

If flippers are stuck on, check all of the above and then also check 7402 chip on logic board (see Fig. 7).

Solenoid Always off:

If all solenoids are always off, check the solenoid fuse.

If a single solenoid is always off, follow the test procedure for "SOLENOID STUCK ON".

Also, check the wiring and the pin-outs on the solenoid connectors.

ENCODER; TEST #4

Important: If the encoder is not properly adjusted and aligned, it may not be possible to operate the game. The encoder must read the numbers shown in Fig. 8 for the North, South, East and West positions.

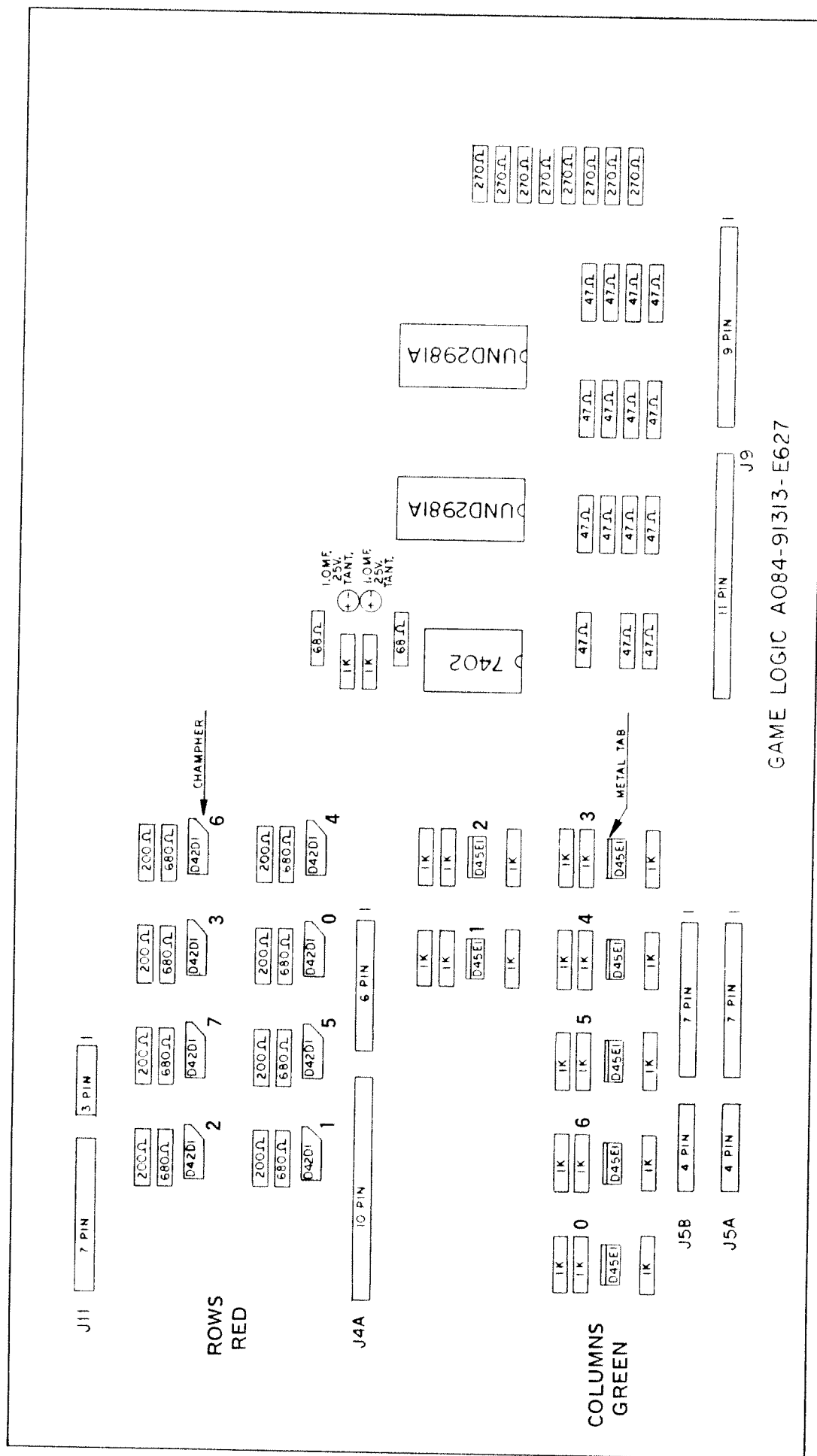
If the number is off and the optical switch sees blank space instead of the reflector, the game will go into a no-operation mode. In this mode, the game will not turn, nor will it eject the ball from the out hole.

To adjust the angle encoder, do the following:

1. There are set screws located below the angle encoder P.C., holding the shaft of the encoder in place. Loosen these set screws so that the shaft can be moved easily by hand.
2. Move the table to North, South, East or West position (see Note on next Page).
3. Put the game into the encoder test mode.
4. Adjust the encoder shaft by hand till you read the proper number in the display.

The numbers should be, depending upon your position, as shown in Fig. 8:

FIG. 7



ALL CAPS ARE 50V AXIAL LEAD CERAMIC
UNLESS OTHERWISE SPECIFIED

FIG. 8

NORTH	00
EAST	20
SOUTH	40
WEST	60

5. Carefully, retighten the set screws, using the encoder test. Make sure that you read the right number corresponding to the four positions. If you find you are still off, repeat the above procedure.

NOTE: To make sure that you are on NORTH, SOUTH, EAST or WEST position, use Test #6 (Table Positioning) which will indicate when you are exactly homed in.

DISPLAY; TEST #5

Bad Digit

If the same order digit on each of the five displays is malfunctioning, then run Test #1 and follow the procedure outlined to determine defective column driver. Check the TIP 140 transistors on the display board.

NOTE: Malfunction implies digit off or digit on very brightly. If a single digit is out or a segment from a digit, replace the L.E.D. block that the digit is on.

Missing Display

Check the display fuse on the power supply.

Check out the jacks corresponding to the displays.

TABLE POSITING; TEST #6

No Reading

1. Make sure that the jack going to the table positioning P.C. has not been yanked off.
Also make sure that the encoder jack is on properly.
2. Check the reflector brackets which are mounted in the game cabinet near the bottom.
There are four of these, one for each position. Make sure that these are placed perpendicular to the optical devices on the table positioning P.C.

FACTORY PRESET; TEST #8

This is not really a test but it sets all the game options and features to a predetermined value. The exact values are shown in the "How To Use The Cocktail Pin Keypad".

GENERAL CONSIDERATIONS

SOUNDS ("E" VERSION LOGIC BOARDS)

Loud Hum:

1. Make sure that the sound amplifier chip (LM 383) is properly grounded (pin 3).
2. Check to see if the chip is making good contact with the heat sink.
3. Make sure grounds are isolated. You can do this by unplugging all the jacks that go to the logic board. Using a VOM with ohms setting RX1, measure from the case (or pin 5) of the LM 383 to logic ground. You should read 100 ohms or more. If you read 100 ohms or less, check for shorts between power and logic grounds.

No Sound:

1. Make sure sound amplifier chip is getting power (Pin 5, 10V unregulated).
2. Check to see that the speaker jack is inserted properly.
3. Turn volume pot up.

SOUNDS ("G" VERSION LOGIC BOARDS.)

Loud Hum:

1. Make sure that the sound amplifier chip (LM 377) is properly grounded (Pin 3,4,5,10, 11, 12).
2. Check to see if the chip is making good contact with the heat sink.
3. Make sure grounds are isolated. You can do this by unplugging all the jacks that go to the logic board. Using a VOM with ohms setting RX1, measure from the case (Pin 3,4,5,) of the LM 377 to logic ground. You should read 100 ohms or more. If you read 100 ohms or less, check for shorts between power and logic grounds.

No Sound:

1. Make sure sound amplifier chip is getting power (Pin 14, 20V. unregulated).
2. Check to see that the speaker jack is inserted properly.
3. Turn volume pot up.

GENERAL LAMPS

No General Illumination:

Check fuse on power supply.

Check main line fuse.

MOTOR SPEED

Motor Will Not Turn

1. Check the fuse on motor speed board.
2. Check the solenoid fuse.

3. Make sure table is not jammed-up by loose cabling, etc.
4. Check wiring to motor speed board and to motor making sure that the female clips which are inserted on the motor, are making proper contact.

NOTE: Make sure that of the two clip on leads that go to the motor, the black one is on the outside and the red on the inside.

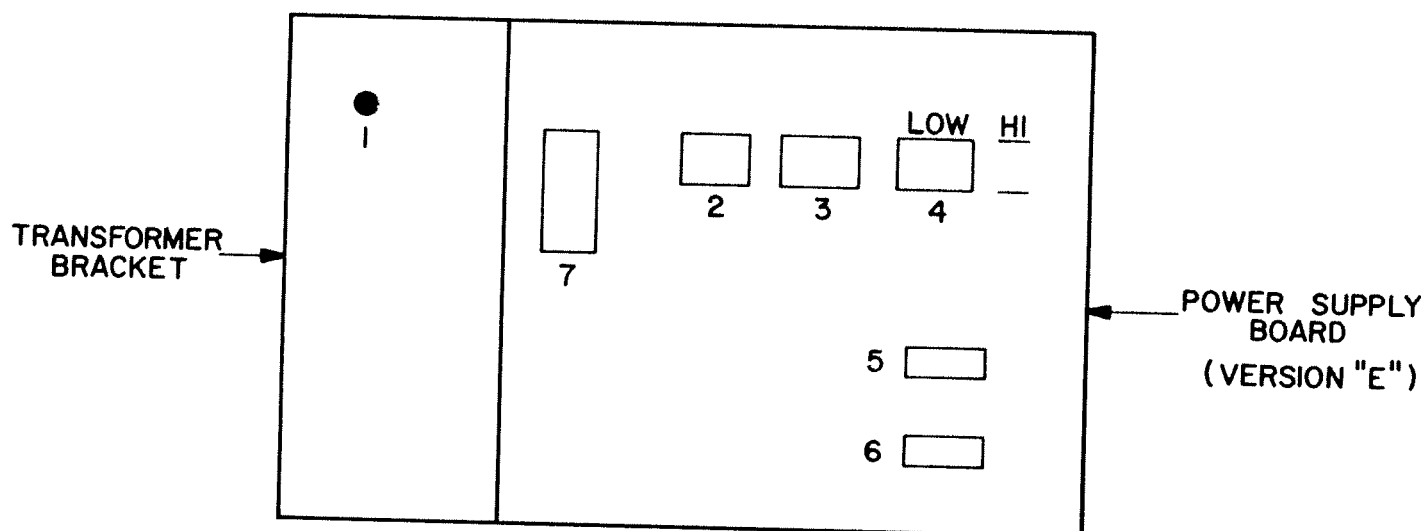
GAME DOES NOT POWER UP PROPERLY

1. Check line fuse.
2. Make sure that power supply is operational. Check the power supply voltage, especially those going to the logic board.
3. Remove the character board. Make sure that the ROMs are seated in their sockets properly and that no pins are bent.
4. Mount the characterization card back in the logic board connector, taking care to see that it is leveled firmly against the logic board.
5. Check the primary of the transformer to ensure that it is getting A.C. voltage from outside.

CAUTION:

In trouble shooting the game, if you find that solenoids energize and stay on, then it is advisable to disconnect the solenoid jack from the logic board.

FUSE LOCATIONS



1	Power Line Fuse	120/220 Primary	2 A Slo Blo
2	Display Fuse	+8 Vled.	4 A
3	Feature Lamp Fuse	+22, +12	6 A
4	Solenoid Fuse	+48 Sol. & Mot. (22)	4 A Slo-Blo
5	Logic Fuse	+5, -5, Unreg. +5 +10	2 A Slo-Blo
6	General Lighting Fuse	5.5 Vac.	8 A
7	Motor Speed Fuse	+48 V.	½ A Slo-Blo

NOTE: ½ A Slo-Blo, mounted on motor speed. (Version "D" only).

* 4 A Slo-Blo, can be mounted low or high voltage for solenoids.

HOW TO USE COCKTAIL PIN KEYPAD

1. To bring keyboard to either coin door, push "red" button mounted on coin door. This button is only active in the game/over condition.
2. THE "game computer" WILL NOT rotate the playfield if the ball is not in the outhole.
3. **WARNING:**
Do not move the playfield by hand with the ball in the shooter.

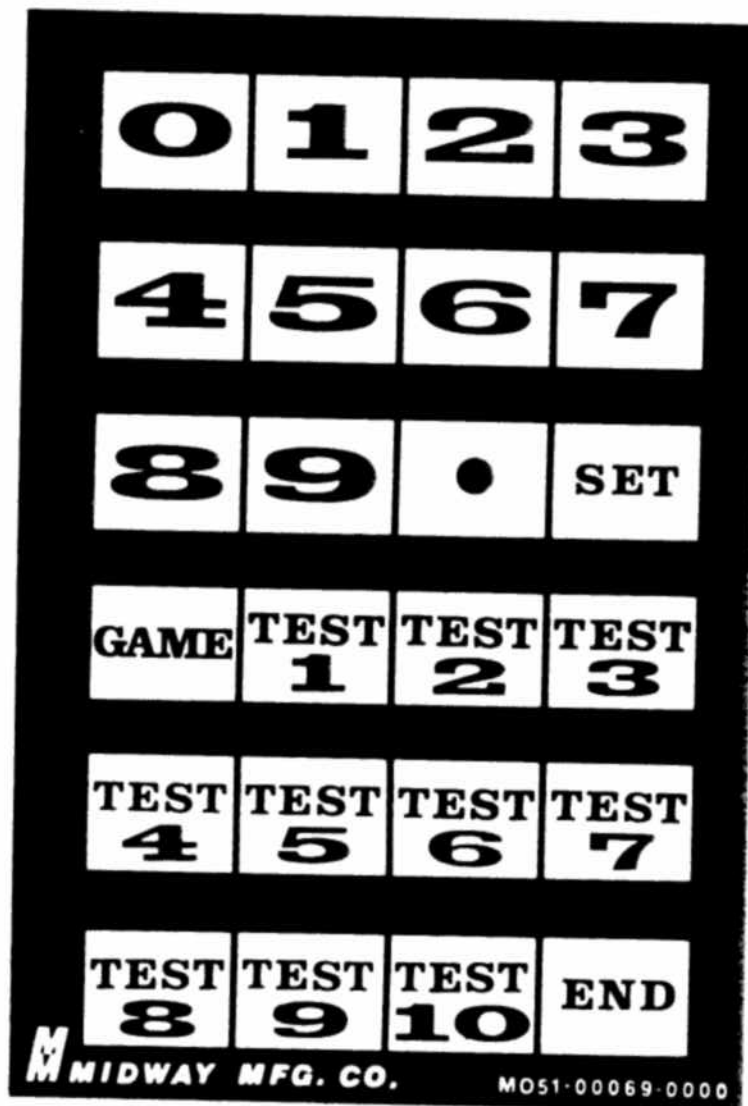


FIG. 1

The keyboard can only be used when the game is in "game over".

The keyboard is used to display and modify operator settable features.

See Figure 1.

TO DISPLAY a feature:

1. Press "end" key.
2. Press "set" key; player displays 1 to 4 should go blank.
3. Press "dot" key.
4. Press numbered keys (0 to 9) until desired feature number, see page 28, is displayed in "match/ball in play" window.
5. Press "dot"; current value of desired feature will appear in players 1 to 4 displays.

NOTE: If a feature number larger than the last number listed on page 29 is entered, game will return to the "game over" still state.

Example:

To display feature number "10":

Press: "end", "set", "dot", "1", "0", "dot"

If you do not wish to change value:

Press "game" key, if you are done.

Press "end" key, if you want to check another feature.

6. ***TO MODIFY*** feature value, press number keys until desired number appears in displays 1 to 4.
7. When number is correct:
Press "game" key, if you are done with keypad.
Press "end" key, if you want to go to another feature or do a test.

8. To do a test, press "end" and then press:

"Test 1": Lamp Test (all lamps will lite)
"Test 2": Stuck switch test (page 29)
"Test 3": Solenoid test (page 32)
"Test 4": Encoder readout (page 32)
"Test 5": Digit test (0 to 9)
"Test 6": Optical switch check (page 33)
"Test 8": Nonvolatile Ram setup (page 33)

NOTE: To do another test, do step 8.

9. You can return to the "game over" still state at any time by pressing the "game" key.

LIST OF GAME FEATURES

- 00 Total coins thru chute 1 (north door)
- 01 Total coins thru chute 2 (south door)
- 02 Total plays (payed and free)
- 03 High score to date

NOTE: Features 04, 05 & 06 can be disabled by setting value to 000000.

- 04 First level score award
- 05 Second level score award
- 06 Third level score award
- 07 Total replays (free)
- 08 Current credits
- 09 Credits per coin:

	Credits	Coins	
Enter 11 =	1	1	
Enter 21 =	2	1	
Enter 31 =	3	1	
Enter 41 =	4	1	
Enter 51 =	5	1	
Enter 61 =	6	1	
Enter 71 =	7	1	
Enter 81 =	8	1	
Enter 91 =	9	1	
Enter 52 =	5	2	(2 + 3)
Enter 12 =	1	2	(0 + 1)
Enter 13 =	1	3	
Enter 32 =	3	2	(1 + 2)

Enter any other number = 1 per 1 coin.

- 10 1 = Replay
0 = Extra ball; for beating each score level (04, 05, 06)
- 11 1 = Match feature on
0 = Match feature off

- 12 1 = Credits are displayed
0 = Credits are not displayed
- 13 1 = Game over table mover enabled
0 = Game over table mover disabled
- 14 1 = Plays tunes
0 = Plays single notes only
- 15 1 = Each target is spotted individually
0 = Targets 1/9 spotted with 4/12; Targets 2/10 spotted with 3/11
- 16 1 = 20,000 points for beating a score level and disables features "10"
0 = No points and enables feature "10"
- 17 1 = Bank shot starts at 600
0 = Bank shot starts at 300
- 18 1 = free play
0 = No free play
- 22 Number of balls per game: 01 to 05, any other number will give 5 balls.
- 23 Maximum credits that can be accumulated. Set by operator.
- 24 Number of replays awarded for beating "Hi-Score". Enter : 00 or 01 or 02 or 03.

TEST 2 — STUCK SWITCH

NOTE: The switch number will appear in player displays 1 to 4.

The ball cannot be in the outhole for this test to be able to check all the switches. Do "Test 3" first to put the ball in the shooter.

Switch #	Description
00	CW. Sw. Optical Assy. (Not Seen)
01	CWW. SW. Optical Assy.

Switch #	Description
02	Gray Code
03	Shaft
04	Position
05	Encoder
06	Center T. B.
07	Bank Shot Outlane
10	Spinner
11	8 Ball Target
12	Call East
13	Call South
14	Call North
15	Call West
16	Bottom T. B.
17	Left Flipper Return
20	3/11 Target
21	1/9 Target
22	North Slam
23	North Test Button
24	North Coin
25	North Tilt (If Used)
26	Top Sling Shot
27	Bank Shot Advance
30	4/12 Target
31	2/10 Target
32	
33	

Switch #	Description
34	South Slam
35	South Test
36	South Coin
37	South Tilt
40	Right Sling Shot
41	Outhole
42	5/13 Target
43	6/14 Target
44	-----
45	-----
46	-----
47	-----
50	-----
51	Left Sling Shot
52	-----
53	Right Flipper Return
54	Right Outlane
55	-----
56	-----
57	-----
60	Top T.B.
61	7/15 Target
62	10 Points
63	Break Shot Hole
64	Left Outlane
65	-----
66	-----
67	-----

TEST 3 — SOLENOID TEST

NOTE: Number appears in "Match" window

Solenoid #	Name
40	Outhole
41	Bank Shot
42	Center T.B.
43	Bottom T.B.
44	Top T.B.
45	Top Sling Shot
46	Right Sling Shot
47	Left Sling Shot
50	Break Shot
53	Flippers

TEST 4 — ENCODER READOUT

NOTE: Used to check encoder number for any playfield position. Number is displayed in "Match" window.

Playfield Position (Outhole)	Number
North	00
East	20
South	40
West	60

TEST 6 — OPTICAL SWITCH READOUT

NOTE: Used to check optical switch operation. Number is displayed in "Match" window.

Reading	Meaning
0	Neither Sw. on
1	CW Sw. on
2	CCW Sw. on
3	Both Sw. on (home position)

TEST 8 — NONVOLATILE RAM (NVR) SETUP

The NVR can be set to certain fixed settings by using this test button.

The purpose is to allow an operator to set certain game settings without doing each one separately.

The values are as follows:

North coin chute total:	010000
South coin chute total:	010000
Total plays:	010000
High score:	400000
First score level:	200000
Second score level:	300000
Third score level:	400000
Total replays:	010000
Credits:	00
Credits per coins:	11 (One credit per coin)
Balls per game:	3
Max. credits allowed:	10

1 replay for beating each score level. 3 replays for beating high score to date.

"Free play" is off.

NOTES

This space is provided for personal notes

