

MUTHA.PCB

REVISION 12

RELEASED SEPT 2004

This is the 2004 version of REPAIR CONNECTIONS REPLACEMENT MPU for the **BALLY** 6800 Pinball games. It has some new features combined with the high level of quality construction found in all previous versions.

New features include:

- 1) The "AA" batteries and holder are gone and the Standard™ Sram M48Z02 is now a regular feature.
- 2) A "free play relay" feature has been added that will keep 10 credits posted without losing any other features.
- 3) A 5-year warranty is offered on MUTHA.PCB.
(An RMA return number will be issued after contacting Repair Connection by phone or email).
- 4) Expert follow-up technical assistance is available whenever needed. This assistance will cover any part of the game. This free service is best handled by email.
- 5) Free game Rom exchange/ replacement service for any MUTHA.PCB. Also available: a Floppy containing all 50 games for anyone with an Eprom burner.

The Repair Connection still offers a repair service for any BALLY MPU. If the MPU is deemed unrepairable, we can offer a trade-in on a brand new MUTHA.PCB at the same time. Contact us for details on the repair/trade offer. Most MPU's that are heavily acid damaged or have multiple repair attempts are usually not restorable.

The built -in test procedure for the MUTHA.PCB is identical to the Bally MPU it replaces. However, there are more test points and LED indicators on the MUTHA.PCB making troubleshooting easier if needed. If the MUTHA.PCB doesn't want to start you can notify The Repair Connection by phone (508-224-1919) or by email tcallahan@adelphia.net. Before contacting us do the following checks to help us diagnose the problem:

- 1) Go to our website <http://www.repairconnection.com> and download /print out our Tech page- "Bally Power Distribution" found under 'Bally Tech Tips'. This simple flow chart will explain where the voltages (needed to run the MPU) originate and how they are regulated and routed. All that is needed to follow this trail is a simple Radio Shack Digital VOM and the chart. This information will help you determine if the Power Supply, Solenoid Driver or the MPU is the problem.

2) If you can verify the proper voltages leading up to the MUTHA.PCB then do the MPU voltage checks (lower left corner, just to the right of J4 connector).

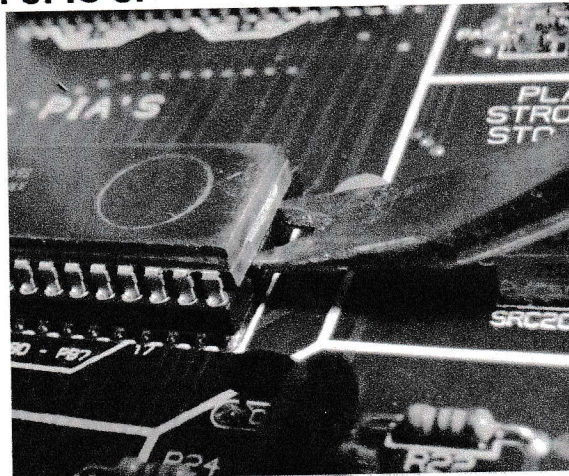
- a. Left of R113 reads 43 VDC; the right side reads 22 VDC.
- b. Left and right sides of L1 reads 12 VDC.
- c. Left and right sides of L2 reads 5 VDC.

The 2 Red LEDs should be on with the left most (5VDC) slightly dimmer than the center one (12VDC). The green LED reflects the Bally start-up diagnostics. If any of the above voltages are out of regulation or missing then the MUTHA.PCB won't start and we should be contacted for additional help. It could be nothing more than a blown fuse or overheated connector at the Power Supply.

The MUTHA.PCB has been remarkably reliable over its 7-year production run with only a few having been sent back for service. Most of the problems were found (in the game itself) without having to send in the MPU.

The additional charts provided will cover the Game Features Switch Options and the Free Play Relay Switch settings. If customer wants to disable the Free Play feature simply remove the Relay from its socket.

If customer is changing any IC for any reason please note the following photo concerning the removal of IC's:



If a screwdriver or other tool is being used for prying, make sure that the tip of the tool is inserted between the IC and the socket, not under the socket. Prying under the socket can damage both the socket and the MPU.

CONTACT INFORMATION

Tom Callahan 21 Heather Drive Plymouth MA 02360

Email: tcallahan@adelphia.net

Website: <http://www.repairconnection.com>

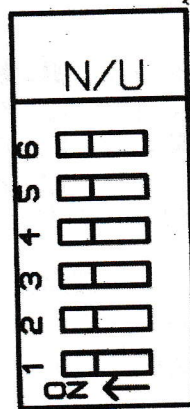
Voice: 508 224 1919 (1-5 PM EST)

Fax: 508 224 6247 (24 Hours)

OPTION SWITCHES

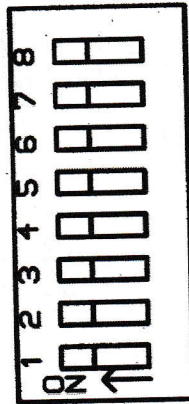
MUTHA.PCB IS SET FOR 1COIN-1PLAY.
 ADDITIONAL INFORMATION SHOWN
 IS FOR PLAY PER COIN OPTIONS
 USING COIN SWITCH #2.

COIN/PLAY OPTIONS AVAILABLE ARE:
 1 COIN/2 PLAYS THRU 1/15 PLAYS.



S32
 S31
 S30
 S29
 S28
 S27

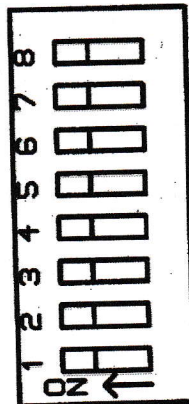
EARLY GAMES (FREEDOM-PARAGON)
 USE SWITCHES #25-#28 FOR
 COIN/PLAY MULTIPLIERS.
 CHECK GAME BOOK UNDER S25-S28
 "SETTINGS FOR COIN CHUTE #2".



S26
 S25
 S24
 S23
 S22
 S21
 S20
 S19

LATER GAMES USE #25 AND #26
 FOR MAXIMUM CREDITS.

LATER GAMES (NITRO -CYBERNAUT)
 USE THESE SWITCHES #17 - #20
 FOR COIN/PLAY MULTIPLIERS.
 CHECK GAME BOOK UNDER S17-S20
 SWITCHES FOR COIN CHUTE #2.



S18
 S17
 S16
 S15
 S14
 S8
 S7
 S6

EARLY GAMES USE #17, #18, #19
 FOR MAXIMUM CREDITS.

USING THE FREEPLAY-RELAY

TO UTILIZE THE "FREEPLAY RELAY" IT IS NECESSARY TO SET SOME OF THE DIP SWITCHES FOR THE FOLLOWING 3 FEATURES: [1] DISPLAYING THE CURRENT CREDITS, [2] NUMBER OF CREDITS GIVEN FOR 1 COIN AND [3] MAXIMUM CREDITS. THE DIP SWITCHES USED FOR THESE 3 FEATURES VARY FROM GAME TO GAME. THIS CHART CAN BE USED TO MATCH UP THE NAME OF THE GAME WITH THE SWITCH SETTINGS.

THE FIRST 8 'CHIME' GAMES WILL USE THE FOLLOWING SWITCH SETTINGS. NOTE: THE THREE GAMES LISTED BELOW WILL HAVE TO BE "PRIMED" BY HAVING THE 10 CREDITS PUT ON THRU ONE OF THE COIN SWITCHES. 'THE FREEPLAY RELAY' WILL MAINTAIN THE 10 CREDITS ONCE THEY ARE ENTERED AND DISPLAYED. REMAINING 5 GAMES (8BALL THRU STRIKES & SPARES) WILL LOAD 10 CREDITS ON START-UP.

NAME OF GAME	DISPLAY CREDITS	MAXIMUM CREDITS (10)	NOTES
FREEDOM	SW #20 & 21 ON	SW # 17 ON (18 & 19 OFF)	BOOKEEPING FUNCTION # 6 SHOWS CURRENT CREDITS
NIGHT RIDER	SW # 20 & 21 ON	SW # 17 ON (18 & 19 OFF)	BOOKEEPING FUNCTION # 5
EVEL KNEVEL	SW # 20 & 21 ON	SW # 17 ON (18 & 19 OFF)	SHOWS CURRENT CREDITS FROM THIS GAME FORWARD

FOR THESE 8 GAMES-TO SAVE EXCESS WEAR ON THE CHIME COILS AND MECHANISMS IT'S RECOMMENDED THAT SWITCH #8 (COIN-UP AND START-UP TUNES) BE IN THE OFF POSITION.

EIGHT BALL	SW # 20 & 21 ON	SW # 17 ON (18 & 19 OFF)	STARTING WITH 8BALL-
POWER PLAY	SW # 20 & 21 ON	SW # 17 ON (18 & 19 OFF)	10 CREDITS ARE
MATA HARI	SW # 20 & 21 ON	SW # 17 ON (18 & 19 OFF)	AUTOMATICALLY ENTERED
BLACK JACK	SW # 20 & 21 ON	SW # 17 ON (18 & 19 OFF)	ON START-UP AND THEN
STRIKES&SPARES	SW # 20 & 21 ON	SW # 17 ON (18 & 19 OFF)	REPLACED WHEN USED

FOLLOWING 7 GAMES HAVE SAME SWITCH SETTINGS AS ABOVE:

**LOST WORLD- 6 MILLION \$ MAN- PLAYBOY-
SUPERSONIC- STAR TREK- KISS- PARAGON**

STARTING WITH NITRO GROUNDSHAKER THRU CYBERNAUT THE REMAINING GAMES WILL USE THE FOLLOWING SWITCH SETTINGS:

NITRO GROUNDSHAKER-HARLEM GLOBETROTTERS- DOLLY PARTON- SILVERBALL MANIA- SPACE INVADERS-FUTURE SPA- ROLLING STONES-MYSTIC-HOT DOGGIN- VIKING-SKATEBALL-FRONTIER-XENON-FLASH GORDON-EIGHTBALL DELUXE-FIREBALL II -EMBRYON-FATHOM-MEDUSA-CENTAUR-ELEKTRA-VECTOR-MR & MRS PACMAN-SPECTRUM-SPEAKEASY- B.M.X.-GRAND SLAM-GOLD BALL-X'S & O'S-SPY HUNTER-KINGS OF STEEL-BLACK PYRAMID-FIREBALL CLASSIC-CYBERNAUT	DISPLAY CREDITS SW # 27 & 28 ON	MAXIMUM CREDITS (10) SW # 25 & 26 OFF	1 CREDIT FOR 1 COIN- SW # 17 On (18,19 and 20 off)
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FOR THE FREEPLAY RELAY TO WORK PROPERLY- SET ALL 3 REPLAY LEVELS STARTING WITH THE LOWEST AT '01' AND THE HIGHEST AT '03'. USE THE GAMEBOOK'S SUGGESTED REPLAY LEVELS (FOR 3 OR 5 BALL). THEN SET A SLIGHTLY HIGHER LEVEL FOR THE HIGH SCORE TO DATE '04'. THIS WILL PREVENT THE FREEPLAY RELAY FROM CONTINUOUSLY ADDING CREDITS.

U2 & U6 GAME ROM LIST		
GAME	U2 POSITION	U6 POSITION
FREEDOM	FREE2732.U2	FREE2732.U6
NIGHT RIDER	NGHT2732.U2	720-2132.U6
EVEL KNEIVEL	EVEL2732.U2	720-2132.U6
EIGHTBALL	8BAL2732.U2	720-2132.U6
POWER PLAY	POWR2732.U2	720-2132.U6
MATA HARI	MATA2732.U2	720-2132.U6
BLACK JACK	BLKJ2732.U2	720-2132.U6
STRIKES & SPARES	ST&S2732.U2	720-2132.U6
LOST WORLD	LOST2732.U2	720-2832.U6
6 MILLION \$ MAN	6MI\$2732.U2	7203032.U6
PLAYBOY	PLAY2732.U2	720-3032.U6
VOLTAN	VOLT2732.U2	720-3032.U6
SUPERSONIC	SURP2732.U2	720-3032.U6
STAR TREK	STAR2732.U2	720-3032.U6
KISS	KISS2732.U2	720-3032.U6
PARAGON	PARA2732.U2	720-3032.U6
HARLEM GLOBETROTTERS	HARL2732.U2	720-3532.U6
DOLLY PARTON	DOLL2732.U2	720-3532.U6
FUTURE SPA	FSPA2732.U2	720-3532.U6
NITRO GROUND SKAKER	NITR2732.U2	720-3532.U6
SILVERBALL MANIA	SILV2732.U2	720-3532.U6
SPACE INVADERS	INVA2732.U2	720-3532.U6
ROLLING STONES	ROLL2732.U2	720-3532.U6
MYSTIC	MYST2732.U2	720-3532.U6
HOT DOGGIN	HOTD2732.U2	720-3532.U6
VIKING	VIKG2732.U2	720-3532.U6
SKATEBALL	SKAT2732.U2	720-4032.U6
FRONTIER	FRNT2732.U2	720-4032.U6
XENON	XNON2732.U2	720-4032.U6
FLASH GORDON	FLSH2732.U2	720-5232.U6
8 BALL DELUXE	8DEL2732.U2	720-5232.U6
FIREBALL II	FB2-2732.U2	720-5232.U6
EMRYRON	EMBY2732.U2	720-5232.U6
FATHOM	FATH2732.U2	720-5332.U6
MEDUSA	MDUS2732.U2	720-5332.U6
CENTAUR	CENT2732.U2	720-5332.U6
ELEKTRA	ELEK2732.U2	720-5332.U6
VECTOR	VECT2732.U2	720-5332.U6
MR & MRS PAC MAN	MR&S2732.U2	720-5332.U6
SPECTRUM	SPEC2732.U2	720-5332.U6
SPEAKEASY	EASY2732.U2	720-5332.U6
BMX	BMX-2732.U2	720-5332.U6
GRAND SLAM	GRNDSLAM.U2	GRNDSLAM.U6
GOLD BALL	GOLD2732.U2	720-5332.U6
X's & O's	X&OS2732.U2	720-5332.U6
SPY HUNTER	SPY-2732.U2	720-5332.U6
KINGS OF STEEL	KNGS2732.U2	720-5332.U6
BLACK PYRAMID	BLKP2732.U2	720-5332.U6
FIREBALL CLASSIC	FB-CLASS.U2	720-5332.U6
CYBERNAUT	CYBE2732.U2	720-5332.U6

1 of THESE
FOR
(3 Games)

SPECIAL
U2 & U6

1 of THESE
FOR
(4 Games)

1 of THESE
(1 Game)
ON MPU
w/ Dolly
U2

- * EIGHTBALL
- * POWER PLAY
- * MATA HARI
- * BLACK JACK
- * STRIKES & SPARES
- * LOST WORLD
- * 6 MILLION \$ MAN
- * PLAYBOY
- * VOLTAN
- * SUPERSONIC
- * STAR TREK
- * KISS
- * PARAGON
- * HARLEM GLOBETROTTERS