

NB II

Replacement CPU and SOUND Circuit

**For all Bally pinball machines
6 and 7 digits series**

Manual available in:

FRENCH / ENGLISH / GERMAN

NB II 1.2

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These explications apply equally to almost all pinball machines, (6 or 7 digits).If there are differences, they are explained in the manual (with diagrams if needed).



**The pictogram signifies very important information.
Read carefully.**

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Circuit boards are for sale on www.stepflip.fr

<< Bally >> and the names of all the games of the 6 digits and 7 digits are the property of Bally.All other names of companies or products are registered trade marks or are commercialized by their respective companies.

Acknowledgements: DocPinball, Christine and Stéphane Lepaire, Francois Davroux, FredC,Stéphane Pinck, Pascal Janin.

Firstly, I would like to thank you for your support and the purchase of this new and magnificent circuit board.

This project started during a conversation between Nicolas and myself at the Vierzon trade-fair in 2010. He told me of an idea he had, the subject being CPU circuit boards for Bally pinball, first and second generation. These circuits are more and more difficult to find, above all in good condition and not always easy to repair, therefore, why not make a new circuit simpler and more reliable?

Once back home he started to work on the project. He often contacted me to discuss the elaboration of this circuit. During one such discussion, we also approached one of our biggest problems: the sound!

It's true that on these two generations of Bally pinball, we often encounter big problems with the sound circuit. Why not also make an adaptable sound circuit?

Nicolas took up his file and contacted me again to propose that we make only one circuit: CPU and sound.

Stef : << *That's a great idea but do you think it's possible ?*>>

Nico : << *Its tedious work but it's feasible.* >>

A few months later, he called to tell me that he had found a solution to compile CPU and sound on the same circuit. Then he told me of an idea:

Nico : << *I think I can even add and modify the sound.* >>

Steff : << *That's great !And all that on the same circuit? But how?* >>

After studying, diagrams, prototype circuits etc...he presents me with a circuit, the circuit !As well as the CPU, it also replaces the original sound circuit and with an extraordinary breakthrough, he succeeds in adding a Juke Box mode and thus the possibility of personalizing the original sounds of the playfield..

I was dumbfounded, the idea of cutting out all the problems related to the CPU and sound circuit by only one circuit is in itself extraordinary but also I'll be able to add music (which for me is the major advantage of this circuit) and why not modify my own playfield. My Bally << *Rolling Stone* >> will finally breathe new life!

Two long years later, after innumerable working hours and various prototypes, here it is, the NBII ready to operate. This first version (NBII 1.1) allows replacement of the CPU and sound circuit on the first 55 of Bally pinball machines. (You can see the updates on www.steflip.fr). This circuit operates with an SD card which allows updates. Updates which will allow you bit by bit, to add new sound files as they are released. And in the future, there will also be all the Sterns, first and second generation. Even more, thanks to the SD card you can add 10hrs of recorded music to the Juke Box mode and change the sounds which are related to the playfield.

Many thanks to Nicolas for his work and all those who have helped and supported him.

Thanks to this new circuit, your game has new life and real added value. If you decide to sell your machine, remember, just the fact that you have installed the NBII circuit, is an excellent sales argument

Stéphane

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INSTALLATION OF THE NBII

Important preliminary installation instructions

Before installing the circuit board into your pinball machine, it is imperative to check that this will not damage your machine. Verify meticulously and remedy any eventual problems with common sense.

① the machine must be switched off before any manipulation of electronic circuits and/ or associated components. If in doubt, disconnect from the mains.

② the various connector pins of the A4 circuit (see page 8) must be clean and free of corrosion (green traces) due to humidity and /or the original circuit security battery which is old and the waste acid has leaked and corroded everything around it, such as: components, tracks and connections.

- In case of corrosion, replace all damaged pins and also those in proximity, for security reasons, otherwise this could generate many problems which the warranty does not cover.
- It is an absolute priority that the connections which are most exposed must be checked. These are A4J3 and A4J4, (see pages 8)

③ The A2 power supply and the display driver module unit parts are presumed to be in good working order. Make sure!

- The supply tensions +5V et +12V arriving from the power supply A2 must be imperatively checked.
- If there is malfunction, this could lead the other circuits to high tension which could damage the new circuit in spite of endowed protection. In case of doubt, exchange the dubious circuits for others which have been tested valid in another game.



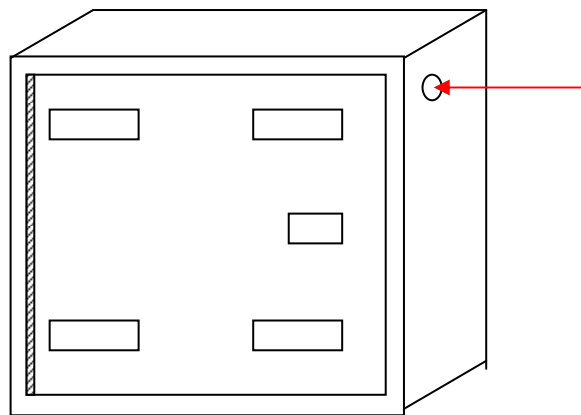
④ The circuit board must be manipulated by the edges: above all, do not touch the components, leads or connections to avoid all damage due to static electricity.

**ANY INSTALLATION TO A GAME OF UNKNOWN CONDITION
WITHOUT VERIFICATION OF WEAR IS SUSCEPTABLE TO
INVALIDATE THE WARRANTY**

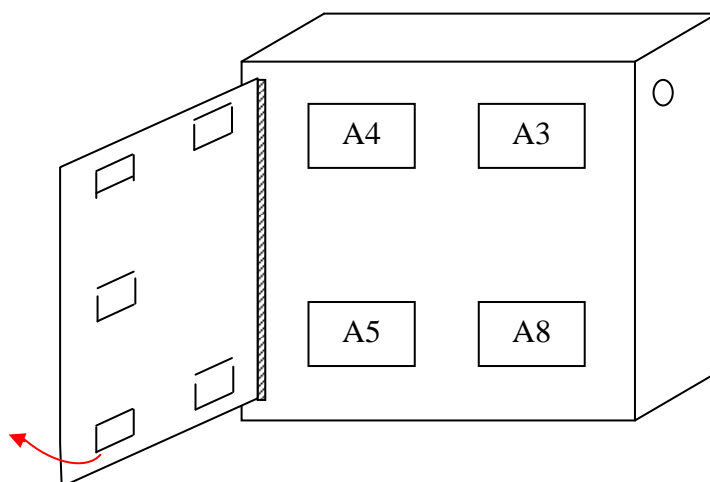
INSTALLATION OF THE NB II CIRCUIT BOARD

STAGE 1

Open the backbox of the game with the key which can be found on the right hand side of the backbox.



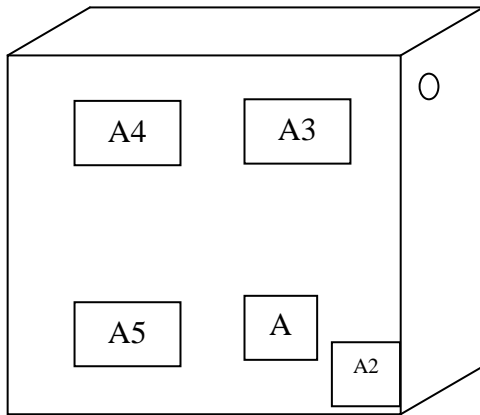
Carefully remove the backglass and then open the panel to gain access to the power supply assembly.



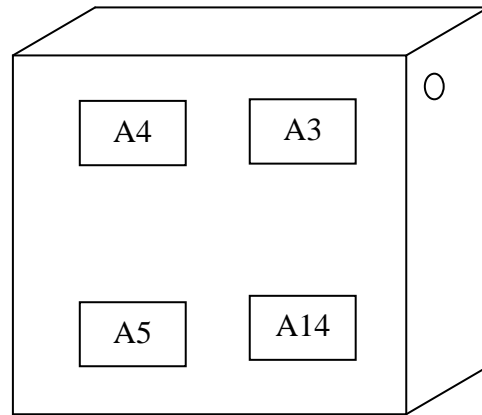
STAGE 2

Locate the circuits which are installed inside the backbox.

Caution, with the Bally 7 digits the A2 supply circuit is situated under the panel at the bottom of the backbox.



6 Digits



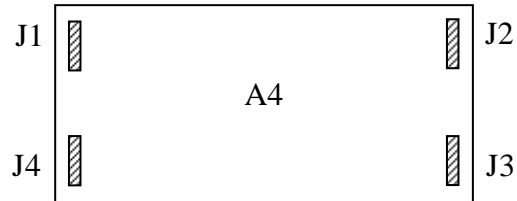
7 Digits

A2	-	Power Transformer
A3	-	Solenoid driver
A4	-	MPU module
A5	-	Lamp driver
A8 (6 digits)	-	Sound driver
A14 (7 digits)	-	Squawk and talk

The NBII circuit board will replace the A4 MPU module and also the A8 or A18 sound driver.

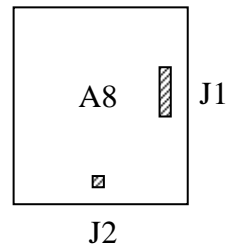
STAGE 3

Localize the A4 MPU module and the 4 connections which are connected around it's perimeter : A4J1, A4J2, A4J3, A4J4.

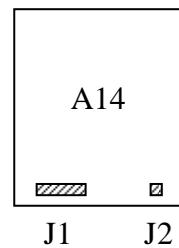


Then, the sound driver, 2 connections:

A8J2 To the (6 digits) speaker



A14J2 To the (7 digits) speaker



The connections A8J1 and A14J1 are no longer useful.

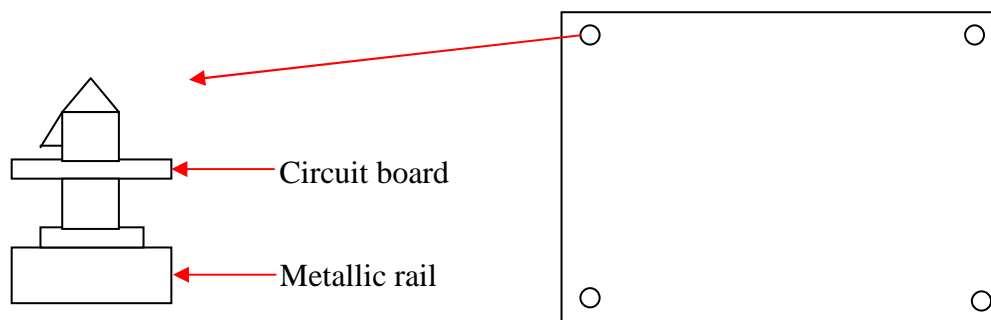
Verify the sense of insertion withdraw pulling the body of the connection and not the Lead.

STAGE 4

The A4 MPU module is clipped in place in the backbox thanks to four nylon separators with a small clip at each point.

Take out the screws and unclip the four nylon separators.

Remove the MPU module from the backbox.



STAGE 5

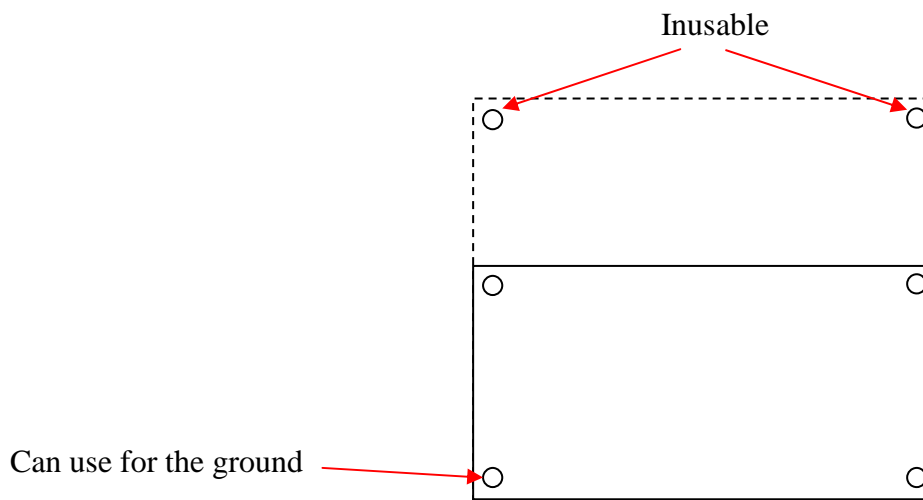
Remove the new NBII circuit board from its antistatic wrapping and proceed with the installation.

→ The wrapping must be imperatively preserved in case of return.!

The NBII should be installed in the place of three separators and a screw.

(The separator top left and the screw top right are no longer needed).

Make adjustments to the diagnostic switch << GAME SELECTION >> so that the Circuit corresponds to your game. (see list of games on page 17).



Game adjustments:

- Game adjustments are made in the same way as at the start, that is to say with the four block switches on the right hand side of the circuit board.

It is imperative that this be done with the game switched off, so the circuit board can take the adjustments into account. (ex : number of balls, credit display etc.....)

See the original manual.

- The test button at the back of the door retains its original testing functions, statistics and adjustments (test lamps, test coils, game adjustments etc.....) see original manual.

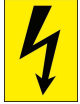
- The buttons S33 on the CPU have the same function as the original S33 (ex: clearing audits and resetting scores etc.....)

- You can also adjust your pinball machine " **freeplay** ", for it is enough to put the switch 1 of "GAME SELECT" in position ONE.

STAGE 6

Reinstall the connections A4J1, A4J2, A4J3, and A4JA to the new circuit board.
Not forgetting the connection from the A8J2 or the A14J2 speaker
from the new circuit.

Use the two point extension furnished with the new circuit if necessary.



- It is imperative before starting up the appliance, to check the other circuits and principally the supply circuit as well as the tension output.

Supply circuit 6 digits:

- A2 TP1 5.4 VDC
- A2 TP3 11.9 VDC
- A2 TP4 7.3 VDC
- A2 TP5 43 VDC

Supply circuit 7 digits:

- A2 TP1 6.5 VDC
- A2 TP3 11.9 VDC
- A2 TP4 6.5 VAC
- A2 TP5 43 VDC

POWERING UP THE PINBALL GAME

Plug in the pinball machine

- The red LED lights up to indicate that the 5V is on
If the red LED does not light up, your circuit cannot start up.

Several possible reasons:
 - * check out the tension output from the supply circuit. (see the manual p.11).
 - * check out the CPU and supply circuit connections.
- The green LED flashes 7 times before starting up.
The flashes indicate that the game program has been initiated correctly.
- In case of the LED not flashing and the circuit not starting, check that the game selection self test switch was correctly adjusted.

Your game is ready!

THE SD CARD

The SD card, which is provided with the circuit board, is a micro SD card, 4 GO, which is inserted into an SD adapter. It is a classic memory card of the type which most computers possess.

To remove the SD card from its compartment, pinch the card by the edges and draw downwards.

Insert the SD card into the hard drive of your computer.

Notice : In case of wrong handling, don't panic, all files are available on the Internet site : www.steflip.fr which will able you to recover the original configuration.

The SD card groups the whole of the programs and files which are necessary for the running of the NBII circuit.

It is unadvisable to carry out operations on files and documents which are outside of the framework of this information.

The SD card is composed of :

- a folder to each game. This contains a firmware file.
“firmware_ name_ of _ game_ .bin” and the files are
“number _ name_ of_ game. wav ” for the pinball machines
which already have a sound circuit.

- a folder for the updates “255-Update” which contain a firmware and a file
“ config _ number _ of _ version.bin”.

- a folder “Jukebox” containing the configuration file for the jukebox ,
“jukebox. conf” and sound files.

Personalizing the sound circuit :

Only one type of sound file is tolerated by the NBII circuit, this is the WAV 16 bit PCM MONO programmed at 44 100Hz. (MP3, WMA, OGG, ...) are not sustained.

Modifying the original sound

To replace the original sound, open the corresponding file in the name of the wanted game, find the sound which you want to change, delete and copy the chosen sound into the file.

Rename the new sound with the name of the deleted sound file.

Example : Replacing the music “02-Kiss.wav” from the pinball Kiss by the music “guitar. wav”.

- Open the file “015-kiss”

- Delete the file “02-kiss.wav”

- Copy the new sound card “guitar. wav ” into the same file

- Rename “guitar. wav” to “02-kiss.wav”

- Disconnect the SD card from your computer and insert it into the NBII card slot.

The Jukebox mode:

The NBII jukebox mode is exclusive in the pinball world, it enables your machine to diffuse music between or during a game.

The jukebox deactivates automatically.

The jukebox's configuration can be done by editing the file "jukebox.conf" which should be found in the documents "Jukebox" on the SD card. The layout has been developed by a parameters/values system.

Beneath is a list of parameters which can be personalized, their values and their signification.

Parameter	Value	Function
Jukebox	ON	Jukebox Power on
	OFF	Jukebox Power off
Random	ON	Jukebox plays play- list random
	OFF	Jukebox plays play list in order
Play during Game	ON	Jukebox continues to play music while game on
	OFF	Jukebox stops playing music while game on
Lower volume during game	ON	Jukebox volume diminishes while game on
	OFF	Jukebox volume remains the same while game on
Start time	SECONDS	Delay before Jukebox power on
Pause time	SECONDS	Delay between each melody

Whilst editing the titles from the files, it is imperative that small and capital letters be respected.

Example: activate the jukebox and add the sound files "I love pinball, wav" to the play list.

- Open the jukebox folder,
- Copy the file "jukebox.conf" with the help of any text editor,
- Replace the line "jukebox OFF" by "jukebox ON"
- After the line "play list", add a line with "I love pinball. wav" in inverted commas.
- Save and close the jukebox file.
- Disconnect the SD card from your computer and insert it into the NBII slot.

NBII Circuit Up-dates:

The circuit possesses its own update system of the latest software version of which you can benefit in just a few clicks.

To create an update, you must dispose of the file “config_numero_de_version.bin”, and, one or several files “firmware_nom_du_jeu.bin”, and then follow according to the instructions:

- Open the document “255-Update”
- Delete the file “config_ancienne_version.bin”
- Copy into the document, the file “config_nouvelle_version_.bin”
- Disconnect the SD card from your computer and insert the NBII card.
- Place the switches “GAME SELECT” into the update position.

Update

ON	ON	ON	ON	ON	ON	ON	ON
----	----	----	----	----	----	----	----

- Note, during the next step, do not switch off the machine before the 4th flash.
- Switch on the machine and count the number of LED green flashes

-flash 1 : the update program starts.

-flash 2 : the file “config.bin_nouvelle_version_” has been located.

-flash 3 : the necessary update will begin.



-flash 4 : update in operation, the LED remains illuminated for approximately 10 seconds, do not switch off the machine whilst the LED is illuminated.

-once the green LED goes out after the 4th flash, switch off the machine

-Congratulations, the update is completed; choose the switches “GAME SELECT” according to your game.

-restart the machine to benefit from the latest improvements.

Game select

BALLY	switch	1	2	3	4	5	6	7	8
1	Baby Pacman	OFF	OFF	ON	ON	OFF	OFF	ON	ON
2	Black Jack	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
3	Black Pyramid	OFF	OFF	ON	OFF	ON	ON	ON	OFF
4	BMX	OFF	OFF	ON	OFF	ON	ON	OFF	ON
5	Centaur	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
5bis	Centaur II	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
6	Cybernaut	OFF	OFF	ON	ON	OFF	ON	OFF	ON
7	Dolly Parton	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF
8	Eight Ball	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
9	Eight Ball Deluxe	OFF	OFF	OFF	ON	ON	ON	ON	ON
9bis	Eight Ball Deluxe Limited Edition	OFF	OFF	OFF	ON	ON	ON	ON	ON
10	Elektra	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
11	Embryon	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
12	Evel Knievel	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
13	Fathom	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
14	Fireball II	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
15	Fireball Classic	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
16	Flash Gordon	OFF	OFF	OFF	ON	ON	ON	ON	OFF
17	Freedom	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
18	Frontier	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
19	Future Spa	OFF	OFF	OFF	ON	OFF	OFF	ON	ON
20	Gold Ball	OFF	OFF	ON	ON	OFF	OFF	OFF	ON
21	Grand Slam	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
22	Harlem Globetrotters On Tour	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
23	Hot Doggin	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
24	Kings Of Steel	OFF	OFF	ON	OFF	ON	OFF	ON	ON
25	KISS	OFF	OFF	OFF	OFF	ON	ON	ON	ON
26	Lost World	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
27	Mata Hari	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
28	Medusa	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
29	Mr And Ms Pacman	OFF	OFF	ON	OFF	OFF	ON	ON	ON
30	Mystic	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
31	Night Rider	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
32	Nitro Ground Shaker	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
33	Paragon	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
34	Playboy	OFF	OFF	OFF	OFF	ON	OFF	ON	ON
35	Power Play	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
36	Rapid Fire	OFF	OFF	ON	ON	OFF	OFF	ON	OFF
37	Rolling Stones	OFF	OFF	OFF	ON	OFF	ON	ON	ON
38	Silverball Mania	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
39	Skateball	OFF	OFF	OFF	ON	ON	OFF	ON	ON
40	Space Invaders	OFF	OFF	OFF	ON	OFF	ON	ON	OFF
41	Speakeasy (2 Players)	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
42	Speakeasy (4 Players)	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
43	Spectrum	OFF	OFF	ON	OFF	OFF	ON	ON	OFF
44	Spy Hunter	OFF	OFF	ON	OFF	ON	ON	ON	ON
45	Star Trek	OFF	OFF	OFF	OFF	ON	ON	ON	OFF
46	Strikes And Spares	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
47	Supersonic	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
48	The Six Million Dollars Man	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
49	Vector	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
50	Viking	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
51	Voltan	OFF	OFF	OFF	OFF	ON	ON	OFF	ON
52	Xenon	OFF	OFF	ON	ON	ON	ON	OFF	ON
53	Xs And Os	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF

WARRANTY

The NBII circuit is guaranteed six months (parts and workmanship) counting from the date of purchase, against all risk of component deficiency and/or manufacture ; this guarantee protects you from malfunction after short term normal wear.

During this time, return the card to the address printed below **still in its original protective antistatic packaging** accompanied by :

- A copy of proof of purchase
- A letter explaining details of the observed faults, and in which circumstances they occurred.
- For all returns **outside the European Union** : A **duplicate pro-forma** invoice is imperative, acquired beforehand and attached to the package in a sleeve for the customs administration.

The card will be repaired or replaced and returned in the short est delay.

This warranty does not cover **under any circumstances** :

- Consequential damage directly or indirectly caused by breakdown or malfunction.
- By negligent installation, failure to comply to important instructions mentioned at the beginning of the manual, especially if the pinball contained other circuits either out of order or badly maintained, all of which could have caused damage.
- All types of transformation, << home reparations >> or by a third party, misuse or a manipulation error.
- All damage which occurred during transport (always take the option for recorded delivery!)

The warranty does not apply in case of a third party taking ownership of the card during the period of the warranty: in the event, only the first direct buyer will benefit and will remain my privileged interlocutor.

The card must be repaired exclusively by qualified professional technicians. I strongly discourage all attempts at <<individual>> reparations. All malfunction or consequences of such reparations are at the risk and peril of the utilise, and are of his own and entire responsibility.

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