

# SYSTEM INFORMATION MANUAL

## ZWACKERY U.R.

*Bally*

MIDWAY MFG. CO.

10601 W Belmont Avenue  
Franklin Park, Illinois 60131  
U.S.A.



Phone (312) 451-9200 Cable Address MIDCO Telex No.: 72-1596

**WARNING**

**THIS GAME MUST BE GROUNDED. FAILURE TO DO SO MAY RESULT IN DESTRUCTION TO ELECTRONIC COMPONENTS.**

**WARNING:** This equipment generates uses, and can radiate radio frequency energy and if not and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a CLASS A computing device pursuant to SUBPART J of PART 15 of FCC RULES, which are designed to provide reasonable protection against such interference when operated in a commerical environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

**ELECTRICAL BULLETIN:** FOR ALL APPARATUS COVERED BY THE CANADIAN STANDARDS ASSOCIATION (CSA) STANDARD C22.2 NO. 1, WHICH EMPLOYS A SUPPLY CORD TERMINATED WITH A POLARIZED 2-PRONG ATTACHMENT PLUG.

**CAUTION:** TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

**ATTENTION:** POUR PREVENIR CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

**Bally MIDWAY**

*Invites You To Use*

**OUR TOLL FREE NUMBERS FOR  
SERVICE INFORMATION CONCERNING THIS GAME, OR ANY  
OTHER BALLY MIDWAY GAME YOU NOW HAVE ON LOCATION.**

**CALL US FOR PROMPT, COURTEOUS  
ANSWERS TO YOUR PROBLEMS.**

**VIDEO**

**PINBALL**

**Continental U.S. 1-800-323-7182**

**Bally MIDWAY**

10601 West Belmont Avenue, Franklin Park, Illinois, 60131

phone (312) 451-8200

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## GENERAL INSTRUCTIONS

### FOR

## Z W A C K E R Y

### INSTALLATION

1. Remove keys from the taped coin return slot and unlock to open the coin box door.
2. Remove four (4) "CABINET LEVELING LEGS" from inside the coin box.
3. Tip the cabinet to the side and remove the shipping cleats from its bottom.
  - Locate the threaded holes - one in each corner - and install the "CABINET LEVELING LEGS" in them.
  - Level the cabinet.
  - When finished, the cabinet should be stable in the upright position.
4. ◦ Unlock and remove the rear access door to gain access to the 3-pronged line cord. Reinstall the rear access door.
5. Connect the 3-pronged line cord to a 3-slot A.C. wall outlet **to insure proper grounding.**
6. The power ON/OFF switch is located:

UPRIGHT MODEL:        On top to the left rear of the cabinet.

**WARNING:** This game uses a switching power supply. Before initially powering up the game or when servicing the power supply, the following service procedure should be used as a safeguard to assure proper operation.

1. NEVER turn on the switching power supply without a D.C. Load on it!
2. Always assure that a minimum 20-25% Load is on the +5V D.C. line.
3. NEVER turn on the supply if you are not sure it is properly connected!
4. NEVER Connect or disconnect the Load with the power "ON".
5. Do not try to exceed its' 125VA power limit.
6. If a clicking noise is heard from the supply - TURN IT OFF IMMEDIATELY and check wiring harness for improper connections.

### TO SERVICE THE CONTROL PANEL

1. UPRIGHT MODEL:
  - The control panel is held in place by two (2) spring clamps which provide constant pressure on the strikes.

**AFTER turning power to the game off,** they can be reached through the coin door.

- To release the clamps, lift up and toward the center of the control panel.
- Once they are released, unhook them from their strikes.
- To remove the control panel:
- Raise it up and tilt it toward you until you can see the cable behind it.
- Cradling the control panel between yourself and the cabinet, disconnect it from its cabling and any miscellaneous hardware.
- The control panel is now loose and may be serviced.
- To reinstall the control panel, reverse this procedure.

#### REMOVAL OF THE MAIN-DISPLAY-GLASS AND/OR THE T.V. BEZEL ASSEMBLY

##### 1. UPRIGHT MODEL:

**NOTE:** In order to do this, the control panel **MUST** be removed first. See the "UPRIGHT MODEL" procedure.

- **Turn the power to the game off** and remove the control panel. This frees the main-display-glass so it can be removed.
- By putting your finger in the hole in the middle of the main-display-glass support, you can lift it up and out.
- Loosen the screws which secure the T.V. bezel-diffuser-clamps in place.
- Move the clamps to the side and the bezel diffuser may be removed.
- Remove the bezel securing screws and the bezel with it's bezel-diffuser-clamps and their screws may be removed.
- To reinstall the T.V. bezel assembly and the main-display-glass, reverse this procedure.

#### VOLUME CONTROL POT / OPTION SWITCH LOCATIONS

The volume control pot is located, along with the credit switch and the self-test switch, just inside the cabinet on the left side of the coin door frame. The option switch is located as shown in the attached P.C. Board reference drawing. For adjustment, it can be reached through the games rear access door.

To make the sounds louder, turn the volume pot clockwise as you face it.

To make the sounds **less** loud, turn the volume pot counterclockwise as you face it.

## GAME OPERATION

Your new game is a one player model with a color T.V. monitor. The game has six possible modes of operation: ATTRACT, READY-TO-PLAY, PLAY, HIGH SCORE/INITIAL, SELF-TEST, and POWER-UP TEST.

### "ZWACKERY" SELF-TEST MODE

The Self-Test mode is designed to check all game switches and computer functions. It is the most complete way of checking for proper game operation and is quite easy to used.

The Self-Test mode may be entered at any time and from any mode of operation. Simply locate the black slide switch inside the coin box compartment and slide it to the Self-Test position. With this switch in the Self-Test position, activate the slam switch located on the coin door. The game will enter the Self-Test mode immediately and display the following test menu....

1. SELF DIAGNOSTICS
2. SOUNDS
3. PLAYER INPUT
4. BOOKKEEPING
5. DIP SWITCH
6. PRESET
7. GRID

MOVE JOYSTICK UP OR DOWN TO SELECT TEST

TRIGGER ENTERS AND EXITS TEST

The trigger is used throughout the entire self-test package to enter and exit all selections except PLAYER INPUT. To exit PLAYER INPUT, activate the coin door slam switch.

1. SELF DIAGNOSTICS: This test is designed to effectively locate and identify any malfunction of the on-board computer. When selected, the game enters this mode immediately and begins scanning the memory stored in rom and ram. If a defective component is found during the scan, that component and it's location will be displayed on screen. It will take about 15 seconds to perform the entire test.
2. SOUNDS: When selected, this test will display a menu of sounds. The first three selections on the menu are ALL SOUNDS THIS PAGE, NEXT PAGE OF SOUNDS and EXIT. If you move the cursor to select ALL SOUNDS THIS PAGE and press the trigger, the game will automatically perform a test of all the sounds on that page only. If you move the cursor to select NEXT PAGE OF SOUNDS and press the trigger, the next page will appear with a new menu of sounds. If you move the cursor to select EXIT, the game will exit the sound test and return to the main menu page. While in the sound test, any selection on the sound menu may be tested individually by positioning the cursor next to that sound and pressing the fire button.

3. **PLAYER INPUT:** This test is designed to confirm the operation of all player inputs and devices in the game. For example, when you wish to test the coin switches on the coin door, you would enter this test and activate the coin switches. If the switches are operating properly, the screen will display the words COIN CHUTE 1 or COIN CHUTE 2 depending on which coin switch has been activated. All inputs, controls, service switches, player selection buttons, etc. may be tested in the same manner. To exit this test, activate the coin door slam switch.
- \* 4. **BOOKKEEPING:** A very useful tool, this test is designed to assist you in tuning your game for your location. When selected, the screen displays a complete and highly accurate account of all games played. The information displayed includes high scores, low scores, coins collected, longest and shortest games played. There is also an extensive score report, time report and rack report that may be accessed by positioning the cursor next to those selections. To exit this test, position cursor next to EXIT and press the fire button.
5. **DIP SWITCH:** All game options such as coins per credit, coins per buy-in and difficulty levels are adjusted through the use of dip-switches located on the C.P.U. p.c. board. When this test is selected, a full display of the current dip switch settings will appear.
- \* For further information, refer to "BOOKKEEPING RECORDS AND HOW TO READ THEM" on pages 6 and 7.
6. **PRESET:** When selected, a menu will appear with four selections. Selecting ALL VALUES will reset **all** numeric values stored in memory. Selecting BOOKKEEPING VALUES ONLY or COIN COUNTERS ONLY will reset only those values indicated. To exit this test, simply select EXIT.
7. **GRID DISPLAY:** This test was designed to display a crosshatch pattern used in adjusting the color monitor. This pattern may be used to adjust convergence, color balance, vertical linearity, and vertical/horizontal size. To exit this test, simply press the trigger.

#### POWER-UP TEST MODE

This test sequence is designed to effectively locate and identify any malfunction of the on-board computer **without** the use of the monitor (useful if the monitor is disabled for any reason). Test results are indicated by an L.E.D. located on the Central Processor Unit (C.P.U.) as shown in the attached P.C. Board reference drawing.

On power-up under normal operation, the processor runs through it's self-diagnostic checks without any L.E.D. flashes. If one of the tests fails however, the processor starts all the tests over, now flashing the L.E.D. to announce every successful test. This allows a quick turn-on if everything is functioning correctly.

**Note:** Immediately after turn-on the L.E.D. flashes. This should not be counted as a test flash.

<u>Flash #</u>	<u>Test</u>
1	Ram 0
2	Ram 1
3	Pia 0
4	Pia 1
5	Pia 2
6	6840 Timer
7	Checksum 0-1
8	Checksum 2-3
9	Checksum 4-5
10	Checksum 6-7
11	Checksum 8-9
12	Checksum 10-11
13	Checksum 12-13
14	Background Ram
15	Color Ram
16	Foreground Ram

#### ATTRACT MODE

1. The Attract mode starts:
  - Just after power has been turned on to the game.
  - After a Self-Test has been completed. (Performing a Self-Test sets the credits in the games memory to zero "0".)
  - After a play has been finished and there are no more credits left in the game's memory.
  - No matter where the game is in the Attract mode sequence, it will immediately go to the Ready-To-Play mode display as soon as a game has been paid for.
  - There is no attract mode sound.

#### READY-TO-PLAY MODE

1. The Ready-To-Play mode starts when enough coins have been accepted for game.
2. The Ready-To-Play mode ends when either the START button is pressed.
3. If the START button is not pressed, the displays will remain on the monitor screen indefinitely.

#### PLAY MODE

1. The Play mode begins when the START button is pressed. The game sound begins at this point.
2. The Play mode ends when all of the pages to Zak's "Book of Life" have been eliminated by the Ghoulum. When this happens, "Your quest is ended. Insert coin to continue this adventure." is written across the center of the monitor screen if no credits remain.

If there are remaining credits, then "Your quest is ended. To continue this adventure, press START button." is written across the center of the monitor screen.

#### HIGH SCORE/INITIAL MODE:

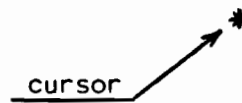
If your score was high enough to become one of the game's best scores, the game will go into the High Score/Initial mode immediately after the "GAME OVER" display. If your score is not high enough to cause the game to go into the High Score/Initial mode, it will either go to the Attract mode (if there are no more credits left in its memory) or into the Ready-To-Play mode (if there are still credits left in its memory).

Follow the ON-SCREEN instructions to enter your initials next to your score in the league of the best players to date.

After the High Score/Initial mode, the game will either go to the Attract mode (if there are no more credits left in its memory) or into the Ready-To-Play mode (if there are still credits left in its memory).

#### BOOKKEEPING RECORDS AND HOW TO READ THEM

Included in the self-test package is a selection called BOOKKEEPING. Various game routines are tallied and temporarily stored in the computer's memory. Using this information, an operator can more effectively set the game parameters, i.e. coins per credit, difficulty level, etc. to custom fit into any particular location. When this feature is selected, a menu is displayed enabling you to choose any one of four individual reports or EXIT.

- 
- \* 1. GAME STATISTICS
  - 2. SCORE REPORT
  - 3. TIME REPORT
  - 4. RACK REPORT
  - 5. EXIT

To view any one of the bookkeeping reports, simply move the joystick up or down until the cursor is positioned next to the selection desired. Then simply squeeze the trigger to display that report. A full explanation of each report follows...

1. **GAME STATISTICS:** When selected, a tally of the various game routines is displayed including some information condensed from the other reports...

**HIGHEST SCORE** - Displays the highest score stored in memory. Games played using the buy-in feature are counted and recorded as one continuous game with one final score.

**LOWEST SCORE** - Displays the lowest score stored in memory. Games played using the buy-in feature are counted and recorded as one continuous game with one final score.

**LONGEST TIME** - Displays the longest game time stored in memory. In cases where the buy-in was counted and recorded as a separate game with a separate game time.



SHORTEST TIME - Displays the shortest game time stored in memory. In cases where the buy-in feature was used, each buy-in was counted and recorded as a separate game with a separate game time.

PLAY TIME HRS. MIN. - Displays, in hours and minutes, the total time spent in the play mode. For example, if 100 games were played, each lasting 3 minutes, the total play time would be 300 minutes or 5 hours and would be displayed as 05 00.

IDLE TIME HRS. MIN. - Displays, in hours and minutes, the total time spent in the idle or non-play mode. For example, if the game was powered on for 8-1/2 hours and the total PLAY TIME was 5 hours, the remaining time or IDLE TIME would be 3 hours and 30 minutes, displayed as 03 30.

TOTAL GAMES PLAYED - Displays the total number of games played. Games played using the buy-in feature are recorded as one continuous game.

FREE BASES AWARDED - This feature is not used in this game.

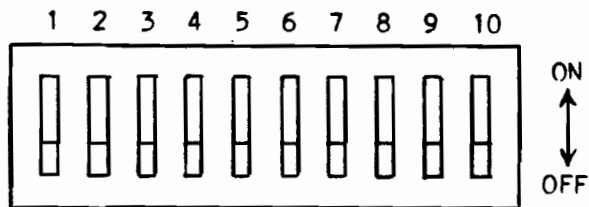
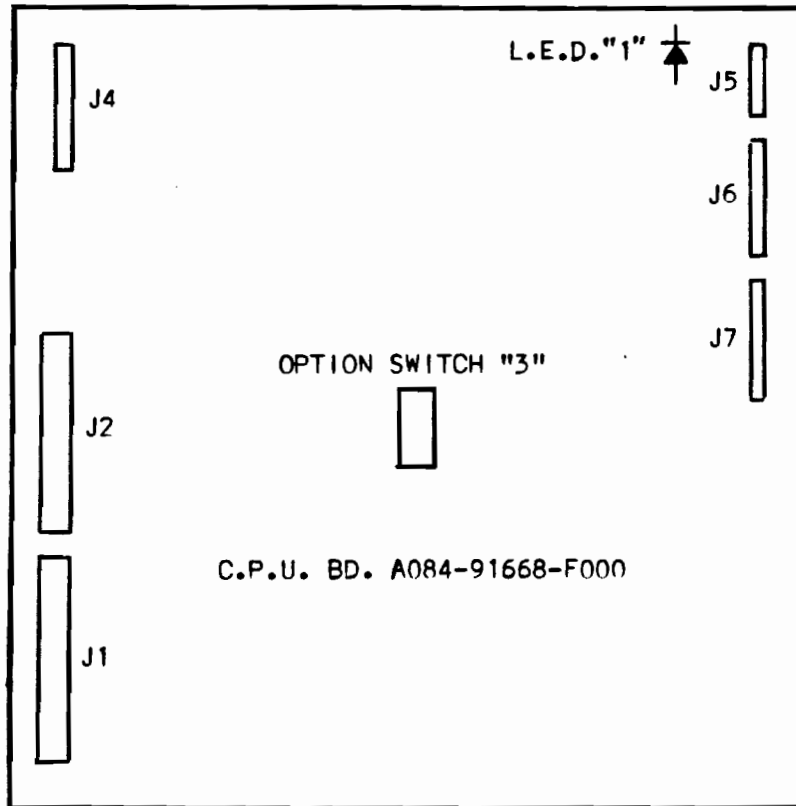
COIN CHUTE 1 - Displays the total number of coins dropped through coin chute 1.

COIN CHUTE 2 - Displays the total number of coins dropped through coin chute 2.

2. **SCORE REPORT:** Displays the games currently stored in memory, separating them into categories by score. Games played using the buy-in feature are counted and recorded as one continuous game with one final score.
3. **TIME REPORT:** Displays the games currently stored in memory, separating them into categories by game time. In cases where the buy-in feature was used, each buy-in was counted and recorded as a separate game with a separate game time.
4. **RACK REPORT:** Displays the games currently stored in memory, separating them into categories by racks achieved. Games played using the buy-in feature are counted as one continuous game and only the final rack is recorded.

**IMPORTANT NOTE:** ALL INFORMATION STORED IN THE COMPUTER'S MEMORY WILL BE LOST WHEN POWER TO THE GAME IS INTERRUPTED.

C.P.U. P.C. BOARD REFERENCE DRAWING



Z W A C K E R Y

OPTION SWITCH SETTINGS

//////////////////// SWITCH NO. 3 - AT C8 - LOCATED ON C.P.U. P.C. BOARD //////////////////////

FREEZE MODE				<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>	<u>SW#9</u>	<u>SW#10</u>
*	NORMAL			OFF	NOT								
	FREEZE VIDEO			ON	USED								
COINS PER CREDIT				<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>	<u>SW#9</u>	<u>SW#10</u>
*	1 COIN	1 CREDIT			OFF	OFF	OFF						
	2 COINS	1 CREDIT			ON	OFF	OFF						
	3 COINS	1 CREDIT			OFF	ON	OFF						
	4 COINS	1 CREDIT			ON	ON	OFF						
	5 COINS	1 CREDIT			OFF	OFF	ON						
	6 COINS	1 CREDIT			ON	OFF	ON						
	1 COIN	2 CREDITS			**OFF	ON	ON						
	FREE GAME				ON	ON	ON						
COINS PER BUY-IN				<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>	<u>SW#9</u>	<u>SW#10</u>
*	1 COIN	1 BUY-IN						**OFF	OFF	OFF			
	2 COINS	2 BUY-INS						ON	OFF	OFF			
	3 COINS	3 BUY-INS						OFF	ON	OFF			
	4 COINS	4 BUY-INS						ON	ON	OFF			
	5 COINS	5 BUY-INS						OFF	OFF	ON			
	6 COINS	6 BUY-INS						ON	OFF	ON			
	7 COINS	7 BUY-INS						OFF	ON	ON			
	NO BUY-IN							**ON	ON	ON			
DIFFICULTY LEVEL				<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>	<u>SW#9</u>	<u>SW#10</u>
*	NORMAL											OFF	OFF
	HARDER											ON	OFF
	HARDEST											OFF	ON
	EASY											ON	ON
* INDICATES FACTORY RECOMMENDED SETTINGS										PART NO. M051-00385-A007			

\*\*When "Coins Per Credit" function switch setting is for 1 Coin/2 Credits , "Coins Per Buy-in" function will (unless disabled) automatically default to 1 Coin/1 Buy-in. "Coins Per Buy-in" function is disabled when it's switch setting is for No Buy-in .