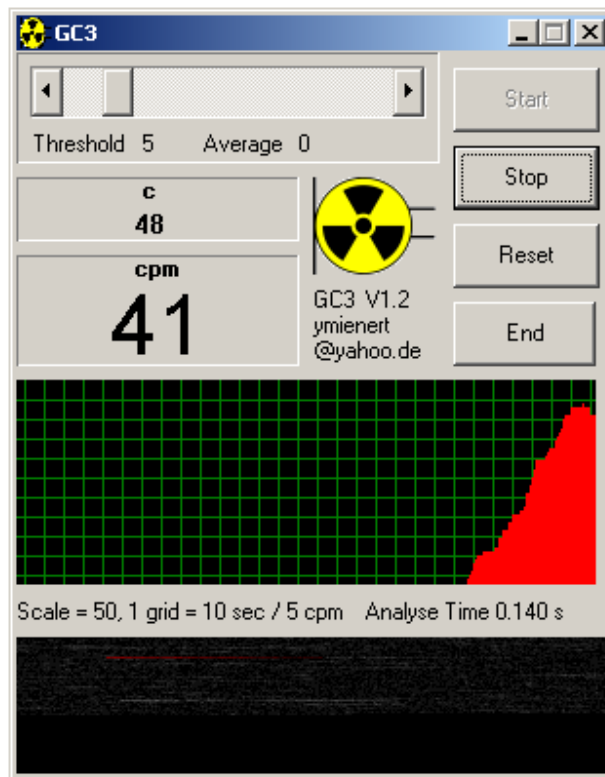


Manual GC3



- 1.) what it is
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- 4.) how to use
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1.) what it is

GC3 is a software that gives you the possibility to detect, measure and save the log from audio signals, which is recorded by pin diodes detectors or geiger tubes if there comes in contact with radioactivity emission. The main goal of the software is the ease of use and evaluation of quality and in quantity. The program is designed for use in command line environment. That is the reason why all parameters may be controlled by command line arguments. The idea is to use GC3 for time controlled measures with log output. May be that is the starting point to build a network of amateurs radiation detection stations like it is existing today working for weather conditions (Lightning Detection) or whistlers, tweeks e.t.c. In the May 2011 has Burhard Kaika published on his fine German site (<http://www.b-kainka.de/bastel131.html>) a simple circuit for detection by gamma emission on the microphone input on a soundcard and a little program with the name „gamma counter“. I build this circuit and want get more information by the software about the radiation. The first try to advance the „gamma counter“ possibility (GC2) i have stopped - my basic design was to bad . Now you receive GC3 written in C++ with Borland C Builder(6) with open ways for more extensions.

2.) what you need for using

GC3 needs a :

- PC with min. 500 Mhz (successfully tested with Pentium III 600 Mhz)
- OS Microsoft Windows 2000 (only SP4), XP, Vista, Win7 x86/x64

(GC3 is specially designed to run under Win7 without UAC : batch use)

- installed soundcard

- gamma microphone like decrypted on Burkhard's website

or

- geiger counter tube with connection to the microphone/line-input of the soundcard (here no quantity measure)

3.) command line parameters

All command line arguments start with '/'. Of course you can use a simple batch script(*.bat) to start the application all times with the same arguments.

List of arguments:

3.1) start

- starts the measure operation direct after program start
- for default the software is waiting for the start button

3.2) log

- writes one time per minute the counts per minute (cpm) in a log file
- for every day a new log file is created in this kind : 12.08.2011_gc3.log
- the value is written in an excel readable manner (date,time,cpm) like
12.08.2011 19:00:02 103
12.08.2011 19:01:02 139
12.08.2011 19:02:02 99
12.08.2011 19:03:02 101
- for default the log function is deactivated

3.3) logdir

- describes the log directory
- it is every time ending with a backslash „\“
- for default writes the software log to „c:\tmp“

3.4) tmpdir

- GC3 works strong with temporary files
- this argument describes the directory location of the temporary files
- it is every time ending with a backslash „\“
- for default writes the software the temporary files in the current directory

3.5) runtime

- gives the running time period in seconds
- the software is finished after amount of seconds
- for default the software runs endless

3.6) threshold

- describes the sensitive of measure
- for default the software uses a threshold by 4

3.7) fft

- opens a thin FFT(fast Fourier transformation) stripe to investigate the input signal
- for default the fft function is deactivated

3.8) hires

- opens an additional window with time line to measure the pulse length
- this option needs much more CPU and graphics resources (resolution higher than 1024 x 768)
- for the temporal orientation : the longest marker (also labeled with '10') means 1/10, the smaller one 1/100 second and the dots 1/1000 second
- the dimensions of this window can be changed also during the measure
- for default the hires function is deactivated

Here a example:

```
gc3.exe /log /start /threshold 4 /tmpdir g:\logdir c:\tmp\logs\gc3\ /fft
```

that means : starts gc3 with logging, the measure is beginning if the programm runs, sensitivity is set to 4, the programm shows the fft stripe, the log and tmp directory is redirected like to see in upper position

4.) how to use

The most difficult thing in work with low radiation measurement via sound signals is the weak signal/noise ratio. So it is very important to use a soundcard with low noise and hiss. The threshold must be set very carefully. If you set it to a small threshold (in direction to 1 or to left on the gui) GC3 count your noise on the input port, if you it set to high may be your radiations signals would be not counted. To avoid that you should use the fft stripe.



Here on this example you see a red marked line by a recorded emission which is counted. The white line deeper on the fft stripe shows a signal what is to weak to be counted on this threshold setting.

The threshold changes not the intensity on the fft stripe. That can you adjust with the volume control software for recording on your soundcard, related to your operating system. The threshold decides only that if the signal was counted or not. That means if the signal line be red coloured or it is not. More stronger radiation signals be more brighter in the fft stripe.

Before it is analysed writes GC3 every second the recorded signals on the hard disk . On a normal system is this operation not palpable. If you like use GC3 in long periods of time (one day or longer) it is could be a good idea to install a ram disk on your PC and redirect the temporary directory to this location.(see 3.4)

Of course, nobody used a new fast computer for measure and log activities. To test if the old one fast enough for this kind of operation it may be helpful to note the analysed time. It this time smaller than 1 second you will be on the right side.

If you have set the input sound level to zero but the label Average shows you still signals level over zero, your soundcard may be to rustling for this operation or the handle of the threshold may be quite more difficult.

Windows 7 avoids writing access to the Program directory. In this case you should redirect the output of the log function to another location.(see 3.3)

5.) using rights

For none commercial using is GC3 Freeware. Commercial User can be get a license and can ask for more detailed possibility to monitor the signal strength of the detected radiation or can ask for the program sources.

6.) thanks to

... Burkhard's fine webpage. A lot of interesting projects i have found there.
My thanks goes also to Borland and their fine compiler environment.

planed options

- install a threshold for cpm that is start a information process (for example send a mail)

You have any ideas? So please send me a mail.

Version history:

V 1.3

- add more space on the left program site, some users inform me that some components be covered by the left edge
- add some batch scripts, some user have problems to work with command line arguments

- add a visible fft hires mode to learn more about the pulse length, be carefully it needs more cpu and graphic power and a bit more screen resolution (see 3.8)

V 1.4

- correct problems with the chosen windows design
- correct labeling error in hires mode and the description in this manual
- set initial size of hires mode to a clearly laid out look