

theremino
•the•real•modular•in-out•

System theremino

Theremino MCA - V4 Starting Guide

Quick guide to start

Introduction

This manual is intended for a quick start with the PMT Adapter kit.

Further references in the other guides attached to the Theremino MCA program from : www.theremino.com/downloads/radioactivity

Kit Contents:

- Shielded Cable 1
- USB Sound Card 2
- Cable for PMT 3
- Power pack 4
- PMT 5



Shielded cable is recommended to keep it connected to the audio card

This should be the sequence of connection:

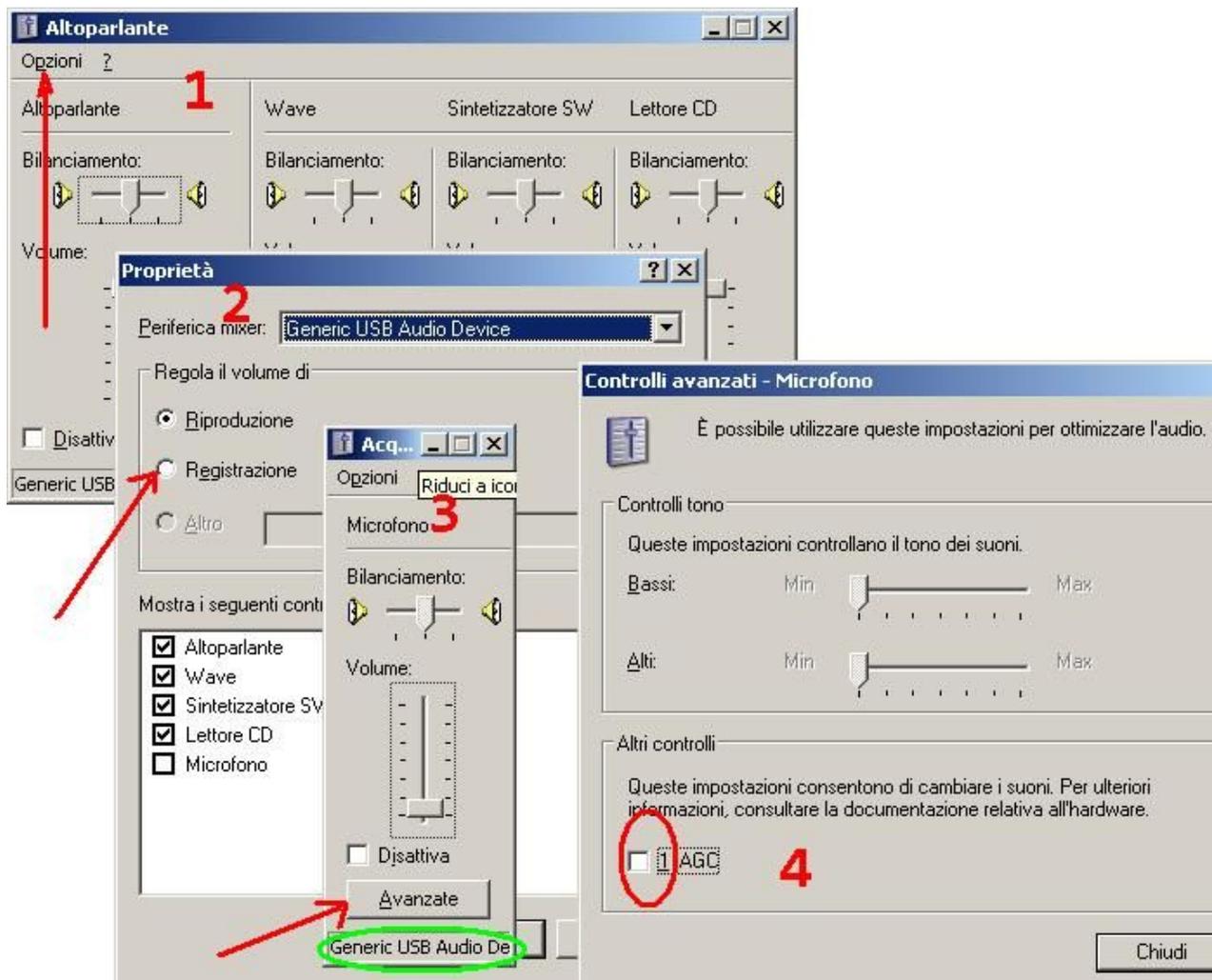
- 1 Connect the jack of the audio cable to the power supply, making sure that the connector is firmly inserted
- 2 Connect the sound card (already inserted with the audio cable) to a PC's USB port

The Red LED will light after a few seconds, if it does not do so after a few seconds, check the connections, if in doubt disconnect and reconnect.



The first time you put the card USB Audio will take a few seconds for it to be recognized by the system, no need to install driver, it is advisable to do this the first time with the single card without power supply.

Card installed, you can open the settings of the sound card



Check in paragraph 4 that AGC is not "checked"



Changing the USB slot often the AGC is activated, always check if you are unsure.

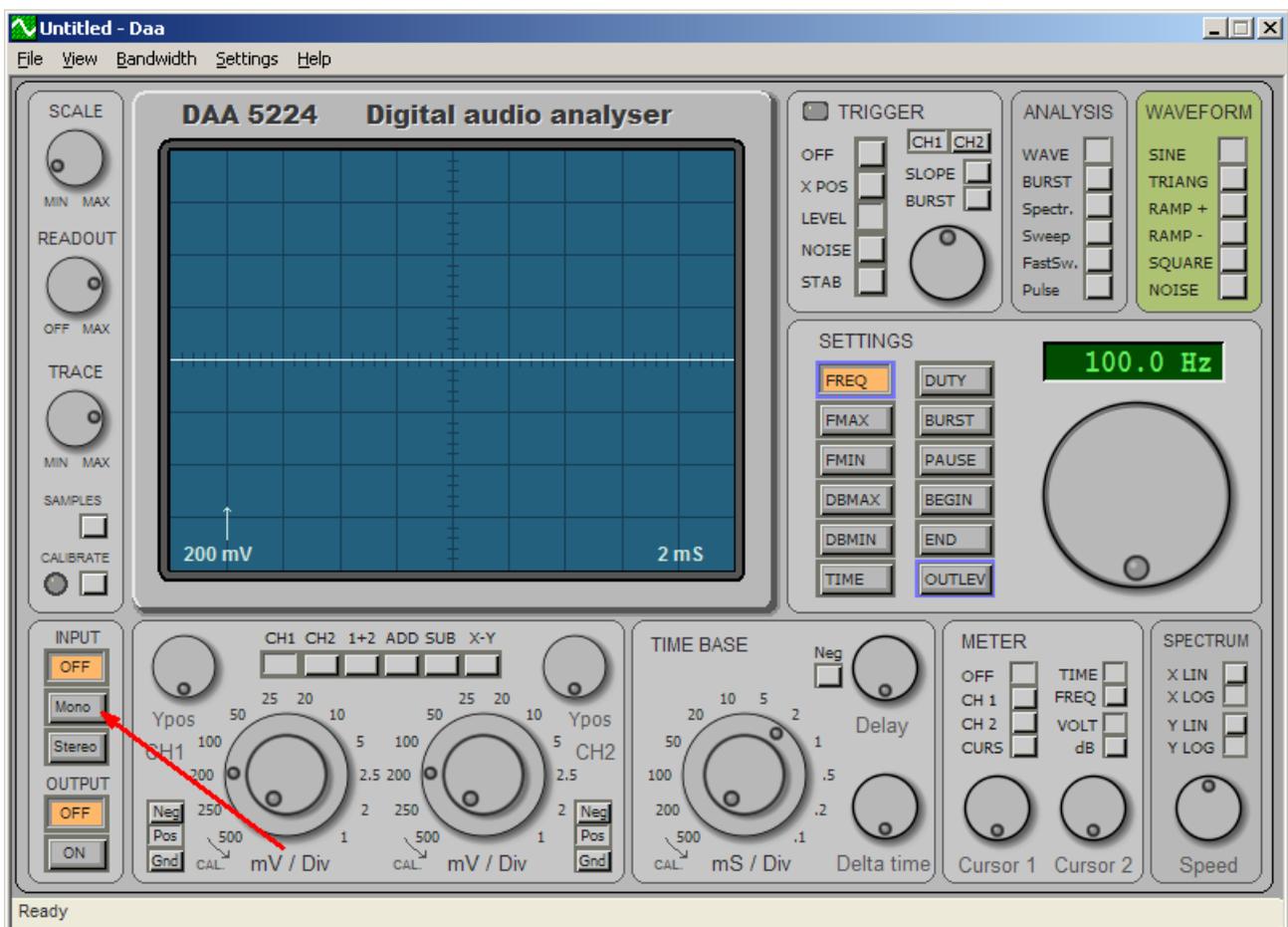
For adjust the sound level must be a very useful program called DAA

This utility acts as a virtual oscilloscope on PC and allows you to adjust / analyze the audio level with great precision.

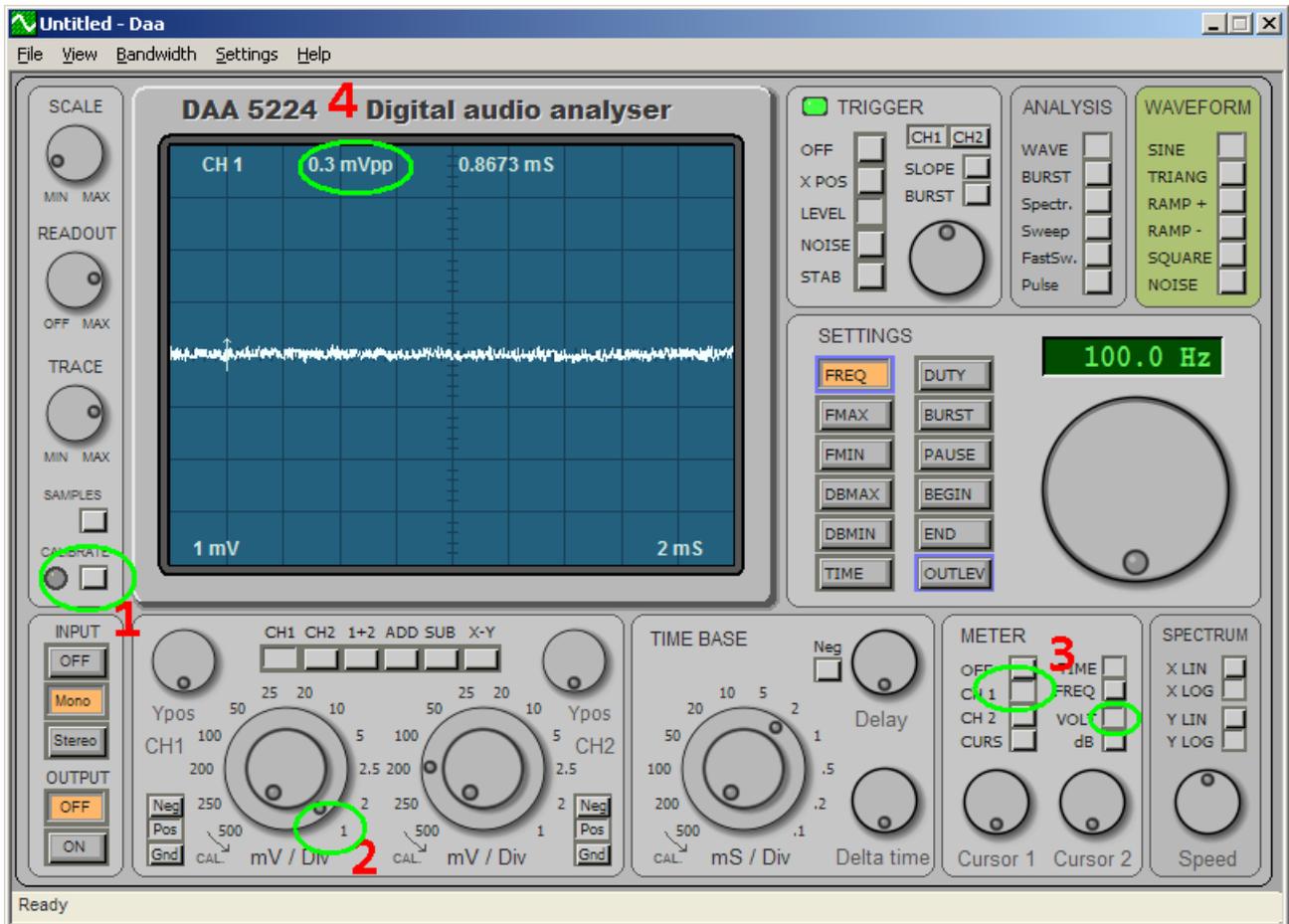
You can download it from the site Theremino this is the link:

http://www.theremino.com/wp-content/uploads/2012/03/DAA_V2.3.zip

here's how to use it:



press the **Mono** button to turn it on

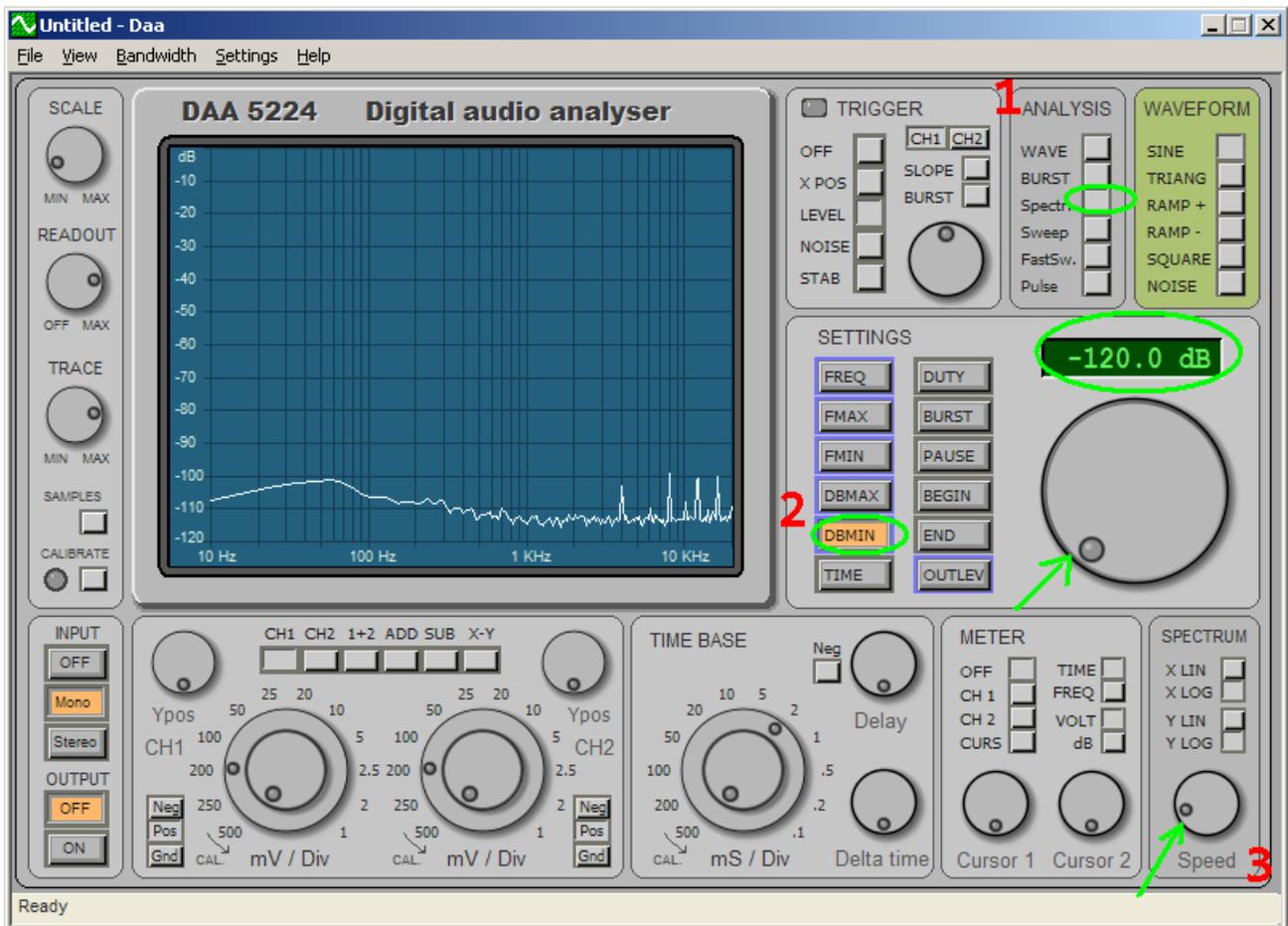


- 1 you click on the button "Calibrate"
- 2 is adjusted to 1mV per division
- 3 you select Ch1 and Volt
- 4 controlling the noise, the optimal with only the sound card is from 0.2 to 0.3 mV p/p

In the case of noise greater than 0.4 mV close the program and move the USB sound card on another port you can on some PCs have some USB ports more "noisy" than others.



We can also use a USB extension cable to remove the card from the PC Audio.



Now we go to controlling the spectrum.

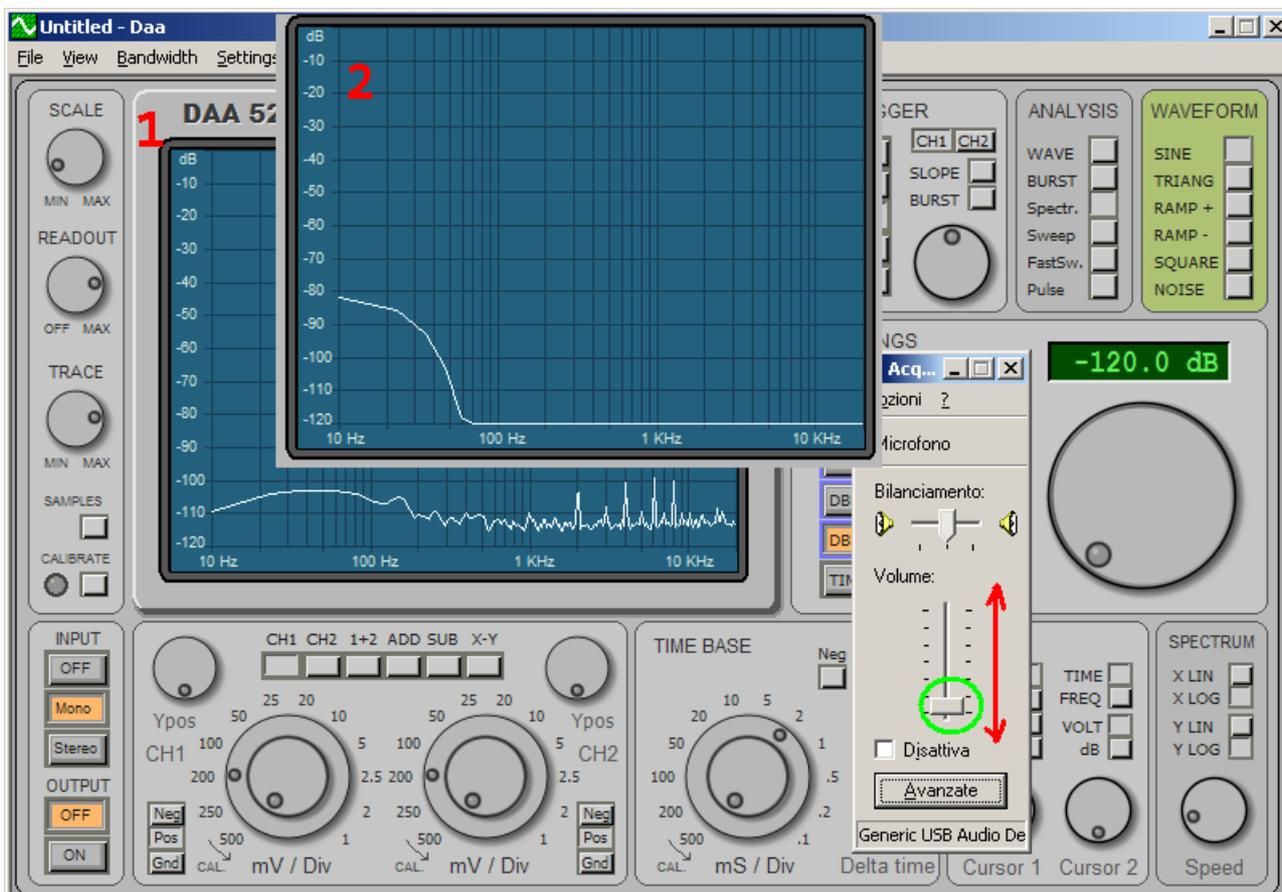
- 1 you click on the button "spectr."
- 2 you choose "DBMIN" and regulate -120dB to bring up the spectrum.
- 3 it slows down a bit the display speed of the spectrum.



The LED on the Audio tab normally is on, blinks when Send / receive data from USB

Now we have to adjust the sound level, here's how to proceed:

Repeat steps 1 and 2 on the properties of the Audio tab and open the Audio Adjustment



Adjust the keyboard with the arrows "Up" and "Down" to lower the cursor to the spectrum as in step 2
At this point go back (arrow) of that little to reappear spectrum.

Adjusting voltage on the power supply

The voltage is adjusted according to the tube used, it acts on the gain of the tube amplifying the output signal.

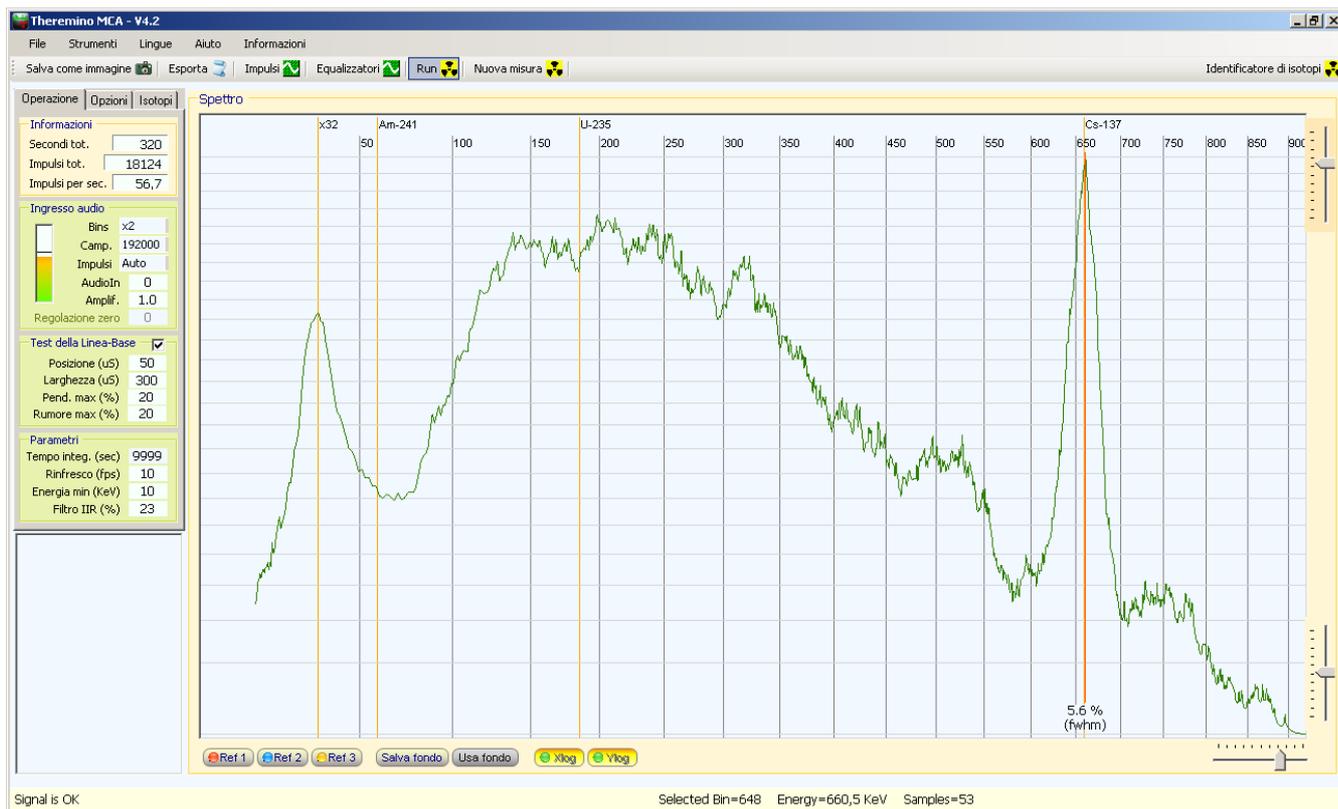
Depending on the: **voltage of the photomultiplier tube**
and: **Luminous Efficiency crystal scintillator**
will be necessary to use a different power supply voltage of the tube.

So it is important to experiment by adjusting the voltage so as to obtain the energy scale calibrated, with the settings of the program Theremino MCA approximately halfway.



it is normal to hear a slight hum when the power supply is turned on, this noise is due to operating frequency is in the audible spectrum.

The set Used in this manual provides the use of a photo multiplier tube together with a scintillator crystal NaI (TI), the latter has an average luminous efficiency, for which the recommended voltage is around 800 V.



Example realized with this set, the sample is a valve Spark Gap containing traces of Cs137

Technical Features of the Kit:

Description

Complete set to make Gamma spectrometry using a PC

Photomultiplier tube Hamamatsu R6095 28 mm diameter 11-stage

Crystal scintillator Hilger Crystal_P1103 25x25 mm NaI(ti) better resolution 8% Cs137

Power pack High voltage ranging from 700 to 1500 V preamplifier module and adapter pulse.

USB Sound Card modified filter power attenuator 192 kHz maximum sampling

Shielded cable two poles + shield

RG58 cable



not exceed 1200 v voltage on the tube, after the voltage is not get no benefit of amplification and with time we can shorten the life of the tube

To make the measures we recommend to use our program naturally Theremino MCA downloaded free from here : www.theremino.com/downloads/radioactivity

with the program you will find all the necessary guides for the proper use.