THE TRIKO
ANALOG TRI-CHORUS
Programs & Midi Control

Kit The Triko

EN Version 1.1 Janvier 2016

Before starting

PLEASE READ CAREFULLY ALL INSTRUCTIONS BEFORE USING THIS APPLIANCE. KEEP THIS INSTRUCTION SHEET FOR FURTHER REFERENCE. THE SAFETY INSTRUCTIONS MENTIONED IN THIS USER'S GUIDE CAN'T COVER ALL POSSIBLE CONDITIONS AND SITUATIONS. USERS SHOULD BE VERY CAREFUL WHEN USING THIS APPLIANCE.

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

ATTENTION: RISQUE DE CHOC ELECTRIQUE - NE PAS OUVRIR

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

The symbols above warn the users of potential danger in case of misuse of electrical appliances. The thunderbolt in a triangle symbol shows that there is danger of electrocution. The exclamation mark symbol shows that there are usage and safety measures which must be observed.
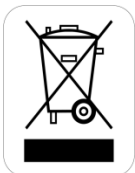
When disposing of the appliance, contact a collection and recycling centre for electronic appliances.

INSTALLATION

THIS APPLIANCE MUST BE EARTHED.

Do not remove the protection offered by the polarised or earthed connectors.

A polarised plug has a pin larger than the other. An earthed plug has a receptacle for an equipotential connection. If the connector provided does not match your wall plug, have one installed by a qualified electrician.

Use only the power cord provided which should not be used with any other device.

Take good care of the power cord. Do not let it become twisted, do not walk on it and do not put other things on it. A damaged cord could cause electrocution or a fire!

Before using the appliance overseas, check with your reseller, an approved repair centre or the manufacturer for compatibility with the local standards.

Do not use or store the appliance in very hot (in direct sunlight, near heating devices) or humid conditions (bathrooms, floodable cellars etc.). Do not expose the appliance to rain, dust or strong vibrations.

Take care to always put the appliance on a flat and stable surface. Do not ever install it in unstable positions. Do not ever install the appliance on feet, supports or racks other than those indicated by the manufacturer. If using in a rack, avoid rocking it while moving it. Do not obstruct the ventilation holes.

Do not let any foreign objects (flammables, paper clips, pins etc.) or liquids (water, soda, alcohol, cleaning products) get inside the appliance.

If there is a risk of thunderstorms or if not using the product for a longer period of time, unplug the appliance from the wall.

This appliance, used alone, with an amplifier or with earphones, can produce sound levels which could provoke terminal loss of hearing. Never use it at high levels for long periods of time or in any circumstance where the listening could become uncomfortable. In case of loss of hearing, consult a specialist immediately.

Only use the accessories advised by the manufacturer.

IMPORTANT

Unplug immediately the appliance and contact your reseller, an authorised repair centre or the manufacturer in the following situations

- The power cable or its plug have been damaged.
- Smoke or unusual odours come out of the appliance.
- Foreign objects or liquids have accidentally come in contact with the appliance.
- The appliance has been exposed to rain or excessive humidity.
- The appliance seems to not function properly or its performance is diminished.

You have chosen to assemble yourself your equipment. Therefore you take complete responsibility for the material damages or physical injuries this equipment could cause.

BALORAN.SAS cannot be held responsible of the performance of the product and does not offer any legal warranty..

Before starting

Before starting make sure that you possess the required qualifications and experience as well as the necessary material to assemble successfully The Triko:

- Variable temperature soldering station or soldering iron 15W-30W
- Soldering paste or wire suitable for your equipment. The components and the electronic circuit are compatible with lead-free soldering.
- Unsoldering pump or unsoldering braid
- Pliers, screwdrivers of diverse sizes
- Crimpers for insulated cable terminals
- Precision digital multimeter
- Analogue or digital oscilloscope

The resistors' values are inscribed on their ties. Some capacitors are grouped by their value marked on their paper envelopes to avoid confusion. But we advise you to verify the capacity of all resistors as well as the inscriptions on the condensers and all other components. The PCBS have two sides with a metallic hole, unsoldering is not an easy job!

There is a high resolution photo for each circuit (both sides for the panel circuit) which will allow you to verify the type of components, value of trimmers etc...

Some terms that you will encounter in this document

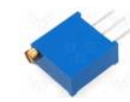| MLCC (multilayer ceramic capacitor) | Plastic capacitor | Non-polarised capacitor | Electrolytic capacitor | Multiturn adjustable capacitor | Lit push button |

Order of assembly

We suggest the following order:

Main card

- Insert and solder the horizontal resistors
- Insert and solder the integrated circuits sockets
- Insert and solder the MLCCs
- Insert and solder the "plastic" capacitors
- Insert and solder the electrolytic capacitors
- Insert and solder the multiturn adjustable capacitors
- Insert and solder the two vertical resistors
- Insert and solder the sockets and connectors

Control panel card

- Insert and solder the resistors
- Insert and solder the memory socket
- Insert and solder the MLCCs
- Insert and solder the encoders and lit push button
- Insert and solder the screen
- Insert the LEDs WITHOUT SOLDERING

Assembling the case

- Burring lightly the inside of the front
- Fasten the command card on the front side
- Solder the LEDs after setting their depth
- Build the connection cables
- Crimp the power connection cables
- Mount the bottom of the case
- Fasten the IEC power socket and the sector switch
- Fixati Fasten the front panel
- Fasten the back panel on the connectors of the main card and then fixing it to the case
- Connect the connection cables
- Power up, verify the voltage on all the IC sockets and on the display
- Insert all IC in their sockets and test the switch on

Update and setup

- Update
- Setup instructions

Main card

Inserting and soldering the horizontal resistors

The values of the resistors in the kit are written on their ties. All the resistors' values are also written on the PCB. There are some differences which are detailed in this document:
http://www.baloran.com/Triko/Kit/Main_diff.pdf

Inserting and soldering the sockets of the integrated circuits

Careful with the orientation of the supports ;) The notch on the socket must match the printed notch.

Inserting and soldering the MLCC (ceramic capacitors)

The MLCCs' capacities are written on the PCB. Four capacitors are not inserted. See on the top right corner of this document: http://www.baloran.com/Triko/Kit/Main_diff.pdf and place 3 bridges as per:
http://www.baloran.com/Triko/Kit/main_zone_alim.jpg

Inserting and soldering the "plastic" capacitors

The capacities are written on the PCB. There are a few differences explained in this document:
http://www.baloran.com/Triko/Kit/Main_diff.pdf

Inserting and soldering the electrolytic capacitors

The capacities are written on the PCB. There are a few differences explained in this document:
http://www.baloran.com/Triko/Kit/Main_diff.pdf

The NP capacitors are not so clearly identified, « - » written on the cylinder.

Inserting and soldering the multiturn adjustable capacitors

The capacities are written on the PCB and on the components. Please check on
http://www.baloran.com/Triko/Kit/Main_top.jpg

Inserting and soldering the two vertical resistors

Next to the Midi Out socket there are two resistors (220R, R206, R207) which must be soldered vertically.

Inserting and soldering the base sockets and the connectors

Before soldering the base sockets, you must widen the XLRs' drilling holes. Hold the sockets in a vice between two small pieces of wood for protection and using a 3mm drill bit enlarge the screw hole.

There are two TRS out jacks with 3 contacts. The jacks for the 8 inputs have two contacts. The XLR sockets must be perpendicular on the PCB. For all the connectors and their positioning check first on http://www.baloran.com/Triko/Kit/Main_top.jpg and http://www.baloran.com/Triko/Kit/Assemblage.jpg

Put a 10mm brace (H on http://www.baloran.com/Triko/Kit/Assemblage.jpg) on the inscription side and a washer and a black nut on the solder side. The brace helps to fix a daughter card like the FV-1.

Control panel card

http://www.baloran.com/Triko/Kit/Panel_TOP.jpg

http://www.baloran.com/Triko/Kit/Panel_BOTTOM.jpg

Inserting and soldering the resistors

The resistors' values are written on their ties. All the values are also written on the PCB. These components must be soldered on the side opposite to the inscription. (See comment above).
There are a few differences explained in detail in this document:
http://www.baloran.com/Triko/Kit/Panel_diff.pdf

Inserting and soldering the memory support

Careful with the positioning! :) The notch on the support must match exactly the one on the inscription.
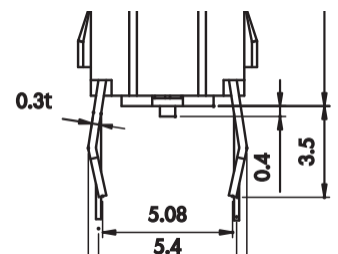
Inserting and soldering the MLCCs

All the capacities are written on the PCB. These components must be soldered on the side opposite to the inscription (see note above).

Inserting and soldering the encoders and the lit push buttons
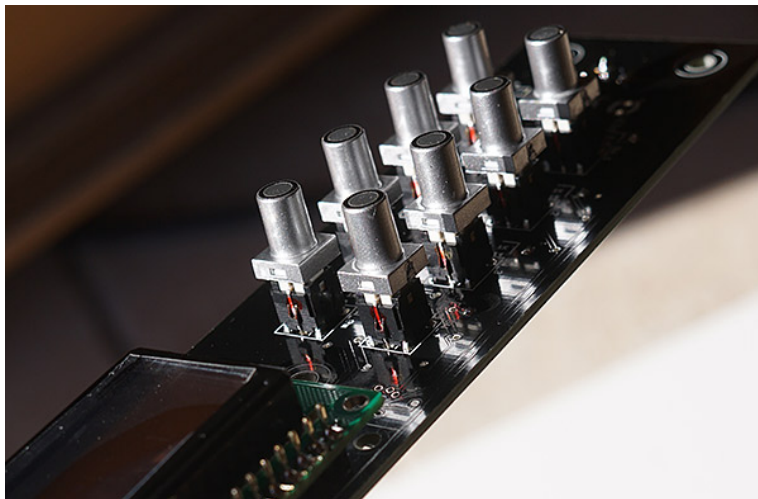
Be very careful on what side and what direction you solder the push buttons as it is impossible to unsolder them without damage. The coloured mark (a red varnish) must be on the screen side.


To make sure that the push buttons are perfectly flat on your PCB, before soldering, using the tip of a box cutter you must cut the little pin 0.4mm long (and nothing else).

The LCD screen is soldered/fixed on a 16-pin strip. The short side of the pins goes through the PCB while the long side receives the screen.

For a good mechanical fit when assembling the front panel and the correct pressure of the LCD on the plexiglass protecting the screen, when soldering you should leave a 1mm space between the pins' support edge and the inside of the LCD screen (see photo above).
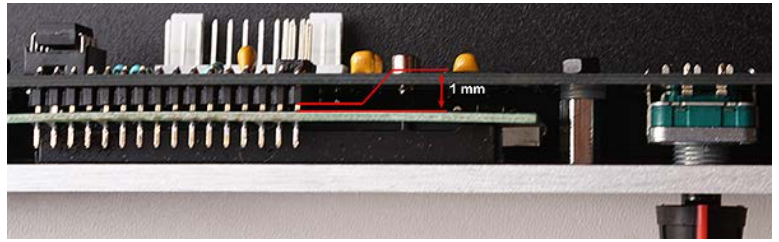
Next from a thick piece of cardboard cut out a shape twice the size of the LCD screen, bend it in two and slip it between the LCD and the PCB to form an insulating layer.

Inserting the LEDs WITHOUT SOLDERING

Install the 3 LEDs on the PCB but do not solder them. Spread slightly the feet of the LEDs on the other side of the PCB to stop them from falling. Pay attention to the polarity of the LEDs, the longest foot is the +.
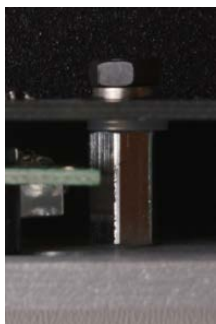
Assembling the case

Burring lightly the inside of the front

It is recommended to lightly burr the inside of the front (on the side opposed to the inscription) if you want the LEDs and the push buttons to fit easily in their places.

Take a drill bit for metal of >=ø8mm and give it only a turn or two manually without applying pressure.

Fastening the panel card on the front

The command card is fixed to the front on 6 points (D on on http://www.baloran.com/Triko/Kit/Assemblage.jpg) . Start by inserting two nylon washers then place the braces on the PCB (see photo on the left). On the other side insert a serrated lockwasher before the nut (on the photo we used a split washer :)) and tighten the nut (moderately).

Next put the front panel on a table with the inscription facing down. Use two wedges on the sides to raise it from the surface of the table to avoid touching the encoders' axles and the push buttons. Prepare six stainless steel hex screws and a matching screwdriver.

Remove the film from the protective glass and put it in position. It must be pushed in until it touches the inscription side of the surface.

Put in the PCB. The LCD must come in contact with the glass. Clamp the sandwich between your fingers so that it does not move and fix quickly the two screws on both sides of the LCD to immobilize it together.

Check that you have not trapped any dust between the LCD and its glass :)

If everything looks OK affix the other four screws.

Insert the ON/OFF switch in its position, electric terminals on the side opposite the PCB.

Soldering the LEDs after setting the depth

You can now push the LEDs into the front panel, all to the same depth. Ideally they should be flush with the surface. Solder them on when you found the correct position.

Making the connection cable

Follow very precisely the scheme below: http://www.baloran.com/Triko/Kit/Nappe_fils.jpg
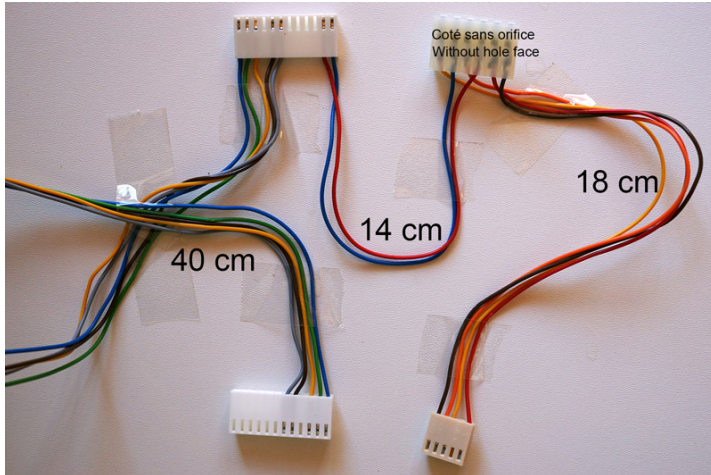
It is not absolutely necessary to use a crimping tool for the electric terminals but if you don't then you need to be much more careful. When you finish making the cabling check each contact with a controller.

Crimping the wires of the power connections

It is highly recommended to use a professional crimping tool. Your safety depends on it. Consult the photos and the electric terminals delivered with your kit to prepare the contacts.

http://www.baloran.com/Triko/Kit/Alim_1.jpg

http://www.baloran.com/Triko/Kit/Alim_2.jpg

http://www.baloran.com/Triko/Kit/Assemblage.jpg

Assembling the bottom of the case

The bottom plate has the inserts for fixing the elements. The ventilation holes are at the back of the case. The sides of the case (molded aluminium) are fixed to the bottom by inserting three nuts in the corresponding grooves. You have to glide each nut in the corresponding position and then screw the black countersunk Philips screws.

Fastening the IEC socket and the power plate

Fasten the IEC socket with the Philips stainless steel screws and add a serrated lockwasher and a black nut on the other side (G on http://www.baloran.com/Triko/Kit/Assemblage.jpg).

File carefully the top of the two marks F. This removes the paint and guarantees a good electric contact with the plate.

Fasten the plate with four stainless steel hex screws and a split washer between the top of the PCB and the head of the screw. *Verify with the controller the electric continuity between the electric earthing terminal of the power plate and an unpainted part of the case..*

Fastening the front panel

Fasten the front panel to the casing using the four stainless steel hex screws.

Next place on each aluminium profile the three nuts which allow to fix the top of the rack (the marks E on http://www.baloran.com/Triko/Kit/Assemblage.jpg).

Fastening the back panel to the connectors of the main card and to the casing

Place the main PCB on the back panel and fix them together with a few jack nuts without tightening. The final tightening is done when everything is in position.

Fasten the XLRs to the back panel (marks B on http://www.baloran.com/Triko/Kit/Assemblage.jpg) with 2.5mm diameter Philips screws and the corresponding nuts. You don't need to add a washer.

Fasten the back panel to the casing without tightening the four black hex screws.

Fasten the PCB on the bottom (mark A on http://www.baloran.com/Triko/Kit/Assemblage.jpg). Do not tighten too much the four stainless steel hex screws. Add a serrated lockwasher between the upper side of the PCB and the head of the screw.

Installing the power cabling and connectors

Consult http://www.baloran.com/Triko/Kit/Assemblage.jpg for the correct procedure.

Powering up, checking voltages on all the IC supports and on the display

Warning! This is an "open frame" power supply, it does not have a protective cover. It is a Meanwell switch-mode power supply (SMPS) of high quality which could be lethal on the high voltage parts.

Therefore whenever working on the appliance connected to electricity, cover the power supply with a thick piece of cardboard (at the very least!) to protect yourself against accidental contact.

After a thorough checking of the connections switch on the power. The LCD screen should light up. Quickly set the adjustable (near the L mark on http://www.baloran.com/Triko/Kit/Assemblage.jpg) so that you can read correctly the screen indications.

For instructions on how to check the voltage consult this document:
http://www.baloran.com/Triko/Kit/CheckVoltage.jpg

Inserting all the IC on their supports

Disconnect the power and insert all the IC on their supports. Make sure to match correctly the mark on the PCB with the mark on the support and on the integrated circuit.

Insert also the memory on the command card.

If you have the FV-1 put it in place and fix it on the brace with a stainless steel hex screw and a serrated lockwasher. Connect the cable provided with the FV-1 (mark C on http://www.baloran.com/Triko/Kit/Assemblage.jpg)

If you don't have an FV-1 install the two jumpers provided on the first 4 pins of the extension cable (mark K on http://www.baloran.com/Triko/Kit/Assemblage.jpg)

Power up, updates and setup

After a thorough verification power up the appliance. The LCD screen should light up and there should not be any smoke. The assembling of the kit is finished, well done :)
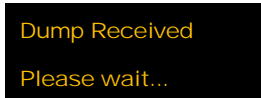
Updates and setup

Connect a Midi cable between the MidiIn socket of The Triko and your computer. Using a software program like MidiOx (or any other software capable to send a Midi flux) send to The Triko the following file:

http://www.baloran.com/Triko/Updates/Usine.syx

The Triko displays:

```
Dump Received

Please wait...
```

When the transfer has finished The Triko contains all the "factory" programs. The last three are dedicated to The Triko setup.

Setup instructions

Setting the modulations' amplitude

Select the program *Setup 2*

- With TR2 set 4.5v on the pin 8 of a TL074.

Select the program *Setup 3*

- Connect an oscilloscope on the pin 8 of a TL074. Adjust TR2 to obtain the sinusoid of maximum amplitude without deformation.

Setting the clocks

Select the program *Setup 1*

- Chorus 1 : connect a frequency meter, a digital oscilloscope or a controller which has this function on the pin 4 of IC6 (MN3101). Set R94 on a 200kHz frequency. On this panel select Chorus 1, Delay = 200. The frequency must go down between 25kHz and 30kHz.

- Chorus 2 : repeat the setting with IC2, R24, Chorus 2

- Chorus 2 : repeat the setting with IC18, R113, Chorus 3

Setting the BBD offset

Select *input 1*, level = +10, pano < >.

- Inject a 2v peak to peak triangular or sinusoidal signal, 400Hz-800Hz on this input.

- Chorus 1 : Connect your oscilloscope on R87 on the C44 / C51 side. Adjust R100 to bring it closest to perfect symmetry. Lower the level to +7, saturation should have disappeared. Check that the symmetry is as close as possible to perfection. Adjust R100 if necessary. If you work without oscilloscope and you connect The Triko to an amplifying device (preferably headphones) the most

symmetrical signal corresponds to the weakest harmonic level. Changing from that position on either side increases the harmonics presence.

- Chorus 2 : repeat the setting with R31, R16

- Chorus 3 : repeat the setting with R119, R64

Setting the LEDs levels

Without changing anything to the previous settings and to the signal injected into input, adjust the level of input 1 to give you a signal of maximum amplitude without distortion on R87, R31 and R119. It should correspond to level +6 or +7.

- Set TR1 to the point where the red LED lights up.

Later, after gaining a bit of experience with The Triko, your ear will be your best measuring device. You will be able to adjust TR1 when the red LED lights up too soon or too late.

Setting the "flanger" feedback

Select Setup F or the program BikoFlan on Bank 1. Connect The Triko to an amplifying device and a sound source on input 1.

- Adjust R163 until you obtain what is for you the most musical effect.

Download the files

http://www.baloran.com/Triko/Updates/TrikoMain.syx

and

http://www.baloran.com/Triko/Updates/TrikoPanel.syx
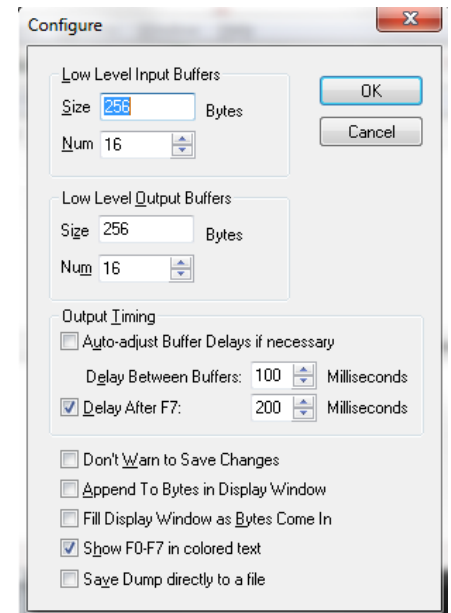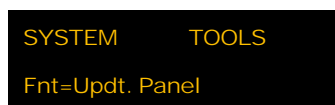
Connect a Midi cable between the MidiIn socket of The Triko and you computer. Configure the software to allow it to send SysEx updates to The Triko. For MidiOX use the settings in the figure to the right.

- Prepare the file TrikoPanel.syx uploading it in the software.
- In the system menu of The Triko choose as below and press the encoder.

```
SYSTEM        TOOLS
Fnt=Updt. Panel
```

- Following the instructions, switch off The Triko, wait a few seconds then power up again.
- The level LEDs should blink.
- Send the file.
- The level LEDs light up in turns showing the firmware upload. Once the upload has completed the LEDs blink and The Triko restarts.

- Prepare the file TrikoMain.syx uploading it in the software program.
- In the system menu of The Triko choose as below and press the encoder.

```
SYSTEM        TOOLS
Fnt=Updt. Main
```
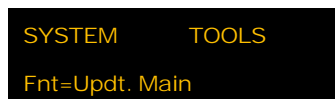
- Following the instruction, switch off The Triko, wait a few seconds then power up again.
- The push buttons' LEDs blink.
- Send the file.
- The push buttons' LEDs light up in turns showing the firmware upload. Once the upload has completed the LEDs blink and The Triko restarts.

That's all :)