Bally – United – Keeney – Williams

MULTI-BINGO

OPERATING INSTRUCTIONS AND PARTS CATALOG

Part numbers are marked on illustrations and a list of miscellaneous parts appears on back cover.

FOR QUICKEST SERVICE

Specify correct part number
when ordering parts

INSTALLATION INSTRUCTIONS

Fasten 4 legs to cabinet with bolts furnished. Place backbox in position. Unlock and open back-door and fasten the backbox to cabinet with bolts and washers furnished.

Plug power line into 110-120 volt 60 cycle Alternating Current only. Verify power to monitor, computer, and network switch are secure after movement. Examine plugs for Playboard selection, as well as cabinet and Playboard plugs to ensure all are secure. If optional drawer is attached, ensure that plug is secure in the head. Auxiliary power must be connected via service outlet in the head. Turn on power by turning toggle-switch on. Toggle-switch is located on bottom right of cabinet.

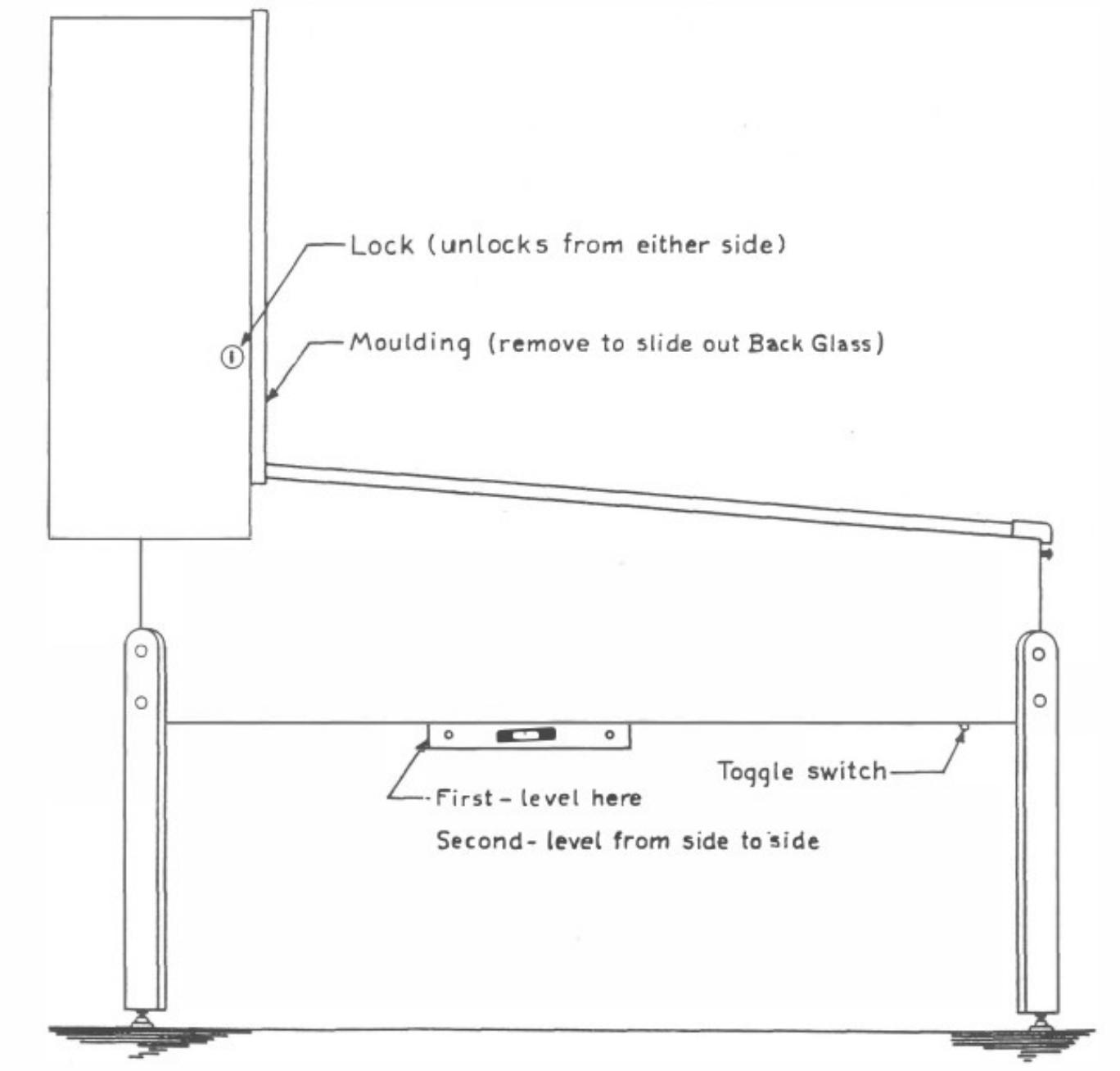
ACCESS TO MECHANISM AND LIGHT BULBS

Back-glass may be removed from either side by unlocking the side desired and removing the upright moulding. (Remove moulding by pulling bottom right front of head.)

After removing back-glass, the light panel can be removed and access to mechanism may be obtained by removing monitor from head (removing eight screws and four blocks), or simply opening back door. Mechanisms are placed for serviceability from the back door position. Unlike electro-mechanical games, switch adjustments are not necessary from the light panel.

BE SURE TO LEVEL GAME

See instructions for leveling below. Place 8 (1 1/8") balls in game.



MULTI-BINGO GAME OPERATION

1. When power is applied, game will boot to a menu.
2. Use Left and Right buttons on footrail to select a game. Games are listed in chronological order.
3. Once game desired is shown, press the R button on the footrail to enter the chosen game.
   (a) If game asks you to change Playboards:
      1. Open the back door
      2. Unplug the three Playboard plugs
      3. Lift the Playboard
      4. Unplug the HDMI cables to the score and instruction display computers
      5. Remove Playboard.
      6. Install new Playboard by reversing the above steps.
      7. Move backbox adjustment plug to select new Playboard.
4. Game play proceeds as indicated by score and instruction displays.
5. Free play can be toggled on and off via switch located to the left of the total play meter inside the coin door.
6. Pressing switch located on the left of the cabinet will remove credits.
7. To return to the menu, hold down Left and Right buttons on footrail and press R. The screen will be black while the games are loading.

MAINTENANCE AND ADJUSTMENT

1. GENERAL

NEVER EXPERIMENT with any of the mechanisms or computer boards. Locate any trouble with the aid of Wiring Diagrams or Operating & Servicing Information supplied with the machine, then check for proper adjustment of the units involved before making any changes to the game code itself. Improper adjustment or makeshift repair will only cause serious damage to other parts of the machine or repeated failure of the part.

> NOTE: Always look for a possible loose wire, bad connection at computer board plug, jones plug or socket or unhooked springs on step-ups, relays, etc., before adjustments are made or wires connected.

2. FUSES

IMPORTANT: Never replace fuses with any rating other than specified on the schematic, fuse block, or driver board. Fuse block is mounted on transformer board assembly in the backbox, and driver boards are located on the back door.

3. LUBRICATION

Over-lubrication causes far more trouble in coin-operated equipment than under-lubrication. Practically all cases of poor contact on switches is due to oil or grease, or oil vapor which forms a film or residue on the contacts and will not allow current to pass through.

IMPORTANT: NEVER USE VASELINE FOR LUBRICATION OF ANY PART OF THE MACHINE. Vaseline is not a true lubricant. It leaves a dirty and gummy residue and it becomes very thick when cold. A special Coin Machine Lubricant is supplied with each machine.

Solenoid Plungers should not have a lubricant of any kind. Should there be a sluggish tendency or if plungers are sticking, the parts should be cleaned with a solvent and flaked graphite applied on reassembly.

4. CONTINUITY CHECKS

Continuity of coils, contacts, wire connections, etc. may be checked with an Ohmmeter or several types of Test Lites. If regular equipment is not available, an efficient Test Lite may be made from a few miscellaneous parts. The following paragraphs describe this equipment and give information that will prove helpful to the service person.

(a) Battery Test Lite should be used only with all current in the machine tuned OFF. When the leads from the Lite are places across the wires leading to the Coils, Switches, etc., the bulb will light if there is contact through the unit being checked. If the bulb does not light, there is a break in the circuit. However, only open circuits on coils may be located by this method since shorted coils will also show contact through the coil. If a short is suspected, use the Test Prod to check the coil.

(b) The Test Prod must be used with current turned ON. The clip on the end of the lead wire may be attached to any common ground line in the machine. This would be any Green wire in the machine. The prod end of the tester may then be touched to

various connections or contact points in the circuit being checked. Using the tester in this manner leaves the service person with one hand free to manually operate relays or other units.

If a particular Coil on a Relay, Solenoid, etc., is not energized, place the clip end of the Test Prod on the ground side of the coil. Touch the test prod to the opposite side of the coil (Red for 48VDC, Yellow for 5VDC). If the bulb lights but the Relay Coil, or other unit being checked, is not energized, then the coil is faulty and must be replaced.

Broken Wires may be located by placing the leads of the Battery Test Lite on each end of the wire in question. If the bulb fails to light, a break in the circuit is indicated.

5. RELAY ADJUSTMENTS

All Relays are adjusted by the factory and should require little or no servicing in the field. Should a Relay fail to actuate the Unit or Lights to which its switches are connected, the difficulty might possibly be due to dirty Switch Contacts, loose wires or a broken wire between the Relay and other Units.

> NOTE: DO NOT make any adjustments to the Relay itself until all other possibilities in the troublesome circuit have been checked.

The Gap between the Coil and the Armature of the Relay should be approximately 3/64 of an inch. This allows for about 3/32 of an inch movement at the end of the Armature into which the switch blades are inserted. The Gap may be adjusted (if necessary) by bending the short switch leaf.

CAUTION: The Armature Stop Arm on all Relays is carefully adjusted at the factory. Do not change this adjustment unless absolutely necessary.

The Armature Spring should have enough tension to bring the Armature against the Armature Stop Arm when the Relay is not energized. SEE THAT PRESSURE, FROM POORLY ADJUSTED SWITCHES, IS NOT AFFECTING THE ARMATURE BEFORE ATTEMPTING ADJUSTMENTS ON THE SPRING.

If a Relay "chatters" or "hums", but does not pull in, check to see that switches, located on it, are not out of adjustment and causing too much tension on the Armature or that a burr on top of the Relay Coil is not interfering with the action of the Armature. Burrs on the core of the Coil may be removed with a small contact file.

The Continuity of the Relay Coil may be checked with an Ohmmeter, or if one is not available, see Paragraph 4 for use of Test Prod.

6. SWITCH ADJUSTMENT - GENERAL

The majority of switches used in this machine are composed of a series of blades and spacers built up with normally open and/or normally closed contacts as required to perform the specific function for which the switch is intended. These switches may be actuated by Relays, Solenoids, or by other mechanical factors. However, the adjustment of the switch contacts and blades remain fairly constant, as shown in the following paragraphs.

With the exception of a few cases, in which special adjustment instructions are given, all blade type switches should have at least 1/32" gap beyond the point at which the contacts close. This follow-thru action provides a wiping motion between the contacts, keeping them clean and insuring good contact between the points.

When adjusting blade type switches, first adjust the blade actuated by other parts of the machine with relation to the part it contact and then set the gap and follow through. Specific instructions pertaining to each switch are given, where necessary, in other paragraphs and may be found by referring to the index.

CAUTION: NEVER BEND BLADES SHARPLY, at the spacers or otherwise. Sharp bends tend to straighten out slightly with use, and will weaken the Blade. Blades should be formed by a stroking action over the entire length of the blade, using a blade tool or duck-bill pliers.

7. SWITCH ADJUSTMENTS - PLAYBOARD POCKET

All Pocket Switches are mounted either underneath the Masonite Shuffle-board or on the Masonite Shuffle-board, and can be easily serviced by removing the screws on the edge of the Playboard and raising the front end as far as desired, or by removing the clips that hold the Masonite Shuffle-board in place, allowing the Masonite Shuffle-board to hinge downwards.

Check to see that combined tension of the blades keeps the ball 3/16" above the masonite when it drops into the pocket. If the switches are not adjusted properly, a second ball may hang up in saucer around ball pocket.

8. SWITCH ADJUSTMENT - RELAY

GENERAL - Unless special instructions are given, all blade-type switches mounted on relays should be adjusted according to the instructions for General Switch Adjustments as given in Paragraph 6.

9. SWITCH ADJUSTMENTS - TILT

SLAM TILT switches are the blade type switch with one blade weighted. Rough handling of the machine will cause the weighted blade to vibrate, closing the switch contacts and Tilting the mechanism. The gap between points on these switches may be set as close as desired (depending on how rough the Players treat the machine). Average gap for this type of switch is approximately 1/16". However, closer settings will soon discourage rough players.

THE PENDULUM TILT, located in the front left corner of the cabinet (alongside the cash-box) can be set by loosening the thumb screw and sliding up or down or moving the ring forward or back.

10. SWITCH ADJUSTMENTS - BALL SHOOTER

The Ball Shooter Switch is located directly ahead of the Ball Shooter Plunger on the Playboard and is operated by the weight of the Ball resting on the small wire form that protrudes through the Playboard. Be sure the wire form is not rubbing the sides of the opening and that its movement is great enough to operate the switch. Also, check to see that the wire form is not bent back far enough to be struck by the plunger during play. The contacts on this switch should have at least 1/32" gap and 1/32" follow-through.

WHAT TO DO IF:

I. Lights are out, game is inoperative:
   1. Check A.C. cord and plug for breaks, cuts or other damage.
   2. Check fuses, located on transformer panel inside back door.
   3. Check master switch, in cabinet bottom under right front of cabinet.
   4. Check plugs and jacks for proper installation.

II. Lights are on, game is inoperative:
   1. Check to insure that the fakepinproc is commented out in config.yaml, located in the root of the game directory.
   2. Check plugs for Playboard, optional Drawer, and Cabinet.

III. Lights are out, game operates:
   1. Check the 10 Amp fuse.
   2. Check plugs and jacks.
   3. Check bulbs.

IV. No Replays are shown, coin chute rejects coins.
   1. Check coin lock-out coil, if it is not energized, check free play toggle switch setting.

2. If Coin lock-out coil is energized, check coin chute for cleanliness and general maintenance.
3. Check to ensure game is selected by pressing the R button on the footrail.

V. Coin is accepted, game is inoperative:
1. Check coin switch.
2. Check to ensure game is selected by pressing the R button on the footrail.

VI. Ball Lift fails to operate:
1. Check motor connections.
2. Check trough switch positions.
3. Ensure 8 balls are loaded in the game.

VII. Replays score incorrectly:
4. Ensure scoring features are enabled correctly per the score and instruction cards on the game selected.
5. Verify scoring numbers within closed_search_relays() method for the selected game. If a change is needed, submit your change back to the master repository (see Appendix for details).

MECHANISMS/BOARDS AND THEIR FUNCTION

1. COMPUTER: The computer within the game is an off-the-shelf Intel NUC running Linux. Game logic and operating system are stored on a solid state drive within this computer. It is important not to remove power from this computer until the system is properly shut down. Located on the left side of the back door.

2. REPLAY REGISTER: This is a dual-solenoid driven mechanism that provides audio for replays earned in every game. It is located at the top of the left side of the back door.

3. SHUTTER RELAY: Provides 50VAC to Shutter Motor. This is located at the center of the back door, along the top.

4. LIFTER START RELAY: Provides 50VAC to the Ball Lift Motor. This is located at the upper-right of the back door, along the top.

5. BELL: The bell provides an audible award for each replay in certain games made by United. It is located in the left side of the head, inside the back door.

6. SOUNDER: This provides an audible recognition of replay or feature award. It is located beside the Bell in the left side of the head, inside the back door.

7. 48VDC POWER SUPPLY: This provides power to each solenoid within the game. It is located in the middle of the left side of the head, inside the back door.

8. 5VDC POWER SUPPLY: This provides logic power, as well as General Illumination power to the game. It is located in the bottom of the left side of the head, inside the back door.

9. PLUG PANEL/TRANSFORMER PANEL/FUSE PANEL: This panel allows for playfields and cabinet to be separated from the head, and contains fuses for the main line power and 50VAC. The Transformer provides 120VAC as well as 50VAC to the game.

10. RASPBERRY PI 3 - INSTRUCTION CARD: This computer handles the display of the instruction card for the selected game. It is connected via a local network through the Network Switch on the back door. This item is located between blocks on the left side of the cabinet under the Playboard.

11. RASPBERRY PI 3 - SCORE CARD: This computer handles the display of the score card for the selected game. It is connected via a local network through the Network Switch on the back door. This item is located between blocks on the right side of the cabinet under the Playboard.

12. SPEAKERS: Located in the center of the cabinet, under the Playboard. These provide the sounds for the mechanical units, accurate to the game selected.

13. P3-ROC: This board interprets switch presses and gives directions to fire coils as the game code stored on the computer dictates. It also provides other functions, such as serial addressing, for Switch and Driver boards. It is located to the right of the Computer on the back door.

14. DRIVER BOARD #1: Provides power to 16 of the coils within the game (as shown on the Schematic). It is located below the relays, on the right side of the back door.

15. DRIVER BOARD #2: Provides power to an additional 8 coils and 4 lamps (as shown on the Schematic). It is located below Driver Board #1, on the right side of the back door.

16. SWITCH BOARD #1: Connects the first 16 switches (as shown on the Schematic). Located on the center of the back door, below Driver Board #2, and to the left of Switch Board #2.

17. SWITCH BOARD #2: Connects the second 16 switches (as shown on the Schematic). Located on the right side of the back door, below Driver Board #2, and to the right of Switch Board #1.

18. SWITCH BOARD #3: Connects the third set of 16 switches (as shown on the Schematic). Located on the center of the back door, below Switch Board #1, and to the left of Switch Board #4.

19. SWITCH BOARD #4: Connects the fourth set of 16 switches (as shown on the Schematic). Located on the right of the back door, below Switch Board #2, and to the right of Switch Board #3.

20. SWITCH BOARD #5: Connects the fifth set of 16 switches (as shown on the Schematic). Located on the right bottom of the back door, below Switch Boards #3 and 4.

21. NETWORK SWITCH: Provides network connectivity between the two Raspberry Pi 3 computers and the Intel NUC computer. Located at the bottom left of the back door.

22. MONITOR: Located in the center of the Head, inside the back door. Any 32" TV or monitor can be used, as long as it has HDMI input and supports 720p resolution.

APPENDIX A (Parts List)

- 1x Pic-A-Play lower cabinet. A Magic Screen cabinet will simplify wiring and control for game selection.
- 2x Raspberry Pi 3 Computers
- 1x Set of Computer Speakers with Subwoofer (off-the-shelf)
- 1x Network Switch (any speed, off-the-shelf)
- 1x Intel NUC with HDMI output and solid state disk drive.
- 1x Multimorphic P3-ROC Remote Operations Controller Board
- 2x Multimorphic PD-16 Power Driver 16 Boards – each driver bank protected by a 4A fuse.
- 6x Multimorphic SW-16 Switch 16 Boards
- 1x 48VDC Switching Power Supply (off-the-shelf)
- 1x 5VDC Switching Power Supply (off-the-shelf)
- 2x 50V Relays (Any Bally EM relays)
- 1x 3" Bell (50V coil)
- 1x Sounder (50V coil)
- 1x 32" Monitor (off-the-shelf)

- 1x Service Outlet (for Auxiliary power to Raspberry Pi 3s)
- 1x Transformer/Fuse/Plug panel – 10A fuse protecting input line, 10A fuse protecting 50VAC line.

  NOTE: EACH PLAYBOARD OPTIONAL – ONLY ONE PLAYBOARD REQUIRED FOR GAME OPERATION. ADDITIONAL PLAYBOARDS WILL ALLOW PLAY OF MORE GAMES.

- 1x 25 hole Playboard with Rollovers
- 1x 25 hole Playboard with Ball Return
- 1x 25 hole Playboard with Magic Pockets
- 1x 25 hole Playboard with Card layout
- 1x 25 hole Playboard with Roulette layout
- 1x 25 hole Playboard with Bump Feature
- 1x 24 hole Playboard
- 1x 20 hole Playboard with Rollovers
- 1x 20 hole Playboard with Ball Return Feature
- 1x 18 hole Playboard
- 2x 5″ HDMI monitors per Playboard

APPENDIX B (Software Requirements)

1. Linux distribution supporting Desktop Environment of your choice. Production models use Fluxbox on Ubuntu Server.

2. Python 2.7+ (usually distributed by default with your Linux distribution).

3. Pyprocgame – https://github.com/bingopodcast/pyprocgame

4. Libpinproc – https://github.com/bingopodcast/libpinproc

5. Pypinproc – https://github.com/bingopodcast/pypinproc

6. Bingo pinball software – https://github.com/bingopodcast/bingos

NOTE: If you have trouble installing libpinproc or pypinproc listed above, run the MPF installer located at https://github.com/missionpinball/mpf-debian-installer

NOTE: You will need to supply backglass artwork for each game.

JONES PLUG LAYOUT

10

	Green V
Blue NO	Free Play V
Green NO	Free Play NO
Blue V	

JONES PLUG LAYOUT DRAWER (OPTIONAL)

24

A NO	Hold All
B NO	
C NO	
D NO	
E NO	
F NO	
Gold NO	
White NO	
Double	
Regular	
Hold Odd	
Hold Even	All Drawer Switches V

CABINET

22

Red NO	Trough 3 V
Tilt NO	Coin V
Trough 8 NO	Trough 8 V
Yellow NO	Trough 4 V
Tilt V	Yellow V
	Lifter Motor
	Trough 2 NO
Trough1 NO	Right V
Coin Counter	Red V
Trough 2 V	Coin NO
	Trough 1 V

NOTE: Lifter Motor and Coin Counter are tied together

PLUGS

24

Left NO	Right NO
	Trough 5 V
Trough 5 NC	Coin Counter
Left V	
	Replay Counter
	Replay Counter
R V	Trough 4 NC
R NO	Power (BLUE)
	Power (BLACK)

JONES PLUG LAYOUT PLAYBOARD PLUGS

18

Yellow RO V	
Yellow RO NO	19 V
Red RO NO	
Red RO V	4 V
1 V	10 V
Lane V	Gate NC
8 V	Gate V
GI Lamps	
9 V	

22

GI Lamps	23 V
13 V	Rebound V
5 V	20 V
Shutter RO V	17 V
" RunOut NC	Lane NO
28 V	6 VAC
3 V	11 V
	22 V
18 V	26 V
7 V	Shutter NO
16 V	27 V

24

	Yellow RO Lamp
	24 V
	15 V
Shutter V	12 V
	Shutter Motor
Switch Common	Shutter Motor
25 V	2 V
17 V	
6V	
21V	Red RO Lamp