOTOR
REEL NO. 5 SENSOR BOARD J1
REEL NO. 5 STEPPER MOTOR
M-3
S-4
M-4
S-5
M-5
L BOARD
J2
COM 2
NC2
NC1
COM 1
HINGE SWITCH
PICK 3
J1
DOOR HINGE
KEY
LOGIC GROUND
HINGE A
HINGE B
J35
J39
P2
P1 M.P.U. BOARD P2
J13
J14
ODDS/PAYLINE 1 LIGHT
ODDS/PAYLINE 2 LIGHT
ODDS/PAYLINE 3 LIGHT
ODDS/PAYLINE 4 LIGHT
ODDS/PAYLINE 5 LIGHT
7.5VAC
HOLD, CREDIT NO. 1 LIGHT
HOLD, CREDIT NO. 2 LIGHT
H.B.D. ATTRACT LIGHT
COIN ACCEPTED LIGHT
INSERT COIN, CREDIT NO. 5 LIGHT
TOWER MIDDLE LAMP
TOWER 4 LAMP
5VDC
LOGIC GND.
HANDLE SENSOR 1
HANDLE SENSOR 2
HANDLE SENSOR 3
HANDLE BOX/ HANDLE RELEASE ASSEMBLIES
UPPER DOOR ASSEMBLY
CHANGE/SERVICE LIGHT
SPARE
SPIN BUTTON SW.
SPIN BUTTON LIGHT
PLAY 1 OR MORE CRED. SW.
PLAY MAX. CRED. SW.
COLLECT SW.
PLAY 1 OR MORE & PLAY MAX. CRED. LIGHT
COLLECT LIGHT
+5VDC THRU RESISTOR
CAM OPTIC SWITCH

Appendix 2.

Glossary

A

ASCII — American Standard Code for Information Interchange.

asynchronous — Operations that start a new operation immediately upon completion of a current one. These operations are not timed by a system clock.

attendant (hand) paid jackpot — All or any portion of the coins won that require an attendant to pay the player.

B

BAUD rate — The signaling rate at which data is transmitted and received.

bezel — A cover or flange used for mounting or holding an item in place.

bit — Abbreviation for binary digit. In software, a unit of information represented by either a zero or a one. In data transmission in electronic computers, (1) a single occurrence of a character in a language employing exactly 2 kinds of characters; (2) a unit of storage capacity of a storage device with logarithm to the base 2 of the number of possible states of the device.

bus — One or more conductors used for transmitting signals or power from one or more sources to one or more destinations.

byte — A group of 8 bits operated on as a unit.

C

CPU — Central Processing Unit. A computer system's "brain." It's arithmetic, control, and logic elements direct functions and perform computations.

checksum — A value stored in a specific location in the program that is constantly checked to verify there is no corruption in any of the programmed data.

chip — device — An integrated circuit.

coin in count — The number of coins inserted for the game.

coin out count — The number of coins paid out for the game.

coining state — That point in the game cycle when the machine is accepting wager units.

D

device — chip — An integrated circuit.

E

EPROM — Erasable, Programmable Read-Only Memory. Operates in the same manner as a PROM except that the user can erase any program enteered using an ultraviolet light bath. Can be reprogrammed as often as necessary during program design and development, then replaced by ROM for mass production.

G

game state — The mode of operation when the UDPD system sets itself to acknowledge a wager unit which initiates a new cycle *and* to accept the steps necessary for initialization and reading the bookkeeping meters

game over state — That point in the game cycle when the machine sets itself to accept wager units to initiate a new game sequence.

I

I/O — Input/Output. Transferring data into and out of a device.

IC — Integrated Circuit. A combination of inter-connected circuit elements inseparably associated on or within a continuous supporting material.

index — The reels stop spinning.

M

MCU - Microprogram Control Unit. Sequence of instructions corresponding to a computer operation, whose execution is initiated by the introduction of a computer instruction into an instruction register of a computer. Often used in place of hard-wired logic.

MPU — Microprocessing Unit. One of several microcircuits that perform the functon of a computer CPU.

monitor — Color CRT (cathode ray tube) for presenting game images and other displays to the player or casino personnel. (Used on video games.)

P

port — A chip that transfers 8 bits (1 byte) of data.

R

RAM — Random Access Memory. Stores binary data bits as electrical charges in transistor memory cells. Can be read or modified through the CPU. Stores input instructions, results, and other constantly changed data. When power is removed, memory is erased unless a "safeRAM" (battery powered backup) is provided.

ROM — Read-Only Memory. The binary on-off bit pattern containing the program is set into the ROM during manufacturing, usually as part of the last metal layer placed onto the integrated circuit. ROM is not erasable.

S

SDS — Slot Data System. On-line slot monitoring and accounting system. SDS monitors, measures, records, and reports all phases of slot activity as they occur on the casino floor.

Sensor — A group of optical switches operating together to provide the CPU with information on a certain input.

state — Designates a particular mode of operations.

synchronous — Operations that are based on a system clock for timing. The 6800 chip needs the E signal for timing. (Compare with asynchronous.)

T

toggle — The jackpot indicator lamps alternate between the upper and lower displays.

U

UART — Universal Asynchronous Receiver Transmitter. A programmable serial communication chip.

UDPD — Universal Double Progressive Display.

V

valid wager — A wager unit accepted by the machine when the door is closed.

Vcc — The 5.0 VDC used on the printed circuit boards.

VDC — Volts direct current.

W

wager unit — Any coin, token, or credit that represents the player's stake.

Appendix 3.

Machine Options

Double Progressive Operation

The BALLY System Double Progressive Display consists of two basic components; the Prudent Progressive Control Board, and the 16-Digit Progressive Display Board. The control board computes both "upper" and "lower" progressive jackpot amounts based on the initialized values. Initializing various parameters for the double progressive operation requires the BALLY keypad. The display board shows the "upper" and "lower" progressive jackpot amounts simultaneously. When a specified winning combination occurs with the required number of coins wagered for that game, the player wins the "upper" or "lower" progressive jackpot indicated by the glowing lamp. See FO-5110 System 5000 Double Progressive Operator Instructions Manual.

Slot Management System Operations

The BALLY Slot Management System (SMS-5000) consists of the BALLY SMS-5000 program used with the NEC Hand Held Unit and the SMS-PC program used with and IBM PC or compatible computer. The SMS retrieves meter data from the machine and transfers this data to a personal computer where the data can be analyzed and stored. Also, the SMS sets options on either the machine or the PC and transfers these options between the machine and PC. See FO-5130 System 5000 Slot Management System Operator Instructions Manual.

Link Progressive Operation

Up to 3 Link Progressive systems can be connected through the standard parallel interface. See BALLY Manufacturing Corporation publication FO-650-17 for interface specificatiosn. If selected, the 3 progressives are incremented on each coin accepted and locked up on each of the top 3 pays on maximum coin in for a particular pay table. When a progressive jackpot is won, the machine locks up immediately. The attendant hand pays the amount due the player and actuates the keyswitch to clear the jackpot.

SDS/MISER

The machine is compatible with the Slot Data System (SDS) Micro Integrated Slot Event Recorder (MISER) manufactured by Bally Systems, Reno, Nevada. The MISER is installed in the factory or orderd as a retrofit kit.

Appendix 4.

Related BALLY Publications

FO-5000-1
BALLY 5000 Plus Training And Troubleshooting Manual

This manual is for the senior service technician. With this information, the senior service technician can learn to troubleshoot the boards down to the component level. The manual continues to serve the senior service technician as a reference guide.

FO-5013
BALLY 5000 Plus Traditional and Contemporary Parts Catalog (Wide)

FO-5014
5000 Plus Parts Catalog (Narrow)

Appendix 5.

Lock Installation

To install new locks, see the figures on pages 6-13 and 6-14, and follow these steps:

1. Move the spring from the top of the door lock slide to the bottom. (*Figure 6-A*).

— CAUTION —
Move the spring before removing the no-lock plate so that if the door is closed, it can be opened.

2. Remove the no-lock plate. (*Figure 6-A)*
3. Install the lock.

   NOTE: When installing the lock mechanisms, check that no wires are pinched causing short circuits.

4. List all problems that cannot be corrected. Contact your BALLY distributor.

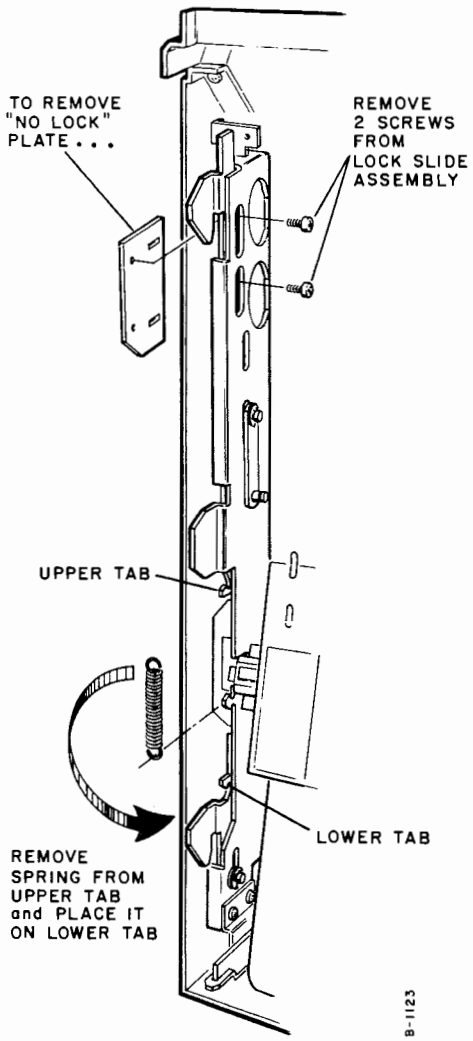
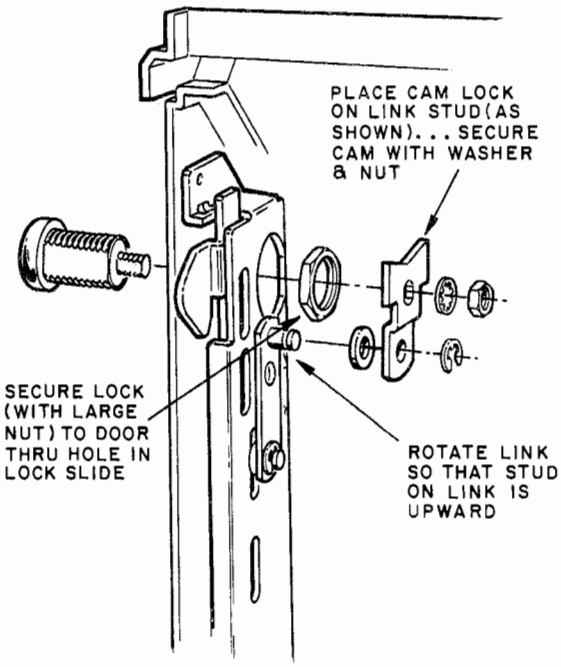


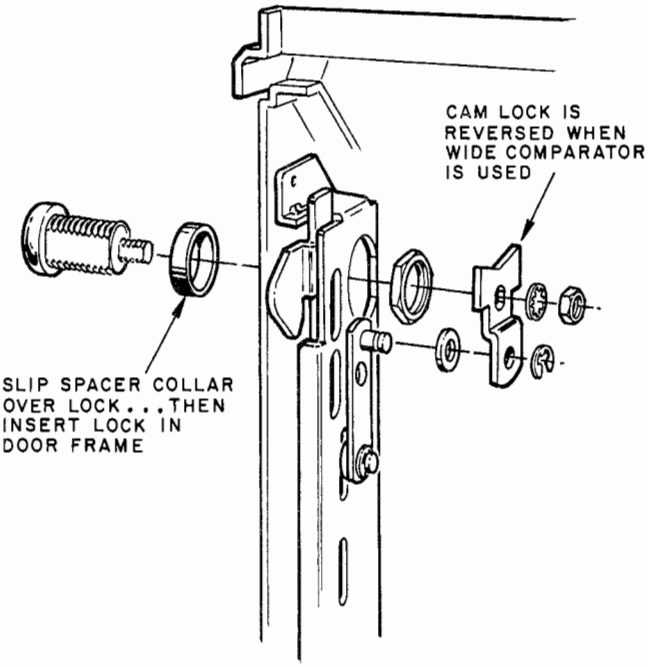
Figure 6-A. Door Lock Installation

NOTE: BEFORE INSTALLING LOCK, REMOVE "NO LOCK PLATE" FROM THE LOCK SLIDE ASSEMBLY

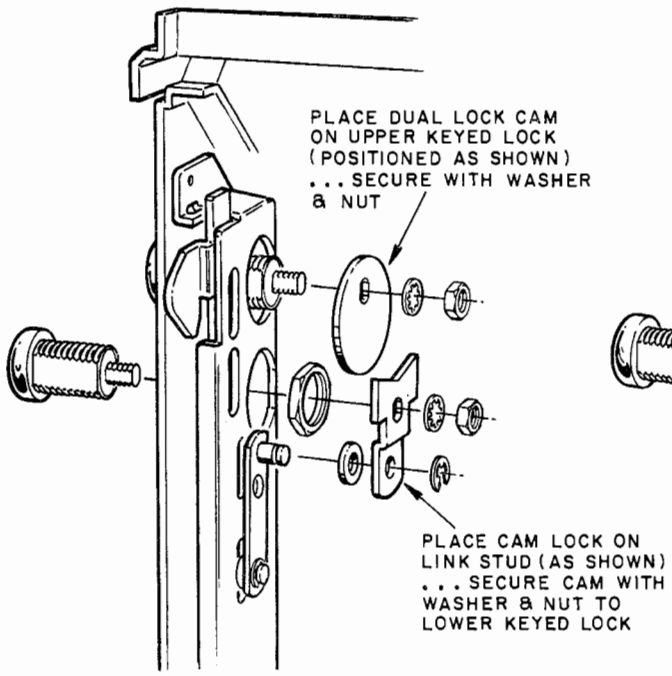
SINGLE LOCK



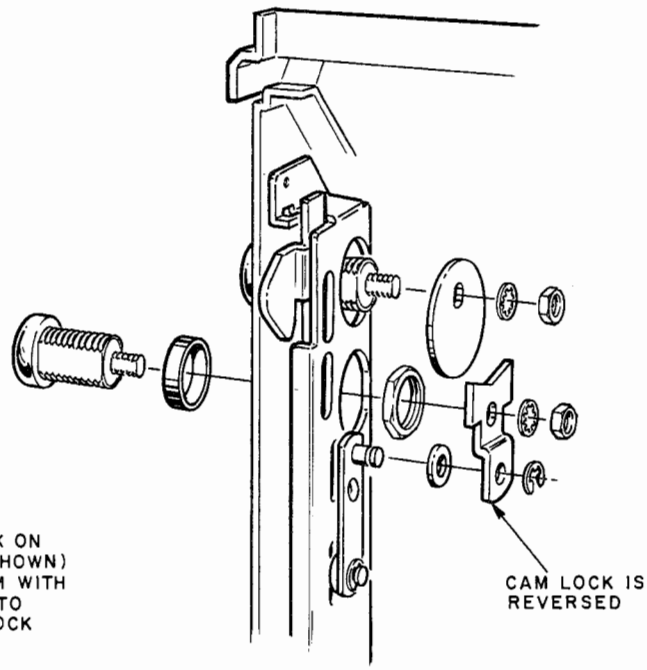
SINGLE LOCK - WIDE COMPARATOR



DOUBLE LOCK



DOUBLE LOCK - WIDE COMPARATOR



C-1156

COIN MECHANISMS INC.

COIN COMPARITOR

CC-62-C and CC-62-A COIN COMPARITOR WITH "B" STYLE INTERFACE

The 62-A Comparitor is a specially designed system offering the most positive coin accepting capability currently manufactured. However, proper use of this unit requires special machine software to correctly read this Comparitor's signals. Unlike the CC-40 and CC-50 series Comparitors, the CC-62-A does not determine a valid coin. Instead, it delivers two separate "Coin Sensing" signals to the machine which allows the software to determine a valid coin. These two signals are defined as:

1. Coin sense signal from Comparitor coils
2. LED sense signal from coin accept track.

These two features offer several advantages to the machine's coin handling capability:

1. It allows the machine to Pre-count valid coins to increase its capability of protecting against "over-coining".
2. It protects against "Piggy-Back" slug validation because no coin sense signal would be generated.
3. Decreased signal sampling rates and specially positioned optics offer edge-to-edge coin handling and validation. The most precise form possible.

An additional feature of the CC-62-A is a third signal defined as an "error" signal. This is a separate code delivered to the machine on one line in two separate formats:

1. Reverse coin code for anti-stringing protection.
2. Coin Jam code for indicating optic failure or an actual coin jam in the optic area.

POSITIVE INHIBIT FEATURE

Another unique characteristic of the CC-62-A Comparitor is its Inhibit feature. Unlike earlier models, this Comparitor has the ability to "Lock-out" electronically without having to turn power off to the unit. Therefore, when the Inhibit Signal is delivered to the 62-A, it happens immediately, prohibiting the Accept Coil Only from actuating even if a good coin is sensed by the Comparitor coils. This method of inhibit allows the unit to maintain full power-up so that there is no time delay for Inhibit, and the Sensing lines can still be monitored.

The CC-62-A with correct machine software is unquestionably the fastest, most reliable Coin Comparitor validation system available.

COIN SIZE SPECIFICATION

The CC-62-A Comparitor is capable of handling any coin size from U.S. 10¢ to the 40mm Token. Adjustments to vary denomination are mandatory for proper operation (See denomination adjustments.)

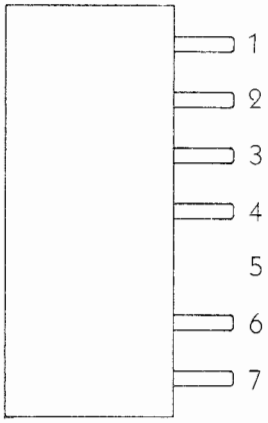
Coin diameter range .705" through 1.575" (17.9mm through 40mm).

Note: For diameter of 1.205" through 1.575" (30.6mm through 40mm), a plug spacer is recommended.

Recommended maximum thickness of coin: .110" (2.79mm).

Coin entry slot control is necesssary for oversize protection beyond .040" (1.02mm) of coin in sample holder.

Note: CC-62-C Coin Comparator contains a coil locking bracket to prevent tampering.



1. GROUND
2. COIN SENSE
3. ERROR
4. CREDIT
5. N.C.
6. +12VDC.
7. INHIBIT

VOLTAGE

The operating voltage for the CC-62-A is 12 Volt DC Only.
Current demand: Idle 50m Amps
Peak 170m Amps

Note: There is NO protective diode on the voltage input line. Therefore, care must be taken not to reverse +12 Volt and ground.

DENOMINATION ADJUSTMENT

Due to the timing parameters required by the machine's software, there are adjustments necessary to allow for optimum coin handling capability. These are separated into two areas:

1. Dampener lever weight specification
2. Rail adjustment

Dampener Weight Specification:

10¢ — No weight used
5¢ — Standard weight (P/N CC-262-A)
25¢ — Standard weight (P/N CC-262-A)
50¢ — Standard weight (P/N CC-262-A)
$ Token — 5/8" weight (P/N X-889)

Rail adjustment:

Proper rail adjustment is mandatory for correct operation of the CC-62-A. To adjust, loosen rail screw (2D) and position bottom of rail (2A) so that you have the full diameter of the coin's width plus 1/32" over. (This allows for smoother coin travel but will maintain correct optic timing for the software to read.) After adjusting rail, make sure to fully tighten the rail screw to hold the adjustment. An adjusting gauge is available from the factory to ease this procedure (P/N CC-62G).

POTENTIOMETER ADJUSTMENT

Each Comparitor leaving the factory is adjusted to give excellent discrimination agains slugs. However, some high quality slugs may need a finer adjustment:

1. Adjust pot CW until high quality slug is rejected.
2. Insert proper coin to ensure proper acceptance.
3. Repeat steps 1 and 2, if necessary.

COIN MECHANISMS INC.

DD-62-A DUAL DOLLAR MECH WITH "B" STANDARD INTERFACE

The Dual Dollar Mechanism is a dedicated system designed specifically to handle Tokens/Ike Dollars for the Casino market. Unlike its Coin Comparitor brother, the Dual Dollar Mech has the ability to handle the large "variety" of Tokens found today, along with the Eisenhower Dollar. As a further technological advance, the 62-A Dual Dollar Mech was created to offer positive coin accepting capability identical to that of its clone the 62-A Coin Comparitor. As a result, the DD-62-A DOES NOT determine a valid coin. Instead, it delivers two separate "Coin Detecting" signals to the machine software for determining a good coin. These two signals are defined as:

1. Coin sense signal from dedicated coil.
2. LED sense signal from coin accept track.

These two features offer several advantages to the machine's coin handling ability:

1. It allows the machine to Pre-count valid coins to increase its capability of protecting against "over-coining".
2. It protects against "Piggy-Back" slug validation because no coin sense signal would be generated.
3. Decreased signal sampling rates and specially positioned optics offer edge-to-edge coin handling and validation. The most precise form possible.

An additional feature of the DD-62-A is a third signal defined as an "error" signal. This is a separate code delivered to the machine on one line in two separate formats:

1. Reverse coin code for anti-stringing protection.
2. Coin Jam code for indicating optic failure or an actual coin jam in the optic area.

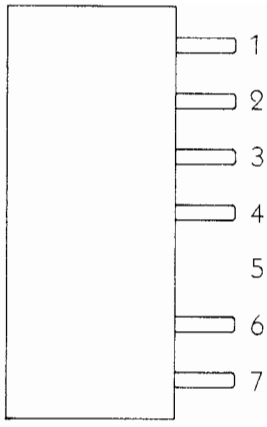
POSITIVE INHIBIT FEATURE

Another unique characteristic of the DD-62-A Dual Dollar is its inhibit feature. This unit has the ability to "Lock-out" electronically without having to turn power off to the unit. Therefore, when the Inhibit Signal is delivered to the 62-A, it happens immediately, prohibiting the Accept Coil Only from actuating even if a good coin is sensed by the dedicated coil. This method of inhibit allows the unit to maintain full power-up so that there is no time delay for Inhibit, and the Sensing lines can still be monitored.

The DD-62-A with correct machine software is unquestionably the fastest, most reliable Coin Mech validation system available.

COIN SIZE SPECIFICATION

The 62-A Dual Dollar is dedicated to the acceptance of Tokens/Ikes.



1. GROUND
2. COIN SENSE
3. ERROR
4. CREDIT
5. N.C.
6. +12VDC.
7. INHIBIT

VOLTAGE

The operating voltage for the DD-62-A is 12 Volt DC Only.
Current Demand: Idle 65m Amps
Peak 265m Amps

NOTE: There is **NO** protective diode on the voltage input line. Therefore, care must be taken not to reverse +12 Volt and ground.

POTENTIOMETER ADJUSTMENT

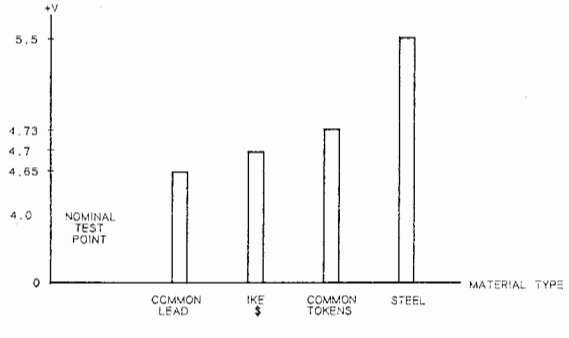
Two Potentiometers allow for proper adjustment of the DD-62-A. Each has a specific task. As shown in the drawing below, the adjustments of both Pots create an "Acceptance Window". This window is defined as the area in which the Voltages (induced by a coin or token) must fall to be a good coin.

PROCEDURE:

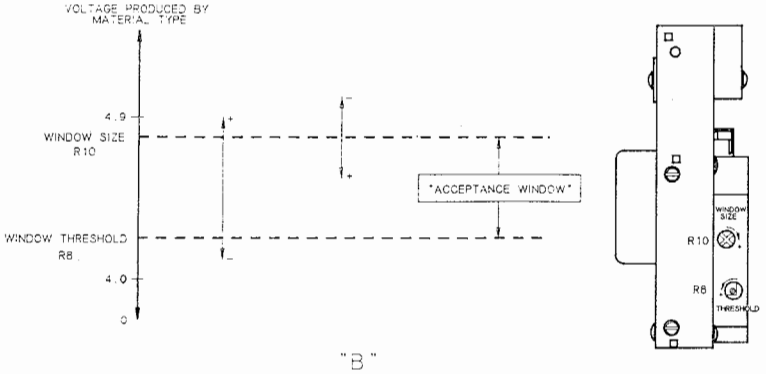
1. Turn both POTs fully CCW.
2. Adjust R8 CW 10 turns and check for lead slug Rejection/Token-Coin acceptance.
   A. If lead accepts, turn Pot CCW until lead rejects.
   B. If token/Coin rejects, turn POT CW until accepted.
3. Adjust R10 CW until you have Token/Coin rejection. Now turn POT CCW approximately 1/8 turn.

Your window should now be set.

NOTE: For best results, the Pot adjustments (fine turning) should be made with the unit In The Mounting Bracket, due to potential window shift caused by the surrounding metal.



"A"



"B"

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- WARNING -

THIS MACHINE MUST BE GROUNDED! FAILURE TO DO SO MAY RESULT IN THE DESTRUCTION OF ELECTRONIC COMPONENTS AND PERSONAL INJURY.

RADIO INTERFERENCE NOTICE: This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the Instruction Manual, this equipment may cause interference to radio communications. As required by FCC regulations, this equipment has been tested and found in compliance with Subpart J and Part 15 of FCC regulations, which are designed to provide reasonable protection against such interference. However, although this equipment complies with all applicable FCC regulations, operation of this equipment in a residential area may cause interference, in which case the equipment user will be required to implement whatever measures may be necessary to eliminate said interference at his/her own expense. BALLY MANUFACTURING CORPORATION is in no way liable for any additional expenses involved with delimination of interference, or for any consequential damages or injuries.

- WARNING -

This equipment is to be installed, maintained, and serviced ONLY by BALLY-trained or BALLY-supervised personnel. All in-the-field modifications must be performed by, or under the supervision of, BALLY personnel. BALLY MANUFACTURING CORPORATION will not be held liable for damages and/or injuries arising from improper or unsupervised equipment installation, modification, or use with equipment not manufactured or approved by BALLY.

This machine is intended for use as a gaming device for amusement only, to be sold in jurisdictions permitting such devices. Distributors, owners, operators, and users are not to modify the machine for any other use. BALLY MANUAFACTURING CORPORATION will not be held liable for damages and/or injuries resulting from any such modification.

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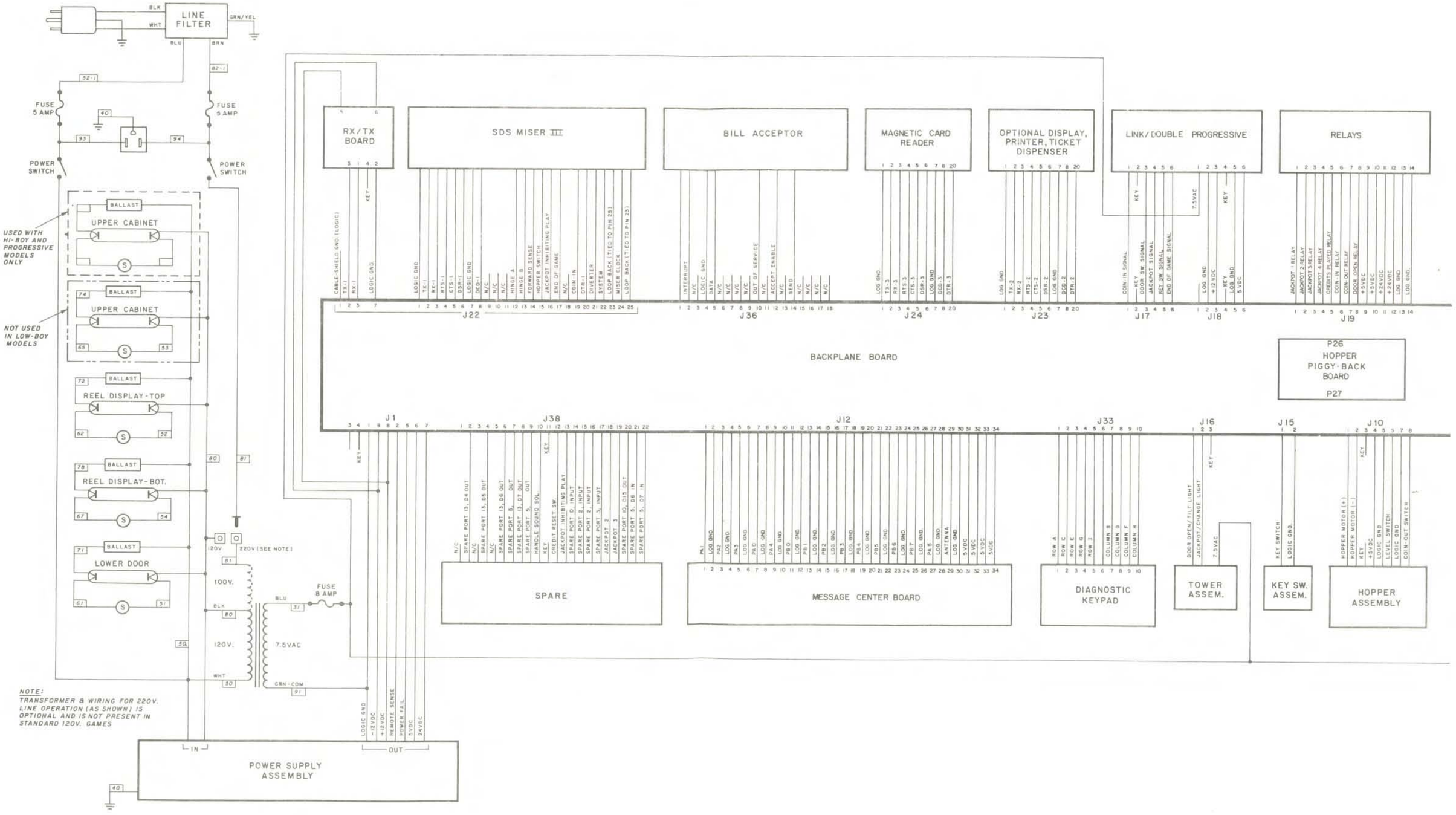
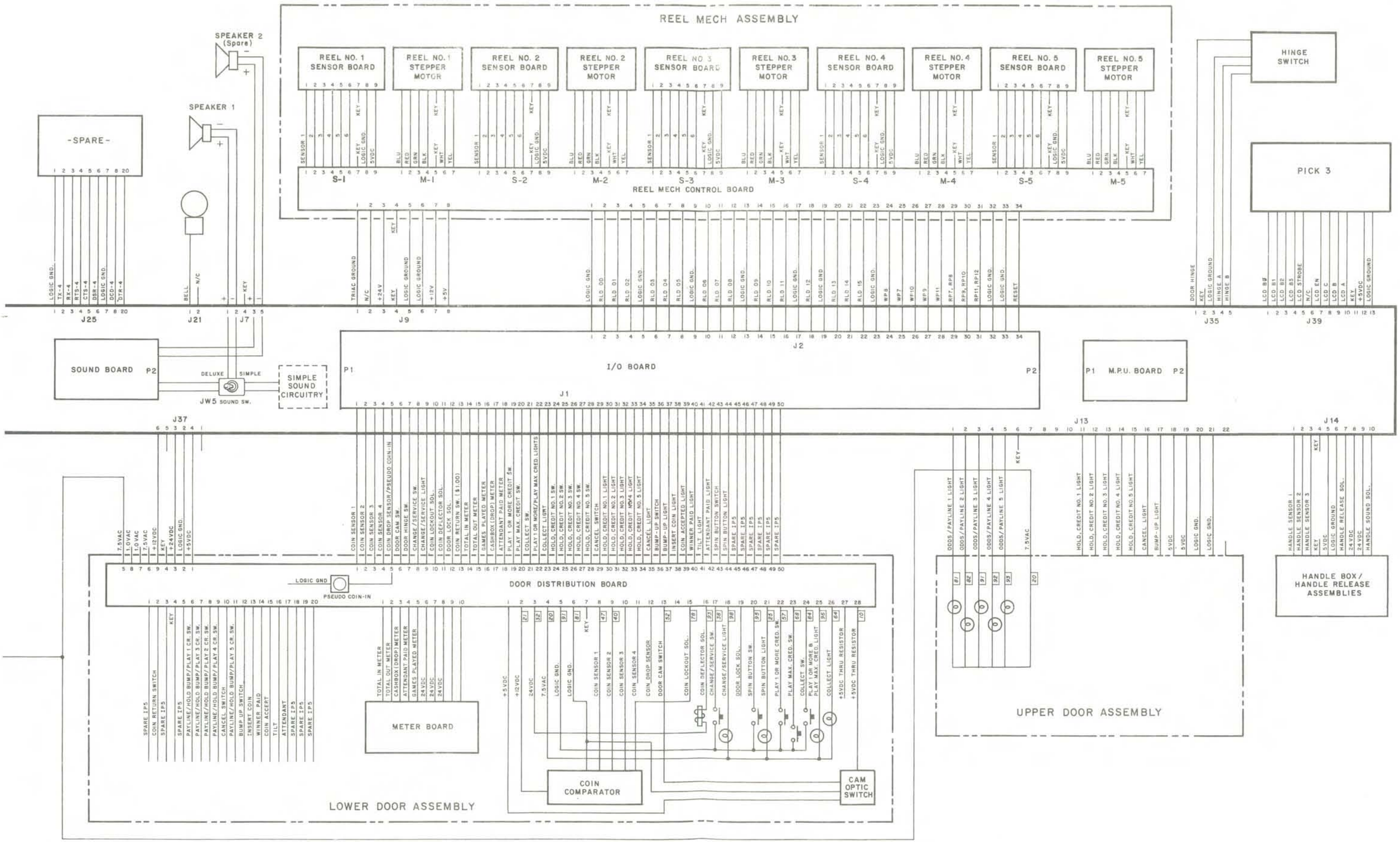
W-1046-3066 Overall Wiring Diagram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