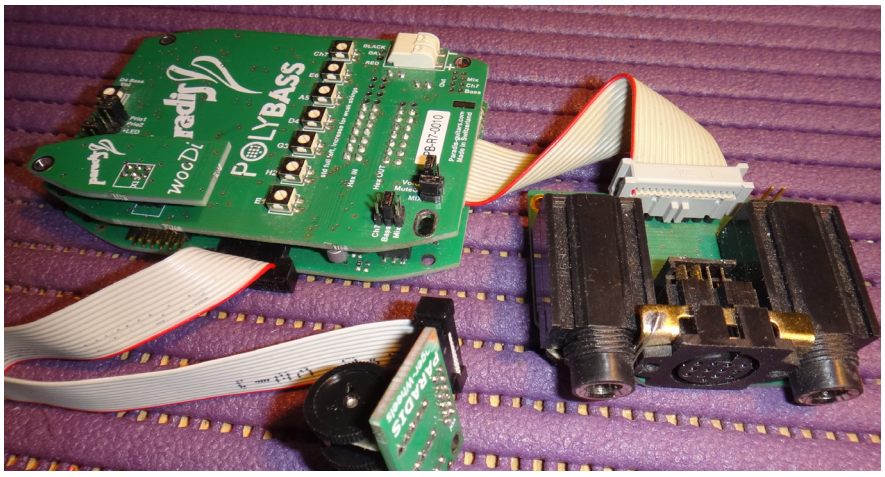
paradijs

POLYBASS



Polybass Family Overview and Background

V 1.1 April 2023

Why do we make such an effort?

Bass is fundamental

working as a sound engineer, playing in bands, studying the history of instrument making and analog electronics, the feeling became stronger every year that bass is much more important than it seems. it's unfair that the bass player is in the background, but it also fits to his fundamental task of stability and coordination for all other musicians.

Harmonies are built from harmonics of the fundamental tone. on primitive instruments like the fanfare its only possible to play those notes, and hearing the bass tone, we feel why all other notes belong together and why the notes that are not directly in the scale create an interesting tension...

more so, I feel that the vibrations resonate in our bodies and a concert or dance night is not just a social and cultural event but also a therapy... short:

IF I COME FROM A SHOW AND DID NOT FEEL SOME LOW BASS, I AM NOT SATISIFIED !!

How to create the bass in a small ensemble

unfortunately not in every combo there is space for a bass player. there are probably more duos and trios of voice, guitar and percussion or harmonica and clarinet and so on where one of those instruments takes the musical task of the bass player, yet on an instrument which does not have the size to create a real low bass.

BUT:

we are lucky that engineers of the last decades created portable woofers that fill a big room with solid and profound bass! so one of the band could play a bass pedal but we have a better solution: we divide the lowest notes of the guitar so that they turn into bass notes! the guitar plays as usual, maybe a bit more aware of its function, and the bass comes out for free, low and alive, discrete and present, but not calling attention or pretending to be another instrument: everyone can see who plays those notes, no one cares why they sound so low, but they feel satisfied

The physics of intervals

since the scales are made of harmonics which are multiples of the bass note, the higher climb in the scale, the more notes we get, the closer the intervals are. and also: the higher the frequency, the shorter the wave, the quicker we identify notes. so an interval that sounds good on the guitar can sound wobbly one octave lower!

Contents

What is different about Polybass

there have been many approaches to create bass, but not for a clean single bass line! basically, one octave generator which switches to the lowest played string would be enough. but we found that sudden switching between strings call attention. so we made an octave generator for each string, tune it to the string and then select the lowest note and fade the previous. then a steep filter takes its color, so instead of sounding like an instrument which is not on stage, it just vibrates totally synchronous to the guitar string.

The complete high class preamp system

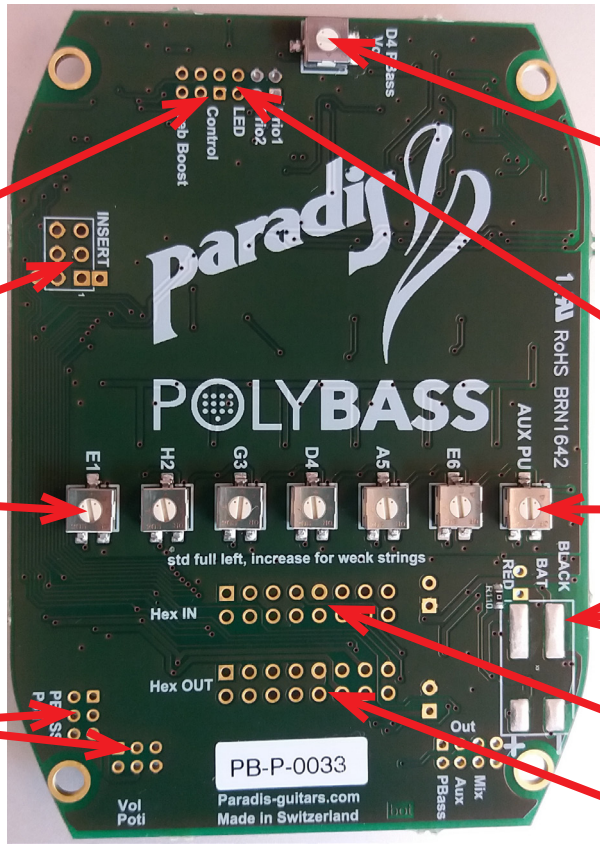
Polybass is not only the low bass but a complete 7-channel low noise low power preamp and mixing system, designed to give you the maximum possible options for configuring and mixing any kind of pickups in any guitar. the 7th channel can amplify a magnetic pick-up, a body piezo or even a microphone and on the Shield there is another preamp with notch filter in case you need 7 strings or some more pick up option.

Support for configuration and wiring

we understand the difficulties of musicians and lutiers to deal with electronics, schematics and solder iron. Paradis Guitars went through phases of using too much electronics and learned to reduce to standard parts, long life, low power, low noise...
the right amount of electronics simplifies the configuration outside the instrument and makes it sound the same wherever its connected: clean, noise free and large!

wiring can be soldered or crimped or flat cable. the headers are not soldered yet so they can be added on either side and angled or not. we ask the questions you need to find the right system and then provide all necessary parts and information (which may not yet be complete here)

in the 90ies we explained to the world what livelooping was good for, now you can participate in this evolution...



set VCA volume of PBass effect

insert connector for external mono effect like wooDi-m

select the volume of each string by adding gain to the weaker ones (default is all closed)

mixing connectors for jumpers and potentiometers

adjust the effect volume for D-string

here you can connect a LED that blinks when the battery is weak

gain of the 7th string or 2nd pickup (magnetic, body piezo, mic...)

solder battery wires

all inputs and the mix outputs are on this connector called X1

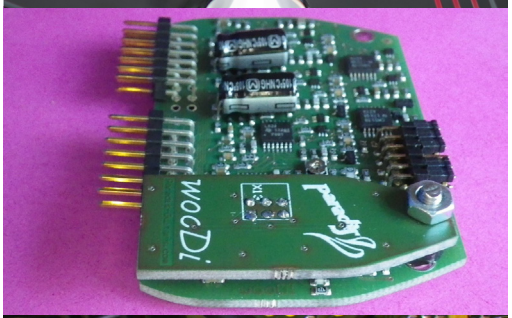
X2 to 13pin out

Basic Versions of Paradis Polybass

Polybass adds a low octave to each string separately, thats why it works so accurately. Paradis built the first Polysubbass in 1984 and started rework in 2017 to give all options to all kinds of players, luthiers and tinkerers. in 2022 it has become complete:

Polybass-R for RMC/Godin Multiac

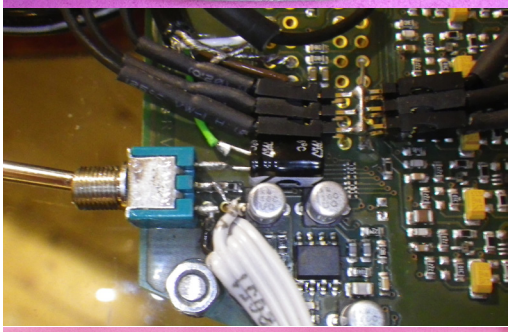
Godin/RMC produced many instruments with the necessary hexaphonic pick-up, thats why we first made the board fit perfectly into guitars with the RMC Polydrive system older than 2017.



Polybass-M the effect module

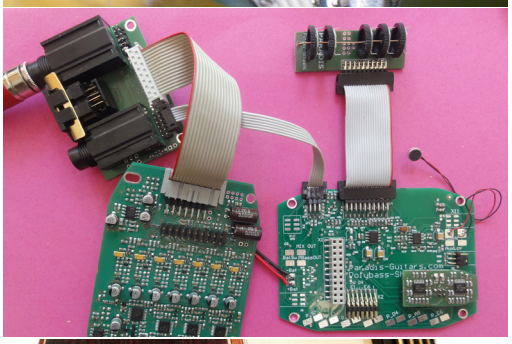
the cheapest and smallest option can be inserted into the flat cable of the RMC preamps, also the newer single board. it contains the Polybass effect, VCA and mixer, no piezo preamp.

some may be able to build it into existing hex guitars or boxes... tell me what you are heading for!



Polybass-P hand wired

the most simple way to use Polybass is by connecting the hex pickup at the input and the 1/4 jack at the output and a battery. this can all be done on one header connector. since this option did not further develop, I removed chapter from this manual. get instructions from the old manual is still available.



Polybass-P + Shield

if you want to preserve you guitar, reuse existing controls or find a space in an electric guitar, the Shield is our most flexible option. you find several output boards, wooDI-M, many battery holders and all kinds of potentiometers in our shop and we help to put together the kit for your guitar!

Polybass-Zarge

if you want a simple solid solution in a acoustic guitar or already have a hole in the side, this is the best option. you only need to solder the pickups and battery and connect one of the output boards.

you can also add a wooDI and configure a second output.

Polybass-Box

If your guitar already has a DIN 13pin output, the most easy is to connect our Box. it also feeds the guitar. it contains the wooDI and a button to switch it off - finally ;-)

you also get a 13pin-Thru which even allows to feed the Box from a Roland Synth or other 13pin unit you connect to the Thru.

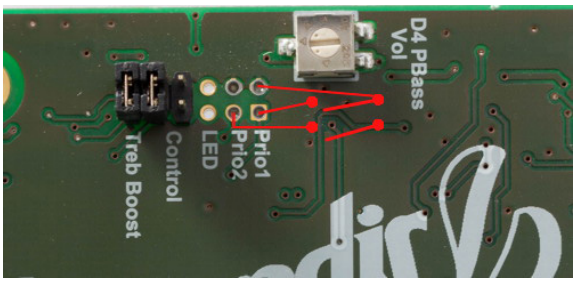
Features and Adjustments

Priority

probably the most unique part of the Polybass is the priority function:
only the lowest played string is audible and switches the higher ones off. its useful enough that we make it active all the time but you can switch it off with jumpers or add a switch.

the priority idea comes from the physical fact that we easily hear small intervals in the higher octaves but perceive the same interval as rumbling or wobbly when its in the lowest octave. that's why a bass player usually only plays one note at the time. so if you play a 4th on the lowest strings of the guitar, it sounds fine, but if we then add the lower octaves for both notes, its too much. thats why we need the priority function to only add the lower of the two notes as the bass line.
as far as we know, no other equipment on the market does this. thank you for respecting our patent of 1992!

in the classic Polysubbass unit, there was a switch to turn priority off. few people have used this, so we put jumpers now. remove Prio1 (A-string) and Prio2 (D-String) to test the Polybass effect on all strings simultaneously. if you like the option, you can install a DPDT switch to those pins.



Battery low warning

the first sign of the battery becoming exhausted (~5V) is when strong attacks mainly on the D string cause a delay of the subbass sound. when dropping further, the delay also happens on lower strings and softer attacks. we think this is a rather helpful indication since the musician will notice before the public.
for those who want a visual warning before this, you can connect a LED that flashes when the battery drops to about 7V. (see chapter LED installation)

Power consumption

the Polybass consumes 4mA and wooDI-M or Shield another 3mA. so a 9V battery with 700mAh theoretically serves for 100h.

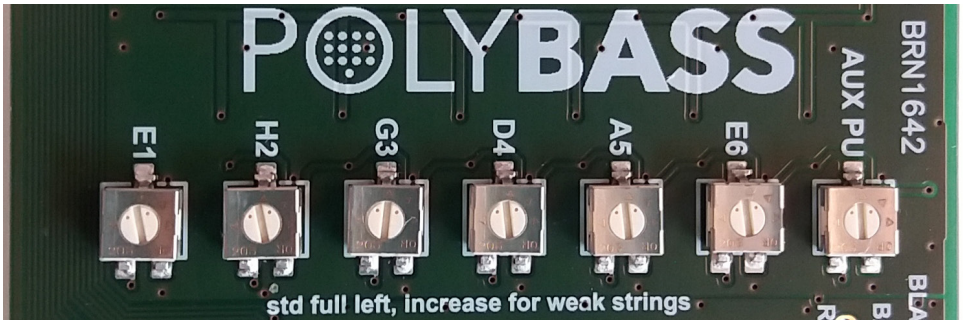
Li battery

We recommend rechargeable batteries to protect the environment. in case of professional musicians more so, because many trash the battery before its empty, just to make sure that it does not interrupt the performance. so charge before an event! the NiXx batteries have less capacity and loose their charge by themselves and then the acid comes out and eats the contacts and more. Li (and eneloop) batteries maintain charge much better and the Li have higher capacity. since a Li cell is about 3,6V, two cells produce 7,2V which is still enough for the Polybass. we are also trying to convince the industry to produce 9V batteries with 3 Li cells. the resulting 11V would make most pedals work better...

Do not buy the Li batteries with USB input because they have only one cell and transform the 3,6V internally to perfect 9V but the transformation creates a noise which is about impossible to filter!

Adjustable volume for each string

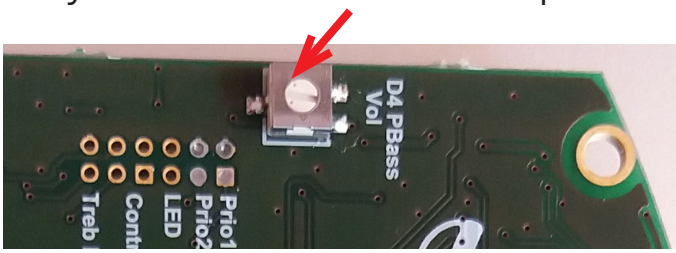
Paradis and RMC pickups are carefully balanced when new, but humidity+salt (sweat!) can make them loose bass over time. other pickups need correction when new. you may like to adapt the string volumes to your playing style, to string characteristics, to musical intentions... from outside with a little screwdriver, boosting the weak strings...



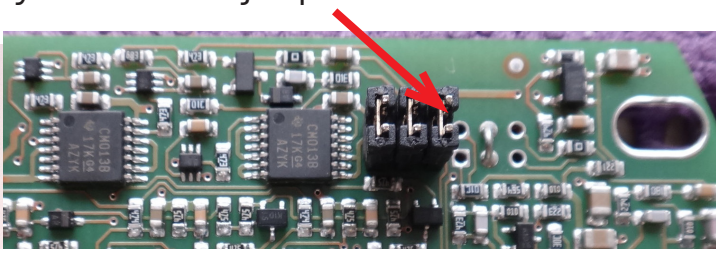
D4 string Bass volume

by default, the Polybass effect on the D4 string is similar to the E6 and A5 string. but some like to have no effect on the D4 string and some prefer it lower to get a transition between the strings with PBass and the ones without. You can control it:

Polybass-R/P has a trimmer on top



Polybass-M has a jumper which can be a resistor



Roland GuitarSynth and compatible

the Polybass is capable to drive polyphonic (hexaphonic) effects and sythesizers compatible with the Roland GK 13pin DIN system. you can install the GK Synth volume and the Up/Dn buttons however you want them.

we choose the same levels as the RMC Polydrive puts out, so Roland's "Piezo-R" setting should work fine.

When Paradis started to make Polyguitars (guitars that pick up and transmit each string separately) a new connector was needed. Neutrik was close to us and just made its huge success with the XLR connectors and their latest product was the Neutricon 8pin. very solid and far less expensive than the existing industrial connectors. we presented the connector to Roland in Frankfurt because at the time they still used the huge and expensive 24pin connector, but they told us they already had chosen a new connector and the next year they came up with the DIN 13pin which has become a standard up to date. we agreed that 8pin is not quite enough, but we were not happy with the 13pin and continued with the Neutricon until 2005 because:

- Roland choose to use the ring as ground connection instead of a pin, which is not secure: as soon as the ring starts oxidating you get heavy cracks in the sound. we choose to use gold plated connectors to improve this problem.
- the 13pin is cheap but not really solid: it is composed to two half rings which bend easily. we choose a version which-es ring is a single piece
- to bring power from the amp to the guitar is a fundamental progress of the 1/4" jack (which was made for telephone centrals...) but Roland choose to use a bipolar +-7V supply which spends a pin without necessity and makes it hard to supply the same guitar electronic with a single 9V battery. Philipp Scheidegger made a huge effort and managed to hide this problem so the Polybass works equally with battery or 13pin sup-

ply.

- the 13pin DIN has a little hook meant to be a lock. it creates problems and can dangerous: if someone stumbles over the cable, the guitar needs the connector to fall out! at least this was right on the 1/4" and the connection force of the two connectors is pretty similar, so we found a version of the 13pin without the hook.

BUT: the 13pin connector of our cables is about 2mm fater than the standard and thus does not insert into the VG99, GK-2 and GK-3 sockets - unless you cut a little rubber with a knife - ugly but easy...

CV control off the Polybass effect

VCA means Voltage Controlled Amplifier and is a common circuit for controlling a volume by a DC voltage, usually 0...5V as known in the Synth world as CV (control voltage)

Roland uses such a CV for the GK volume control.

so to make the Polybass compatible with the RMC system and the Synth world, we included such a VCA which can be controlled by such a CV to adjust the PBass effect volume!

Critical view of Pickup principles

Piezo pickups bring an aspect of acoustic guitar to the electric guitar. why?

- because the magnetic pickup creates a filter by its position. while this sounds nice and its fun to get different filtering by different pickup positions, we perceive it as "electric". the single string piezo pickups sit directly under the string and sense the vibration of the string exactly like the guitar top of an acoustic guitar does.
- for a piezo crystal its easy to pick up high frequencies, for a passive magnetic its not. broad band magnetics are made, for example the Cycfi Nu, but they need built in preamplification or they do not fit ordinary guitar amps - which the piezos do not fit either: since magnetic are basically a coil and the piezo a capacitor, they are inverse in that magnetics become weak towards treble and piezos towards the bass. connected to a low impedance input like a mixing desk, the magnetic becomes dull and the piezo thin. thats why we preamplify both in the instrument at high impedance and mix them beautifully.

Piezo pickups had a bad start because in the 70ies they were glued to the acoustic guitar tops, also at a certain spot, which produces a filter just like the magnetics do on the string!

then they were buried under the bridge which still brings feedback and coloring problems. 1984, Paradis was founded because we wanted to process the strings separately and optimized the piezo pickup for the task - which means to pick up the string as directly as possible and not pick the body since all other strings vibrate in the body equally - and we heard our new clean sound. and since the body was not pickup up any more, feedback was drastically reduced, too, it only happens when the body activates the string. from then on, we did not want to sound like an acoustic guitar any more, but better!

now, is the piezo better than the magnetics? we listed advantages, but there is a list of disadvantages, too:

- its almost impossible to destroy a magnetic pickup while its in the guitar. but the piezo is exposed, the closer it is to the string the easier it can break by an impact on the string, for example if the guitar falls on its front. to protect it means to reduce sound quality.
- the attack of a string is cruel. imagine how much bigger the impact of your pluck is compared to the later vibration. and the piezo brings this dynamic authentically while the magnetic smothes the attack. the strong attack either distorts in the amplifier, the speaker or the ear and creates unpleasant sharpness. thats why Paradis created the wooDI in 2005, following the idea of Ljubo Majstorovic, by spreading the attack in time - similar to what happens in natural materials like the wooden top or the air...

Resonances in your instrument

every guitar has some resonances in the neck and the body that “eat” the energy of certain notes, so they fade away quicker than the others. this effect is known for hundreds of years and luthiers invented tricks to minimize the problem but the more alive the wood construction is, the stronger resonances it has. usually the worst is around G...A.

those irregularities are better audible with the Polybass, but not related to it. so sorry, we cannot fix this, but you can improve a lot by holding the neck or the top near bridge firmly when you play that note

it may be possible to reduce the resonances of your instrument by adding a cover over the sound hole or stiffen the top for example by adding a bridge between top and bottom.

7 or more strings?

we offer Polybass boards adjusted for 7 strings!

but what does this mean? 7 preamps, but still 3 octave processors. so the strings 7,6,5 get a lower octave. for many, the 4 string is not needed anyway.

Since the Roland 13pin standard does not provide a 7th string, it will simply not appear there.

BUT:

do you ever play string 7 and 6 simultaneously?

if not, it might be more interesting for you to use the standard Polybass and mix string 7 and 6 to one preamp, so you can and still have a lower octave on the 4th string and when you connect to a Roland compatible 13pin processor, it receives string 7 together with string 6. this is also how the RMC preamps work.

remember: whenever you play string 7 and 6 simultaneously, the octaver will produce an unpredictable grumbling you will not like!

if you have more strings, you may want to join more strings into one preamp or combine several Polybass boards. frankly, its not the kind of business which pays our bills, but lets talk and try to find the best solution!

For which instruments?

virtually any instrument can be improved with a Polybass!

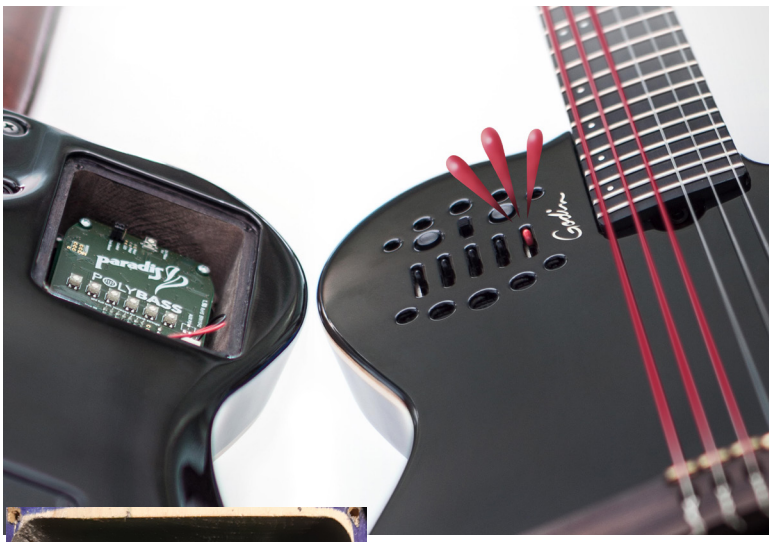
Godin Multiac and similar

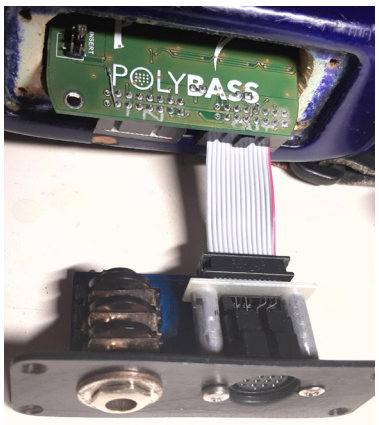
by far the most simple are the guitars which already have an older RMC Polydrive preamp with two boards: the pickups are good, the controls are available, you just replace one of the boards with the Polybass and its done. no soldering.

this also works with some other guitar brands that use this preamp and the RMC box called Polydrive

however it does not work with the newest Multiacs which have an LR-Baggs copy of the RMC system

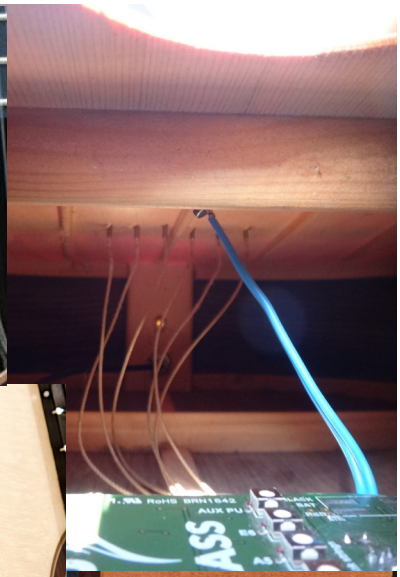
for the newer RMC boards ca 2018-21, and some copies our smaller Polybass-M module serves, since it does not replace the preamp, just adds the effect into the 14pin or 16pin flat cable, on either end of it, as the pictures explain. you can also use those for the old Multiacs, cheaper but less features.

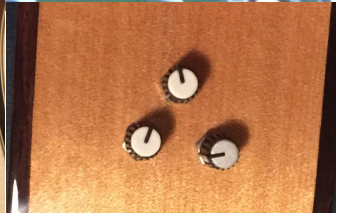




Acoustic guitars

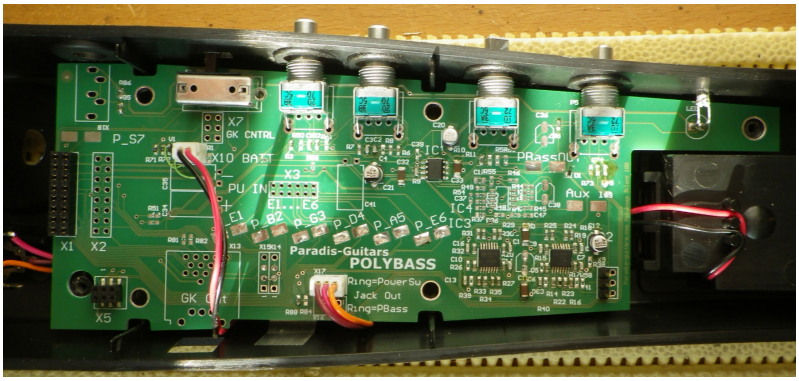
a hexaphonic pickup improves the sound because by amplifying each string, the pickups are no loads for each other. to minimize crosstalk these piezos are closer to the strings than the usual under bone - which makes the sound cleaner and reduces feedback. if you want to make the wood sound audible, you can add a body piezo or microphone. the Polybass offers a 7th input, and the Shield another preamp with optional phantom for small mics and a100Hz notch filter to remove the body resonance. you can choose polyphonic piezos from several manufacturers and place a Shield+Polybass on the side or bottom. the 2-6 controls also can be chosen and placed according to taste.





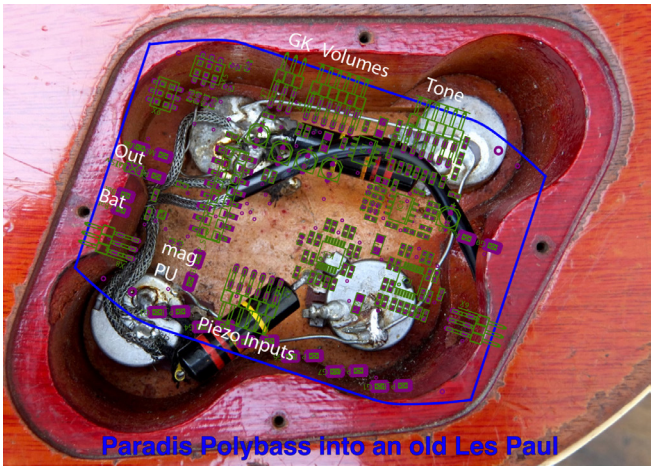
Yamaha Silent

we offer a version of the Shield which replaces the SLG100...130 board with all potentiometers and connectors so no soldering is required and nothing is visible from outside. it not only brings hex quality and PBass but increases battery live about 5 times and reduces noise drastically.



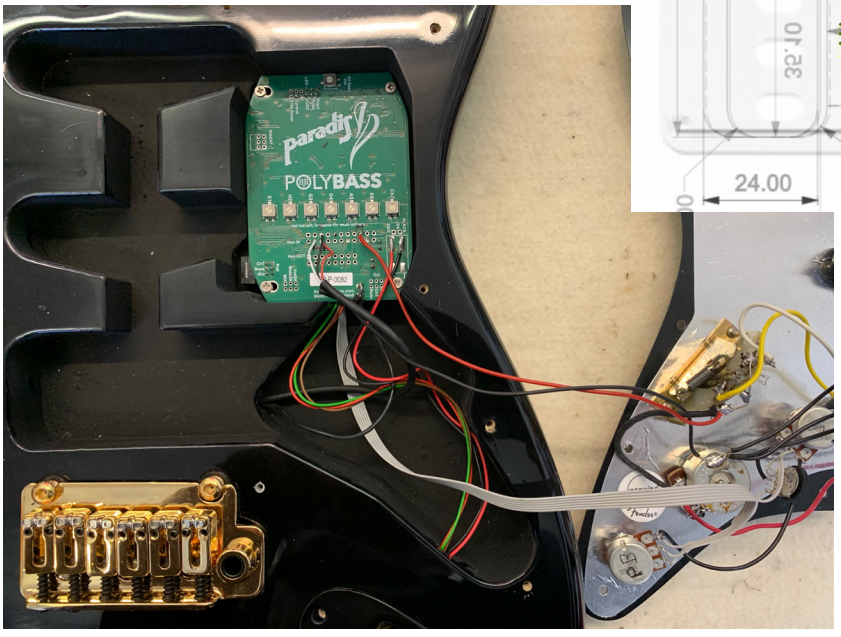
Les Paul family

Graphtech and LRBaggs supply the Tune-o-matic bridge which is trivial to replace. the wires need a little hole and can go from the bridge pickup to the potentiometer department where the Polybass fits with some carving but with the original cover, so no change is visible from outside.



Strat family

several manufacturers offer direct replacement bridges. you probably do not want the tremolo with the piezos because they pick the moving noise. so routing the space for the springs 5mm larger towards the controls makes the Polybass fit under the original back cover and opens a channel for the cables.

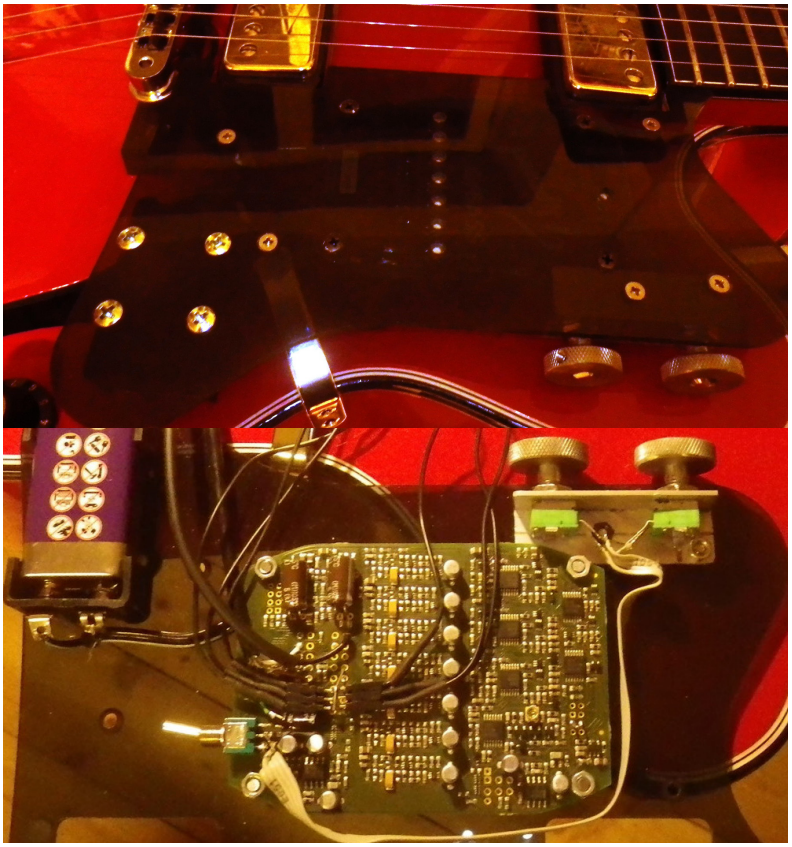


the tone pot can turn into the PBass volume so nothing is visible from outside.

Swiss luthier Marco Bernasconi made this beautiful version of a Strat with Polybass without Shield

Archtop

Graphtech and LRBaggs supply the Tune-o-matic bridge which is trivial to replace. some archtop guitars have a cover on the back or you can create one if you do not mind, so its rather easy to build the board into the hollow body, possibly screwing it to the back cover - which can be the Paradis plexi we made for the RMC version, we sell it separately.

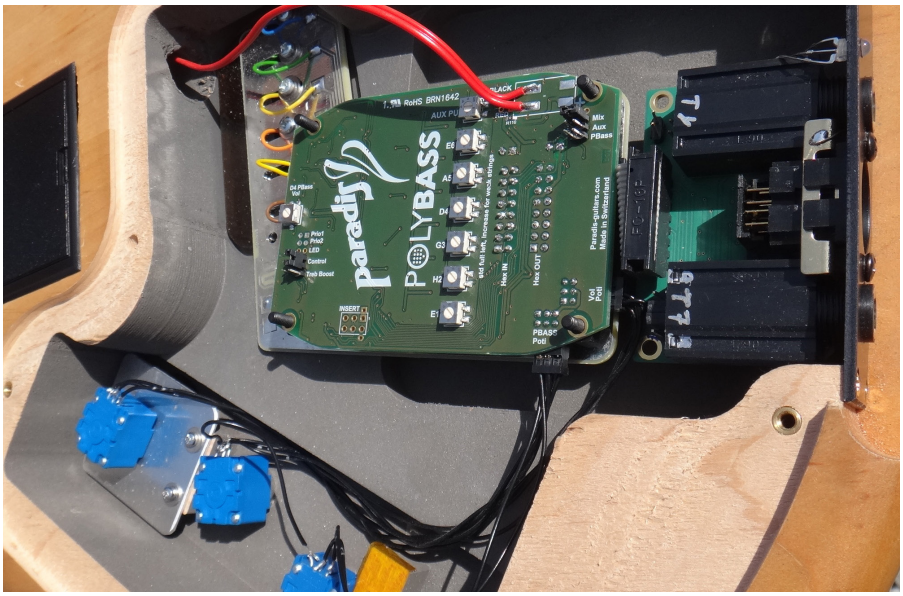


if you do not want to drill into the instrument, you can create a big enough pick-guard and screw or glue the Shield to it.

Paradis Eden

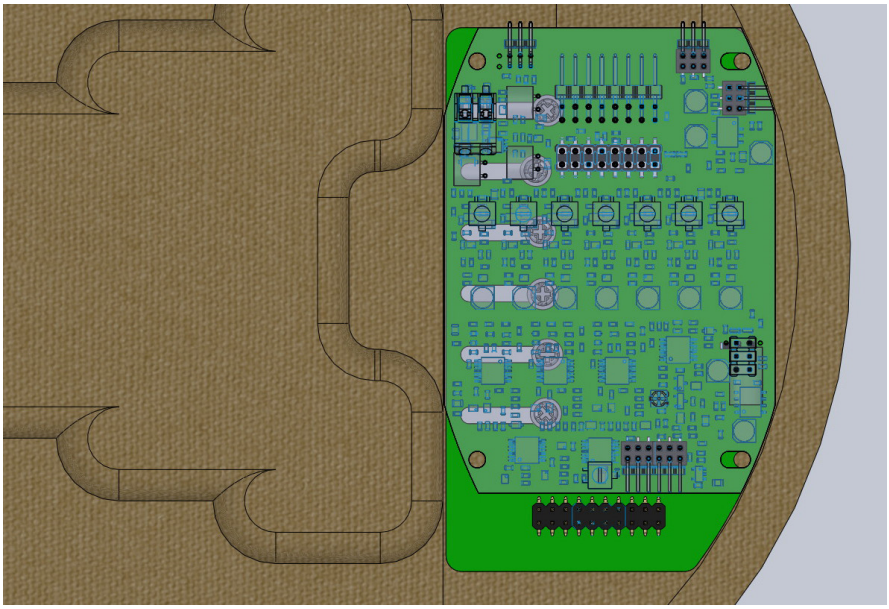
this guitar has been built for FireWire, so the space is too big for the Polybass. but it serves as an example of a Shield built especially for the Paradis Pickup and the existing space. we can do the same for your guitar model.

consider that this is nice in a rather solid body guitar but on a thin top you probably would not want the weight and resonances of the electronics, rather cable it to the bottom



Paradis Avalon

this is not quite working yet, but you see where the Polybass got her neat roundings from



What can we continue to use?

its nice to continue with whatever is installed on a guitar already. or at least the holes, so we do not need to drill new ones. its sometimes an extra effort to find out how to include or modify best, but we are experienced and willing to help:

- if you have a pickup installed, is it hexaphonic? if so we probably can use it
- if you have a 9V battery installed, we use it. is the wire long enough? we can extend or replace them, possibly with the clip
- do you want to reuse the controls? is there one you do not need so it can serve for the PBass volume? are they correct value (10k...50k)?
- if you replace the controls, can we at least reuse the holes and the buttons? depends on the kind of axis
- do you want to mix a body pickup or microphone to the hexaphonic main pickup? we can connect to the Aux preamp and just need another volume or balance control
- do you want to continue with the preamp module (bass-treble ou EQ or tuner...) installed? lets see how we can connect the Polybass board to its input

Suitable Pick-ups?

Polybass needs that the strings are picked up separately - which has several other advantages.

we tested the following piezo pickups:

- Paradis golden pickup lets you adjust pitch and hight but needs a special bridge, so its the best for new instruments! like the Lirio
- L.R.Baggs I do not know their old version but the new golden version which is not on their site yet works perfectly and is available in our shop
- RMC works great
- Graphtec Ghost sounds ok but needs more sensitivity: open trimmers to half

those pickups should work but we did not test yet:

- Cycfi makes fantastic magnetic pickups that certainly work
- Roland GK brings little bass when installed very close to bridge, we work on a Polybass-Box that fits the GK system.
- Submarine has a hexaphonic pickup but not yet fully split outputs
- Shadow made hex pickups since the 80ies for the GTM...
- Ubertar makes hexaphonic magnetics in standard size...

Controls

which parameters can be controlled?

those controls you can connect directly to the Polybass or the Shield:

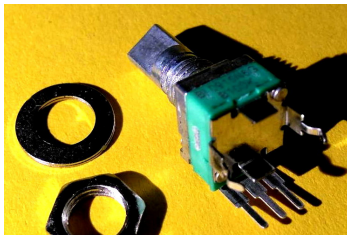
- Volume: either Master volume or Main pickup only
- Sub-Octave effect Volume, we call it PBass Vol
- Aux Volume for either:
  - the 7th preamp on Polybass or
  - the preamp with 100Hz anti feedback notch filter on the Shield or
  - a third party preamplified mic like L.R.Baggs Anthem
- GK Synth Volume and up/down as defined by Roland. consider to use some external MIDI control or a pedal instead.

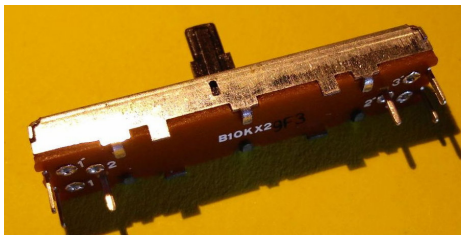
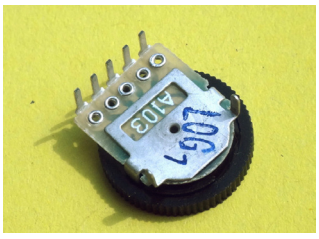
a well made piezo guitar does not need any filters to sound well on flat speakers. fine tone corrections are better made at a mixing desk or effect pedals than in the instrument. but we understand clients who want immediate access, so the Shield offers

- Bass
- Treble

What kind of controls are available?

in the shop we offer two sizes of conductive plastic potentiometers and 3 sizes of sliders and 15mm thumbwheels:



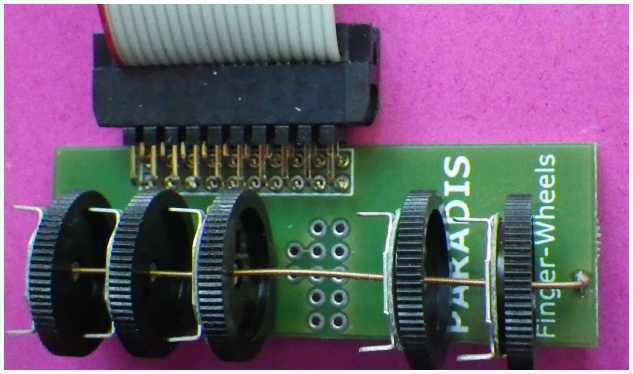



technically our potentiometers are clearly superior to small sliders and thumbwheels because they are conductive plastic and live a lot longer and feel smoother than carbon or cermet. and the shaft is solid and a whole is easy to drill.

how to mount the controls in the instrument

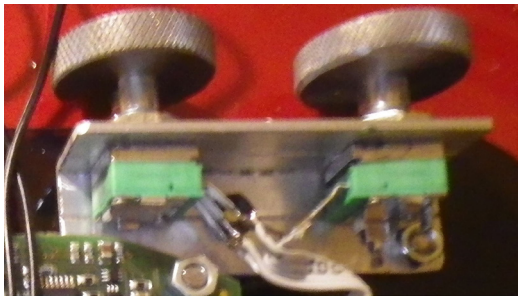
in a solid body, you want potentiometers. but standard threads are only 5 or 6mm long so you may need to look for a special guitar pot or work into the wood.

for acoustic guitars, potentiometers are less liked because they need a hole and stand out, so you may opt for a sound hole thumb-wheel solution.



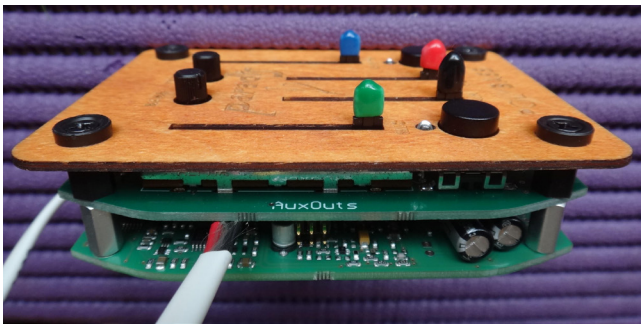
FingerWheels we call our new kind of vertical thumb-wheel arrangement. it connects with a flat cable to the Polybass Shield: 2-4 volumes and 2 tones. we can populate less thumb-wheels or create a different PCB.

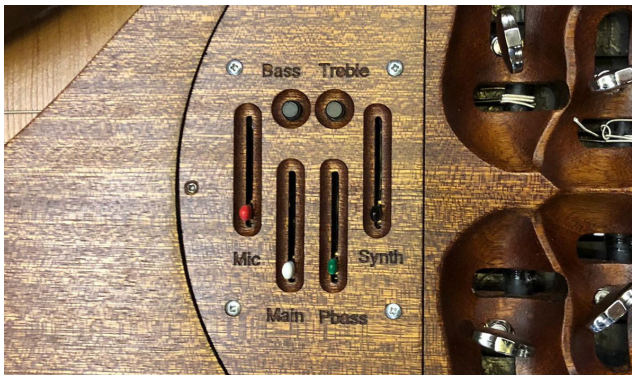
bigger thumb-wheel (also called rotary) potentiometers but usually they are not easy to find in small quantities: Piher, Shokay, Alpha



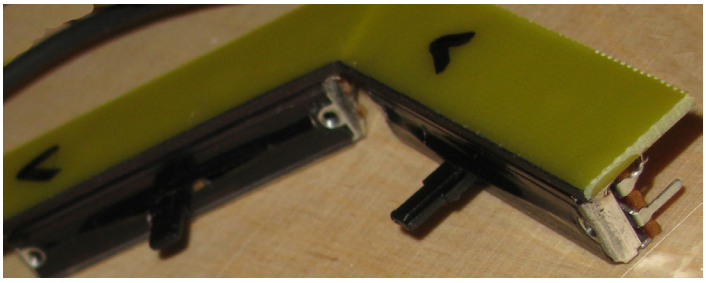
or make one from a better potentiometer as we did for the archtop guitar you see on a previous page:

if you want to use sliders, you can use our Shield-R module and either make nice slots into your guitar or use our flexible plywood or plastic front panel:





this is a Rolf Spuler construction with the sliders:



Output Connectors

What signals do you need?

- MIX - all signals mixed with the controls on the guitar
- PBass (low octave only) - very usefull to feed a bass cabinet, add less effects
- Mic/BodyPiezo only - may need additional equalization and different effects
- PBass and Mic output can depend on the control on the guitar or not
- Magnetic pickups may want to run passively to their tube amp while the other signals sound better over some flat monitor/PA system.
- Each string separately
- Control outputs to control parameters that are not availabe in the guitar
- Power from outside to save batteries and environment.

which connectors for which signals?

we spent years of our lives discussing these needs with clients and creating individual solutions or explaining our flexible ready solutions!

over 90% of the musicians want a **Main 1/4" standard guitar connector** with a mix of all signals to be able to jam with any amp or a single channel in the mixer. and for about half if them, thats all they need. its easy to install and solder or connect to the Polybass or the Shield. the best is to have this option plus split signals available:

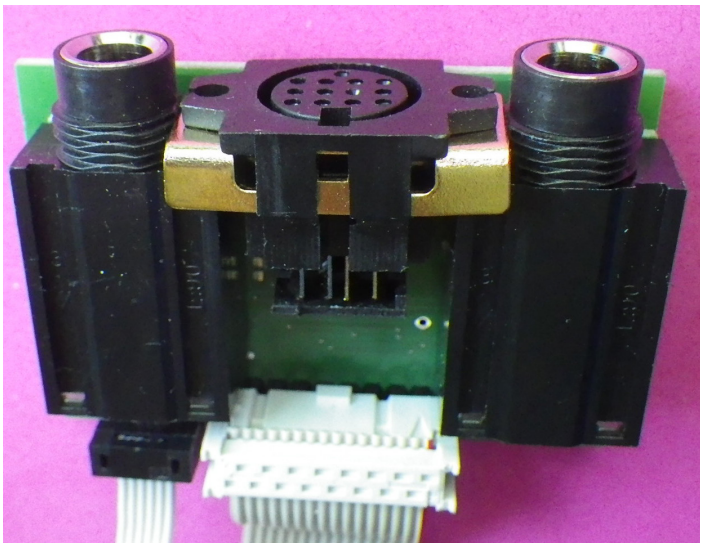
many want the **13pin DIN (Roland compatible)**, either for writing scores, or MIDI instruments or effects like polypan, polydistortion... the 13pin DIN carries:

- 6 strings separately
- 1 additional audio signal (define with a jumper: Mix, PBass or Mic/Body)
- 1 control voltage, (can control any parameter, not just Volume!)
- 2 buttons (can control any parameter, not just Up/Dn!)
- 2 power supply (yes, you can get rid of the batteries, with only a simple supply)

many like an **additional output of the split polybass signal** to be amplified on a bass amplifier, subwoofer or PA. usually a separate Aux 1/4" jack or the ring of the main 1/4" or the 13pin (see chapter Split Polybass effect out) the Aux jack can also carry the Mic/body only signal on the ring

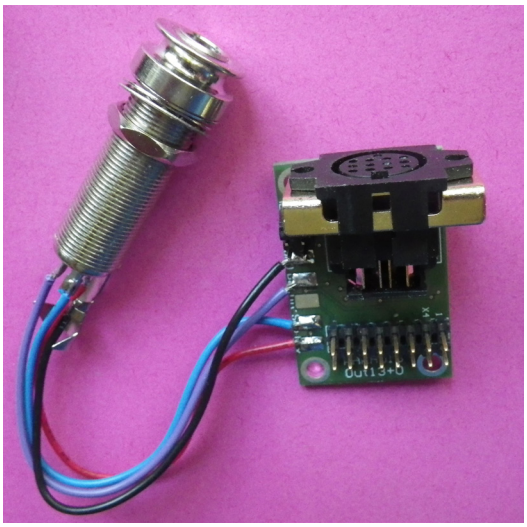
few prefer to have **no controls on the guitar** (looks great!) and mix with pedals or a mixer they always carry along the guitar. they usually output 3 or 4 signals: Bridge piezo + Pbass + Mic/body +/or magnetic (passive or preamplified): either a multi-pin like Neutricon, Lemo, Hirose... or two 1/4" stereo jacks (stereo to mono Y cables are available, its easy to tie two together)

now the most difficult is **a switching combination** like: when the second output is connected, the main output turns into Bridge Piezo only.



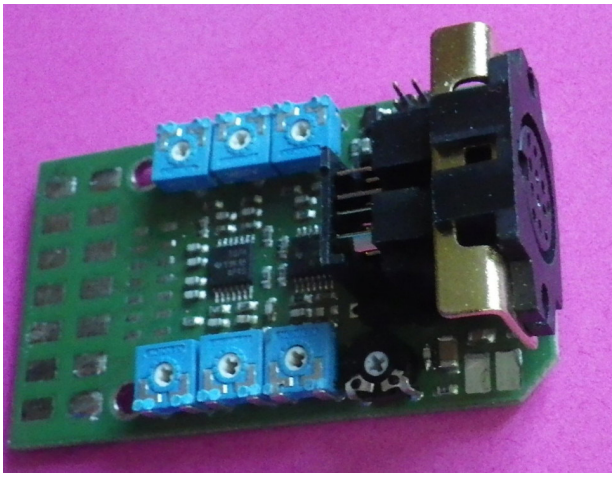
Out 13+2 PCB board

- 2 1/4" jacks with 2 on-on switches DPDT,
- 2 12pin 2mm headers to configure with jumpers
- 1 13pin DIN GK connector with gold contacts and metal fixing for two M3 screws
- 1 16pin header that matches Polybass X2 (and RMC)
- 1 6pin 2mm header to allow the Aux to switch the Main from Mix to Bridge
- optional two color LED - green is always softly lit and red blinks when Bat low



Out 13+0 PCB board

bascially the same as the Out 13+2 but with only the 13pin on board and pads to solder any kind of mono or stereo output connector, usually the strap kind used in acoustic guitars



Out13 + Preamp

this one is meant for guitars without 1/4" output and external effect boxes like the Polybass Box. its advantages are:

- only one hole (plus 2 screws) in the guitar
- no battery
- the same effect box can be used for several guitars

Mixing Options

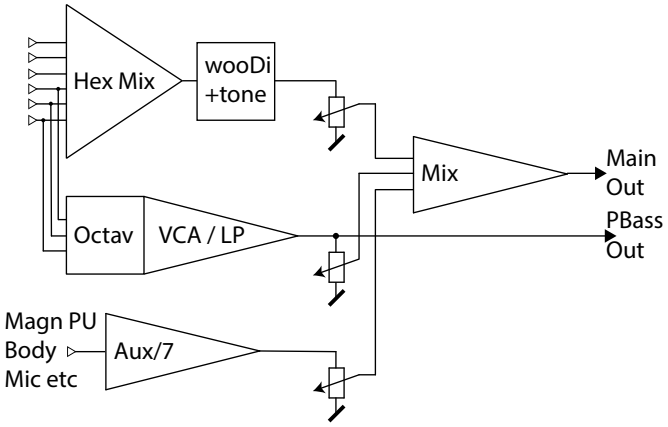
we offer several options to connect and control the elements. this may give you some work to understand and choose, but its nothing compared to the effort you already made to dominate your instrument :-).

a main question is whether you want a Master Volume or parallel mixing:

Parallel (no Master):

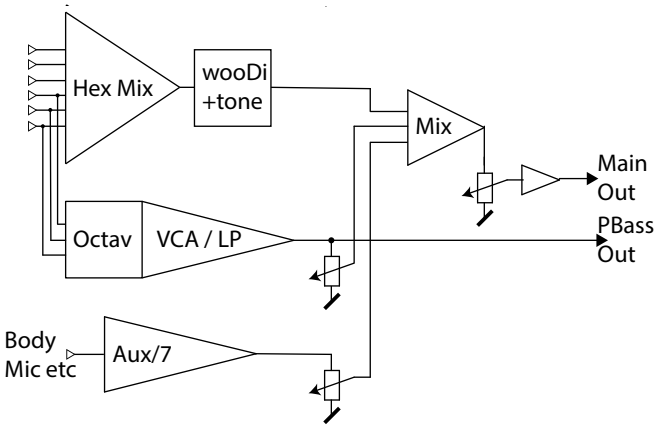
each element has its volume and they do not influence each other. advantages:

1. any combinations like only PBass (not so fantastic) or only Body-piezo
2. some ideal volume of the PBass or Body-piezo can be set (p.ex. the max before feedback or distortion) and the main pickup volume can change independently



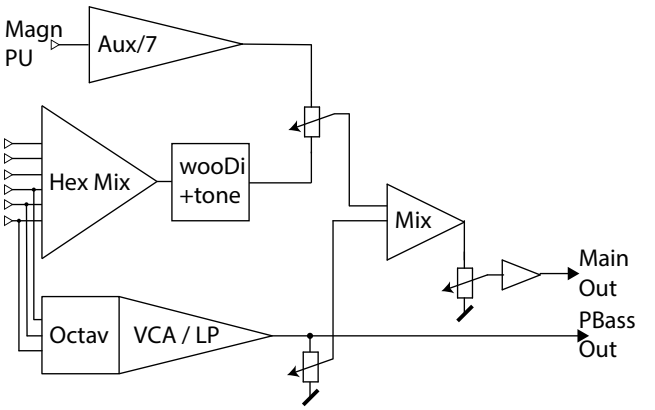
Master and Aux:

usually the Master volume comes instead of the main pickup volume. so there is no way to eliminate it, only the additional channels are mixed to it. makes most sense when there is a clear main pickup and the additional like body piezo and PBass are never used on their own



Master and Parallel:

additional to the parallel solution one control for the general volume. all is possible but there is one more control - thus a very rare option.

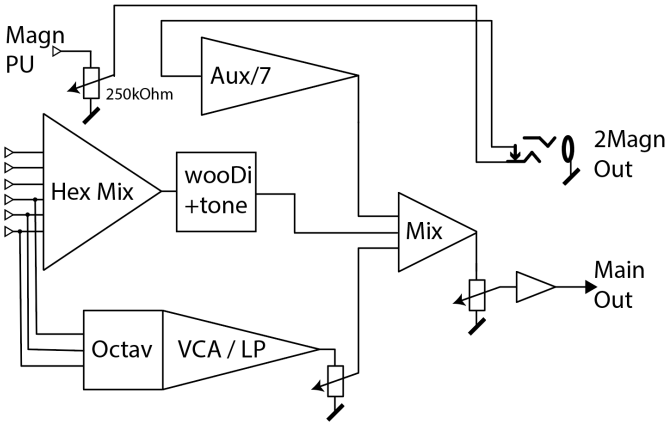


Balance:

makes sense between pickups of equal importance like magnetic and piezo. the volume then somehow turns into the master for the pickups, while the PBass or body piezo are added like in the parallel option

Passive Magnetic Pickup

for those who want to maintain the traditional magnetic pickup sound, it makes sense to have a hi-Z potentiometer and separate output for it. this can be switched so that the magnetic pickup is mixed to the main output in case the Magn Out is not connected:



Split Polybass effect out

sometimes its interesting to amplify the Polybass effect signal (we call it simply PBass in this manual) separately from the normal guitar signal because:

- some guitar effects (specially distortion) suffer when the PBass is mixed in.
- guitar amps are not necessarily able to transmit the low PBass frequency and may distort or not sound as full as the PBass can. better connect the PBass to a subwoofer (no need for frequency divider) or some full range speaker or PA.

Connector options for split outputs

1. Stereo: main jack tip = Guitar / main jack ring = PBass
2. 2 Jacks: add second jack for PBass
3. our Out13+2 board: contains the second jack (Aux) and jumpers to configure it

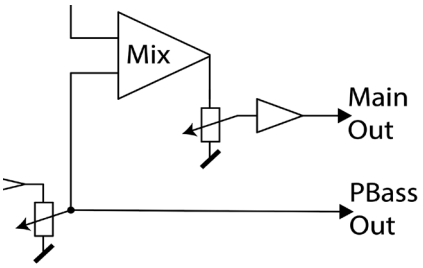
13pin DIN options (also available on our Out13+2 board):

4. 13pin only: pin7 = PBass / piezo sound mixed in synth from single strings.
5. main jack = PBass / DIN13pin7 = Guitar
6. main jack = Guitar / DIN13pin7 = PBass

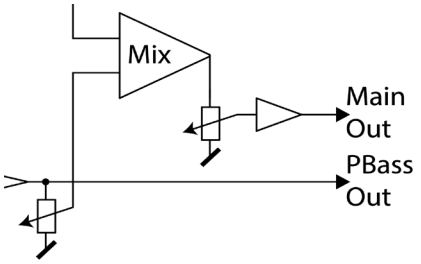
Remove the PBass from the Main?

it seems obvious to remove the PBass signal from the main output but think about those flexible options first:

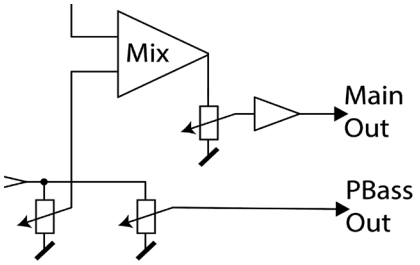
- same control for PBass to both outputs: open the PBass control on the guitar just a little so it does not create a problem on the main amp. then open the bass amp enough to get the full bass. now you can still adjust the amount of bass on the instrument, using only the lower range of the control - careful to not open it too much...



- send the PBass always at full volume to the split output: the contol on the instrument can be totally closed or add a little to the monitor, while the PBass output can be regulated at its bass amp or with a foot pedal or let the house tech do the mix.



- add another control for the split PBass. could be another volume or a switch on the instrument.



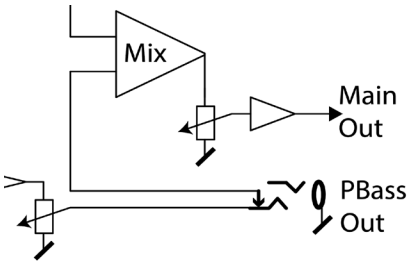
careful engineers observe that in this case and the previous, the output has a worst case impedance of 10k in case of a 20k pot - on such a strong bass signal this will be hardly noticed and can be fixed with a DI box

How to switch back to mono

you can skip this paragraph if you do not remove the PBass from the main output (previous paragraph) or if its fine to always use your stereo system with the special cable, .

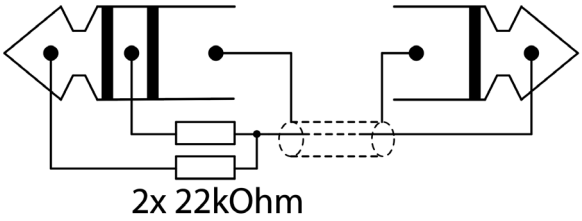
otherwise you probably like to be able to connect a mono cable as usual and still get the PBass with one of those options:

- using two separate jacks, the Split jack switch off the PBass from the main jack. we added a 6pin flat cable between the Out13+2 board and the Shield for this purpose. it brings the controlled PBass and Mic signals to the Aux jack and if its not connected, the signals go back into the Mix. there are jumpers to configure each of those signals separately.



- install a switch somewhere, maybe with difficult access, that chooses from mono or stereo out, independent on what is connected.

- mix both outputs in an external cable. this is especially easy when the second output is the ring of the main output jack so you only need to make a cable which is stereo on one side (hide 2 ca 22k 1/10W resistors in it) and mono on the other side.



- solve it with the volume control as described as last solution in the Remove the PBass...? paragraph

Adapt to you needs!

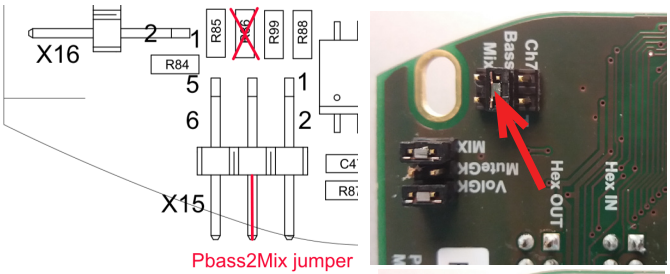
we would love to implement each artists wishes, but it takes a lot of time and the distance makes it harder, so we will have to deliver standard versions or charge for modifications - or you do modifications yourself with our instructions!

Implementation of the Split PBass out

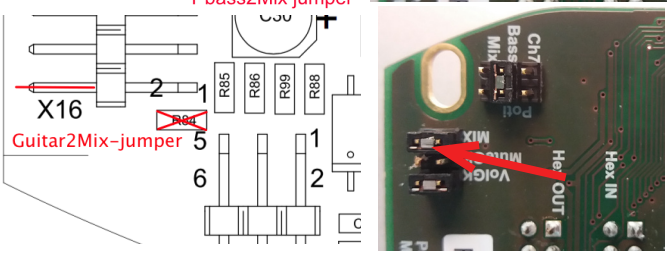
if you do not use our Out13+2 board, here the instructions to do it your way:
the PBass signal is available on X2: pin16 or X15: pin4
X2 pin7=Mix, pin9=Gnd
if you want to also mix the Pbass to the Main out, better use X15 so you can return on pin3. otherwise, X2 is easier: all on one connector.
if you use the Shield, we can pre-configure it according to your needs.

a problem with option 4: DIN13 mono = PBass only / guitar mixed in synth from single strings is that for example the GP-10 does not let you simply mix the six string signals without any effect. it always wants to model something.

to cut the Polybass signal from the mix (only guitar on Main out), remove the jumper on X15pin3-4(center) (on boards with Serial < PB-R-0068 its the 0-Ohm resistor R86)



for option 5: to cut the guitar signal from the mix remove the jumper on X16pin1-2 (on boards < PB-R-0068 remove the 0-Ohm resistor R84 or move the jumper on X12 from Mix to Pbass)



VCA

probably you do not need the VCA for your application so set it to full volume with a jumper between X14 pin1/3
if you want to use a 0-5V DC voltage to control the PBass volume, connect it to X1 pin8 and set the jumper on X14 between pin3/4

three volume steps for PBass

some users do not want a slider for PBass volume control but 3 settings:
Off - Discrete - Full
this can be achieved with a little switch that connects X14 pin3 to pin1 - none - pin4

Roland GK control

you can also use the internal buffer to create a GK volume control for the synth you connect to the 13pin output.
again connect the slider of the control potentiometer to X1 pin8
a jumper X14 pin1/3 to not control the PBass with it
a jumper X16 pin5/6 to connect the CV to the 13pin out (except for < PB-P-0045)

Credits

I came up with all this, but I would not reach anywhere without good friends!

Philipp Scheidegger is the very experienced electronic engineer who simulated the details, reduced power consumption, draw the schema, made the layout, and finally thought me how to use the layout software so I am free to complete and modify what he did!

Tom Maier of 24dB.de had the great idea to replace a RMC pcb's to make this plug and play.

Rein, Taivo and Vahur of spicetone.com organized the manufacturing and testing of the boards

Heinz "Rüebli" Fässler of Rueblirock.ch is the great inventor and mechanics who finds the right solutions and materials, prints and lasers...

Vasilis Kotareles of media5.ch created the site and explained me how to complete it, tested, took pictures and always brings some good mood and great music!

Randolph Arriola of embryosongs.com helped in great discussions to understand the business situation, my texts, this manual... and always feeds with his love for what we do...

Adrian Schackmann similarely tested, thought, recorded, explained, encouraged...

Markus Baltensperger was my best client and started to get involved with his ideas, contacts, testing, distributing...

Ursetta Mutzner of muurmeli.ch was always patient to listen to my stories and keeps our place cozy and tasty, created the Messe booth, went to the post office in-numerous times and reminded of what I forget...

Rolf Spuler could not participate in this version physically any more, but his incredible spirit is always present and brings quality and precision...