Manual Trautonium VT 2012

DRAFT Version of the Manual

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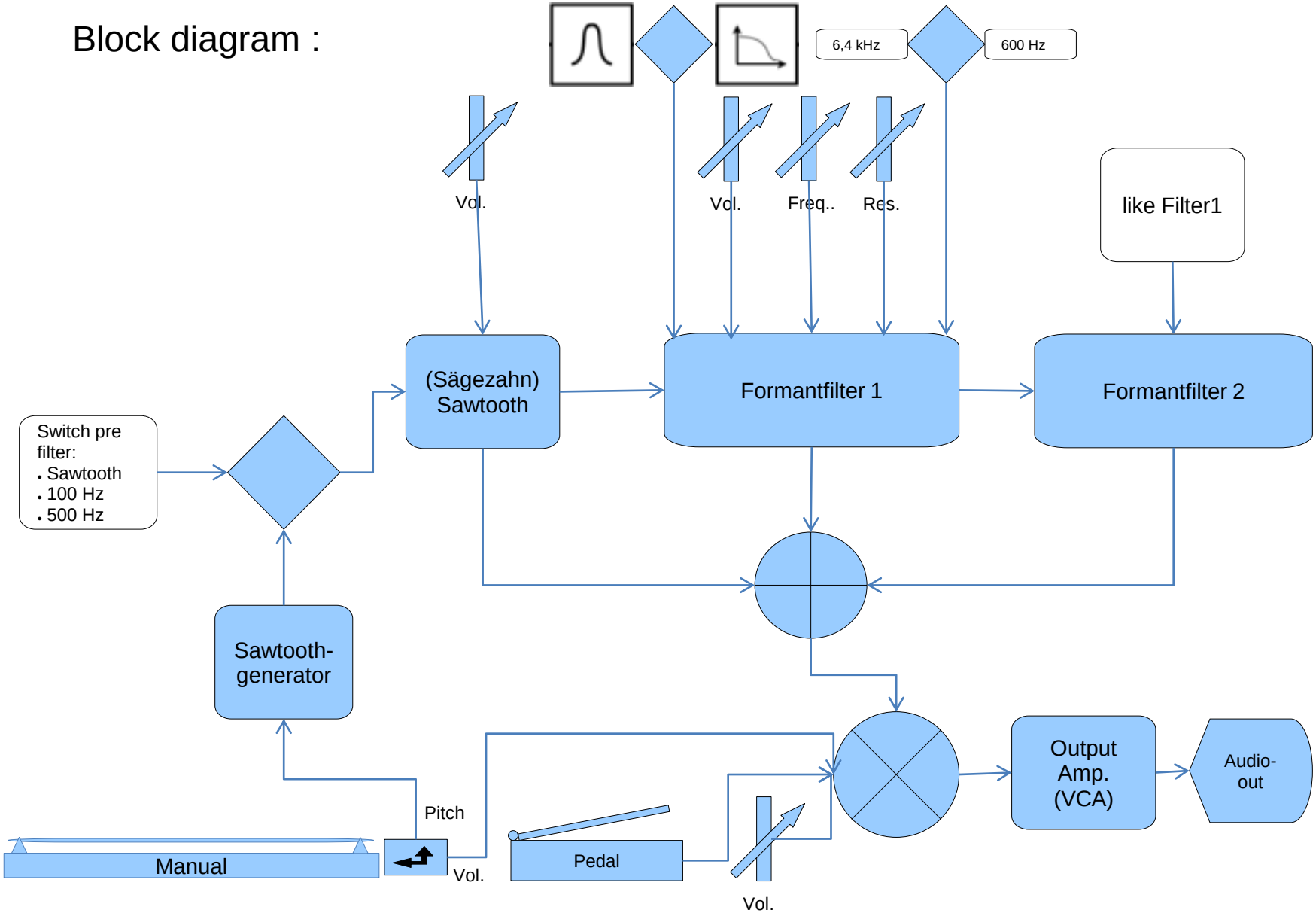
Content:

Block diagram :



Controls on the front:

Generator:

1) Switch for Octave
2) Pitch - coarse
3) Pitch - fine
4) Dynamics Setting
5) S:Adjustment String
6) W:Adjustment Scale
7) LED: Gate/String

Sawtooth(Sägezahn):

8) Vol. Sawtooth
9) Switch prefilter
   - 100 Hz
   - off
   - 500 Hz

Formant-Filter 1 and 2:

10) Vol. Filter
11) Frequency
12) Resonance
13) Switch: Frequency range
   - 640 Hz
   - 6 kHz
14) Switch: Type of Filter
   - BP: Bandpass
   - TP: Lowpass

Out (Ausgang):

15) Switch Source:
   - Sawtooth
   - Filter 1
   - Filter 2
   - Filter 1 + Filter 2
16) Master volume

2. Functionality And Controls

Explanation of the controls:

1) Switch for octave selection:
   0: Pitch range: ca. F1 to c2
   1: Pitch range:: ca. F to c3
   2: Pitch range:: ca. f to c4

2) Coarse frequency control:
   The coarse frequency control potentiometer has a pitch range of about one octave.

3) Fine frequency control:
   The fine frequency control potentiometer has a pitch range of about 1/3 octave.

4) Dynamics control:
   The dynamics control poti changes the dynamics characteristics of the manual.
   Poti to the right: direct response – short stretch for full volume
   Poti to the left: fine dynamics control – longer stretch for full volume.

5) Trimpot for String adjustment:
   If to apply a new string, or LED7 shines green or brightly red without pressing then you have to adjust the string:
   (Adjustment see: Service And Maintenance)

6) Trimpot for scale adjustment:
   Use that pot to adjust the distance between the octaves on the manual.
   Normally the distance between the octaves is adjusted to 18 – 19 cm - depending on the players fingers and special wishes. After changing the scale, you have to re-arrange the auxiliary keys to the new pitch.
   (Adjustment see: Service And Maintenance)

7) Duo-LED (red/green):
   Without pressing the string the LED should shine slightly red or being off.
   If LED shines brightly (red or green) without pressing the string, you have to adjust the string using pot 5).
   If string is pressed the LED should shine green and shows the GATE signal.

2. Functionality And Controls

Explanation of the controls: (continued):

8) Volume Control for Sawtooth: The sawtooth generator has – like filter 1 and filter 2 – a separate volume control. So the volumes can be adjusted to the same level when changing the output source. Up to 80 % it works like a normal volume control. If set higher it will go into distortion mode for getting some non-linear distortion to produce some more sound variations. The volume control only is active if the sound selector is switched to “S”.

9) Pre Filter Switch:
If in middle position, the sawtooth signal goes unchanged to the output and the formant filters.
If switched up or down you can add a passive low pass filter working at 100 Hz or 500 Hz. This is sometimes used to make the sound a bit like a sinus, to produce some flute like sounds. The passive Filter also has influence on the formant filters.

The controls 10) to 14) are the same for Filter 1 and Filter 2

10) Filter volume control:
Up to 80 % it works like a normal volume control. If set higher it will go into distortion mode for getting some non-linear distortion.

11) Control for filter frequency:
For adjusting the cut-off frequency. The range can be changed using switch 13).

12) Control for filter resonance:
Filter1 is set up a bit sharper then Filter 2. So you can get Filter 1 to oscillate with high resonance and high filter frequency. Filter 2 is a bit smoother and will not oscillate.

13) Switch for cut-off frequency range:
You can switch between two frequency ranges: 640 Hz and 6 kHz.

14) Bandpass (BP) / Lowpass (TP) selector:

2. Functionality And Controls

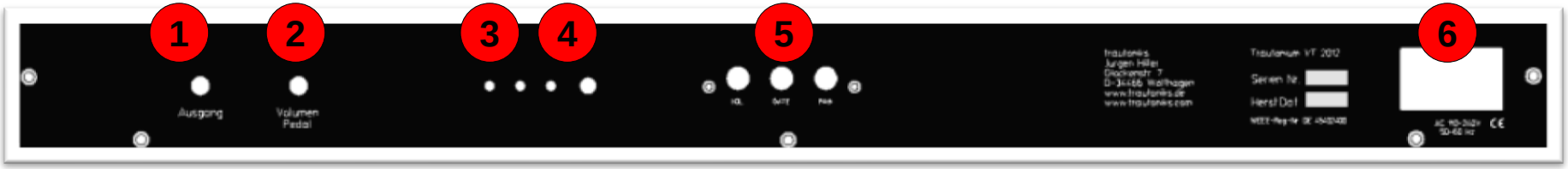
Explanation of the controls: (continued):

15) Source Selector:
Here you can select what source will be routed to the output.

S: Sawtooth without formant filters. But with pre filter, if selected.
F1: Formant filter 1
F2: Formant filter 2
F1 + F2: Filter 1 and Filter 2 together – the filters are set parallel.
So you can setup both filters different and get two formants.
Or you can setup one filter for octave 1 and the second for octave 2 – in case you want different sounds for both octaves you just need switch the octave selector and not both.

16) Main volume control:
If you want to get the full dynamics range for the manual – set the main volume control to a high level.

3. Backplane



1) Ausgang:
   Audio output – studio level: ca. +6 dBu

2) Vol. Pedal:
   Input for expression-pedal (volume pedal) with ca. 50 kOhm
   (like: Yamaha FC7)

3) LED's for internal power.
   + 15V and – 15V

4) LED and trimmer (do not change without need) for dynamic function monitoring.

5) CV / GATE outputs:
   CV Pitch: 0-3,5 V (just the manual's pitch).
   CV Volume: 0-5 V
   Gate: 0-5V

6) IEC (power) connector with integrated mains switch and twin fuse.
   Twin fuse:
      There are 2 fuses with each : 1,4 A T
      The fuse holder can only be opened when mains cable is removed.

4. Preparations And Operation :

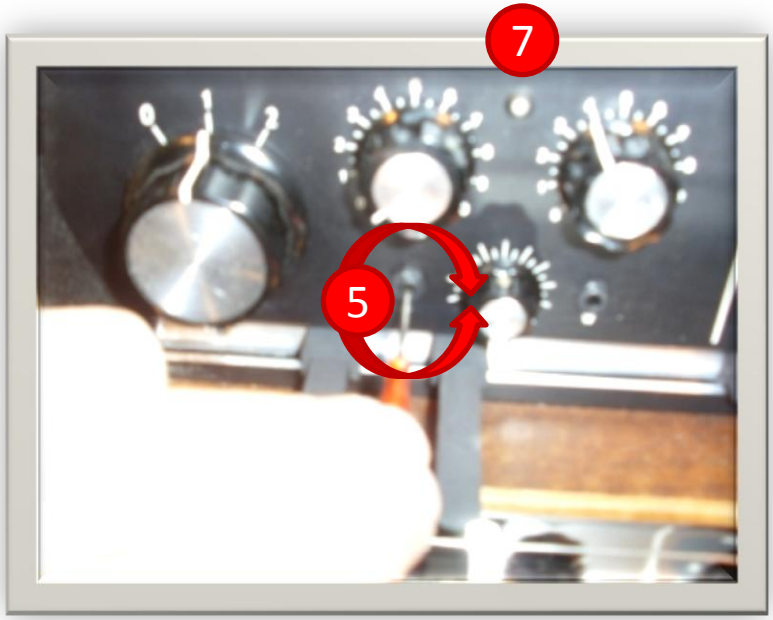
1) Connect the instrument to the mains and switch the power on.
Wait 5 to 15 minutes (depending on temperature and environment) before starting playing or making adjustments.
Then the tuning and string setup should be stable.

2) Check String Setup:
If LED (7) shines brightly (red or green) **without pressing the string**, you have to setup the trimpot for string adjustment (5).

3) String Setup:

Use a thin screwdriver on trimpot (5) to adjust the string. All with string NOT pressed.

If the LED (7) shines brightly red you have to turn the trimmer to the left until the LED goes dark – and then a little back to the right to make the LED shine slightly red.
If the LED shines green, you have to turn the trimmer to the right until the LED goes dark – and the a little bit more to the right until the LED shines slightly red.

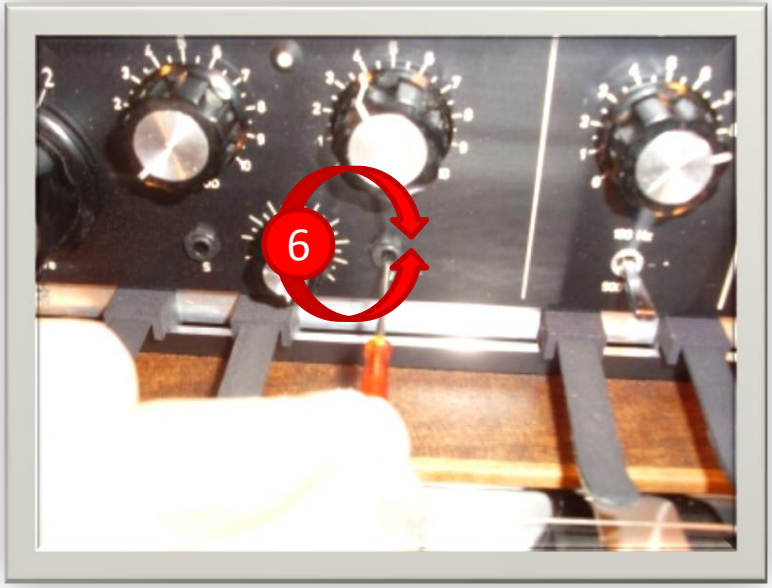


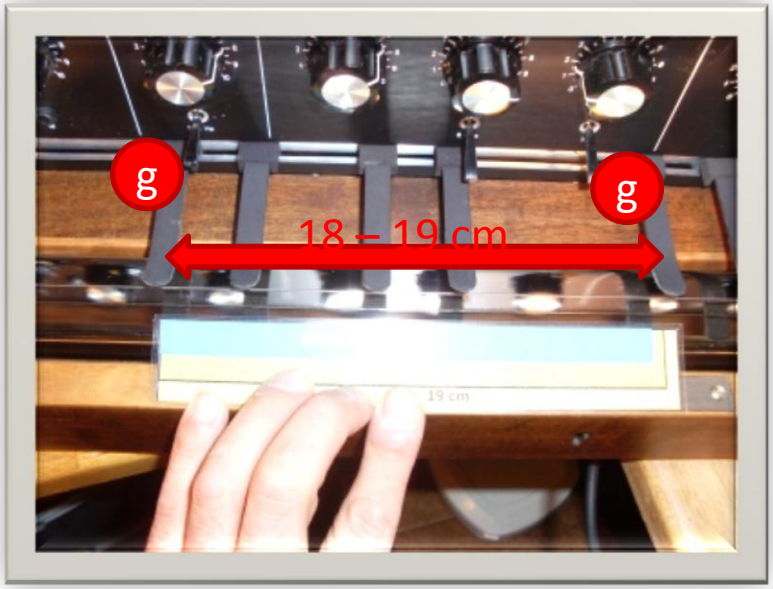
4. Preparations And Operation (continued):

4) Changing the pitch:
Use the trimpot „M“ (6) if you want to change the distance of the notes and octaves.

Normally the distance between the octaves is set up to 18 – 19 cm. That depends on the thickness of the players finger or his preferences. The best playing is possible if the distance of a half-tone is about one finger.

For setup you can use the distance template that comes with your Trautonium.



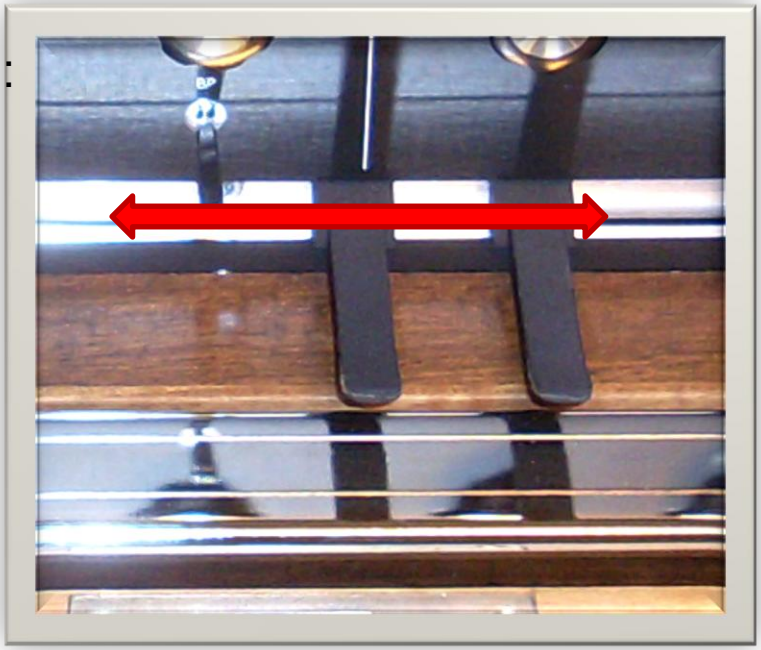


The pitch range of the 70 cm playground is about 3 octaves.

The setup is done best in the middle of the playground.

(In the picture you see a example using the notes ‘g’ and a octave distance of about 18,5 cm)

4. Preparations And Operation (continued):

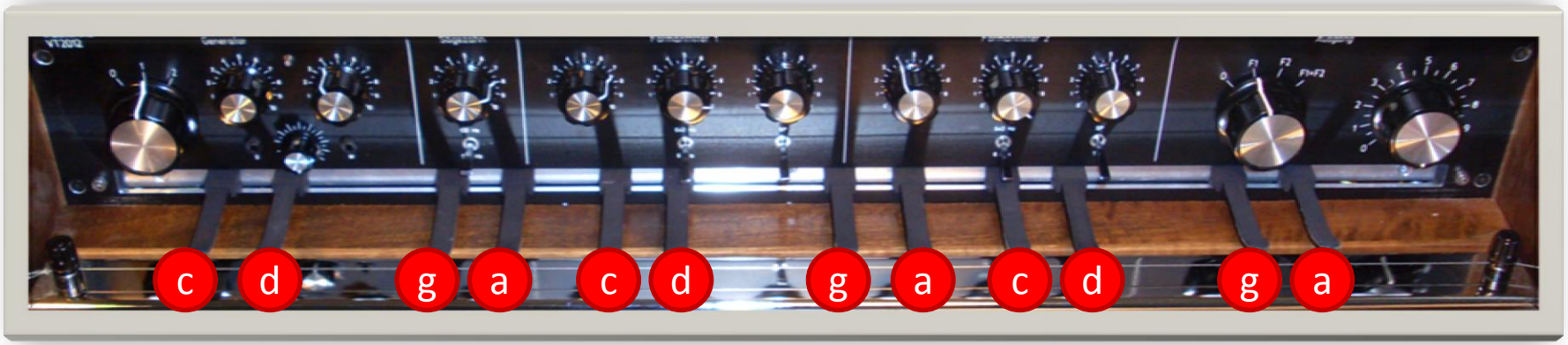


5) Setup the auxiliary keys:

The auxiliary keys can be used - by pressing on the string – to play exact notes. Or they can be used just as visual markers, pressing the string without aux keys.

The aux keys normally are used to mark the notes ‘c’, ‘d’, ‘g’, ‘a’.
If you prefer another notation, you can change them to your needs.

You can move the aux keys to the left and right. So you can set them up to the notes using a tuner. Tuning is best done with filters off.



4. Preparations And Operation (continued):

6) Replacing the auxiliary keys:

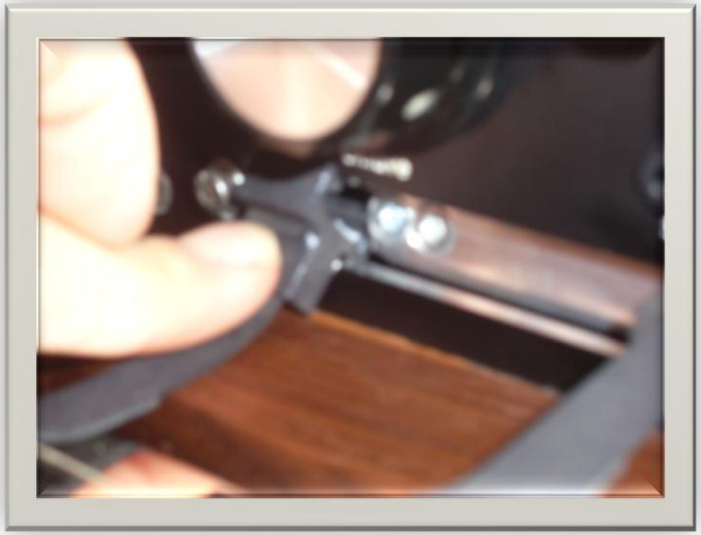
There's a aperture on the left of the auxiliary keys holder, witch can be used to replace broken aux keys, or to replace the soft touch pads.

(To replace the soft pads on the keys: remove old pad completely and clean the key with some cleaning liquid, before applying the new pads).

Move the aux key to the aperture at the left of the rail an press on the top of the key (see picture).

Then you can pull it out of the aperture.

To mount a aux key, just bring it to the position shown in the picture move it up and get it on the rail.



4. Preparations And Operation (continued):

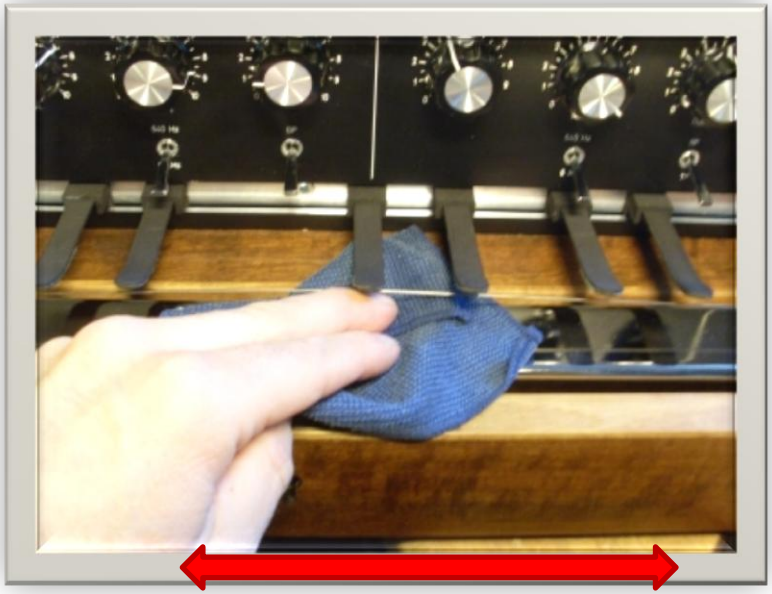
7) Service and Maintenance:

- The string and the playground are in permanent contact with the skin of your fingers.
  Your skin has natural grease and acids on it – that will stick on the string and the playground as contaminations on the surface.

  Those contaminations will lead into bad contact what means bad tones, interferences, noise.

  So you have to clean both playground and string from time to time, using a micro fiber sheet or a sheet for cleaning spectacles.

  Polish the playground until no contaminations left. Best polish it before and after you use it.



- The playground consists of brass with a thin layer nickel on it. That has been established over decades as the best playable surface.
  You will see fine scratches after you play a while. Those scratches will not effect the quality of the play.
  It is just a optical effect and unavoidable.
  Oskar Sala used to play it's manuals even when the brass came out after decades, without any technical restriction.

4. Preparations And Operation (continued):

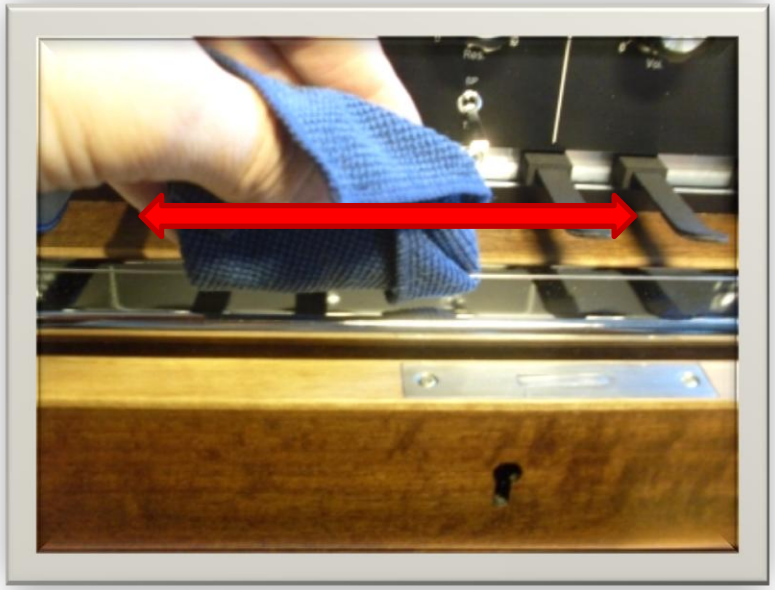
- Same for the string:
  Move the cleaning sheet three or four times to the left and the right over the whole length, to remove the dirt.

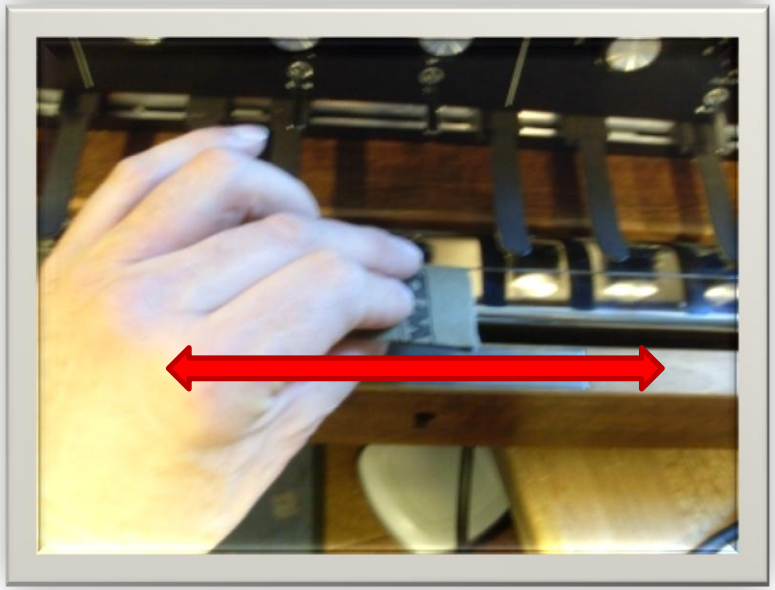
- Sometimes (especially on new strings) it can happen that the isolation of the resistance wire comes to the front on some spots, what means the contact between string and playground is bad. Then you will hear some noise, interferences or nothing on that spots.

  If cleaning will not work on that spots, you have to use a small sheet of finest sandpaper (granulation: 600 to 1000 / comes with the Trautonium) on the string.

  Wrap the sandpaper around the string, and hold it between thumb and forefinger.
  Move the sandpaper - with smooth pressure - over the whole length of the string, for two or three times.

  After that clean the string like described above.





4. Preparations And Operation (continued):

8) Replacing the string:

A Trautonium string has a very long lifetime. As long as it has no mechanical damage, it will work for decades.
Anyway there is a replacement string that comes with your Trautonium.
If you need more, you can order one of that special made string at a price of about 52 EUR incl. VAT.

To replace the string do as follows:

→ Open both string holders, by turning the top a little to the left
→ Remove the old string, by pulling them of the holders.
→ Thread the string in the small holes of the holder starting on the left holder (loop on the left side).
→ Lock the string holder on the left side (not to tight).
→ Thread the string in the small hole of the right holder and lock the holder, when you have the desired string tension.
→ Check the string tension and readjust if necessary.
→ Cut the string on the right side to a supernatant of about 5 to 8 mm.
→ Place a drop of superglue on the cut end - to prevent string from unwinding.
→ Setup the new string as shown above – using trimpot (5) and LED (7).
→ Check the playability of the string and sandpaper if necessary (as shown above).

4. Preparations And Operation (continued):

9) Replacing the fuses:

If the devices does not work and the power LED's do not shine.

Maybe the one or both fuses are fused .

The fuse are mounted in the power connector:

First you have to unplug the mains connector, otherwise the fuses holder will not open.

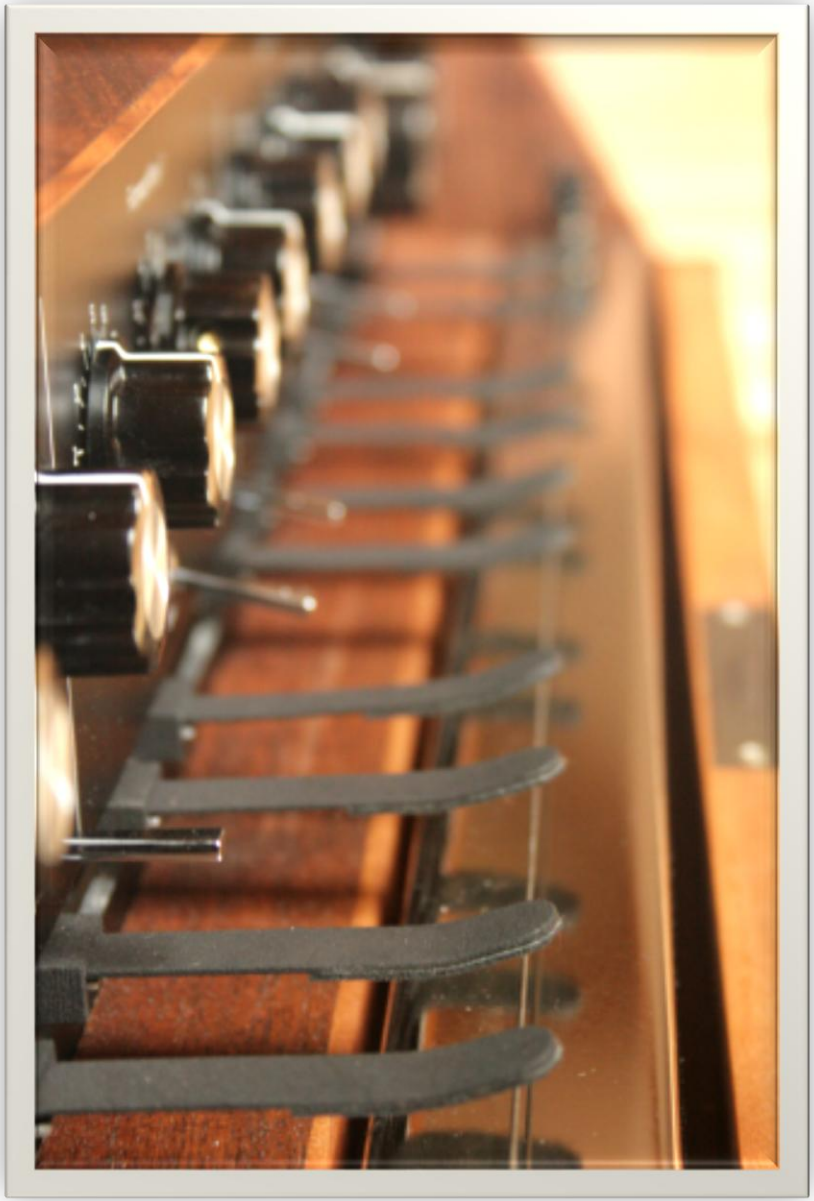
Then you need to have to open
the two noses on the top and bottom
of the holder using your fingers or a
screwdriver:

Get the holder out,
replace the broken fuse
and put the holder back to it's place:

Replace the fuse with 1,4 A T only.

5. Technical Data:

- dimensions : 26 cm x 25 cm x 74 cm
- weight: ca. 12 kg
- delivery time: ca. 6-10 weeks
- sound generation: analog with sawtooth generator
- filter:
    - 2 active formant filters with ca. 12 dB/oct
    - 1 passive RC filter.
- Output level: ca. 1.4 Vss
- power consumption: ca. 35W at 230 V
- CV/GATE – Outputs for controlling analog synths:
    - 0-5V
- note range ca. F1 to c2.
    - octave switch:
        - Note range 0 about. F1 to c2
        - Note range 1 about F to c3
        - Note range 2 about. f to c4
- dynamics stretch:
    - Adjustable from 2 mm to ca. 1,5 cm
- for volume pedals from 25 – 250 k



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