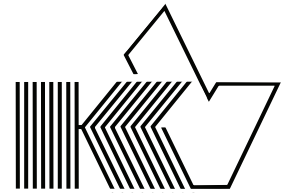


# SSF BAT 2

## Ultrasonic detector



### Characteristics

- 2 parallel working ways of detection
  1. manually operated: mixer mode (Heterodyne)
  2. automatically operated: scanner with frequency indicator and spectrogram of bat calls (frequency deviator) – so no bat call gets lost anymore!
- Applicable for expert as well as for beginners
- Frequency range 15 kHz to 130 kHz infinitely adjustable in steps of 1 kHz
- Continuous display of maximum values while scanning, ideal for easy bat detection
- Up to 4 fixed frequency programmable for fast accessing of known bat species
- Easy to handle, adjustments are saved
- Very good sensibility, because of special ultrasonic microphone in combination with a high quality pre-amplifier stage
- High quality of sound and volume, brilliant clear and differentiated transfer of bat call through integrated 1,5 W speaker
- Modern microprocessor technology, LCD with adjustable backlight (which can be switched off)
- Auto shut-off for battery protection (adjustable from 1 min to  $\infty$ )
- Optimally suitable for use in eavesdrop boxes
- Indication of status of battery charge
- 3,5 mm earphone jack plug



### Technical details

- power supply: 4x AA Mignon alkaline battery or rechargeable NiMH battery
- battery life according to mode of operation up to 40 hours
- power consumption ca. 30 mA
- weight including battery ca. 230 g
- dimensions ca. length=185mm, width=65 mm, height=28 mm

---

## Disposal of electrical and electronic products

The implementation of European law in national laws and directives obliges you to dispose of consumable goods appropriately. This serves to protect both persons and the environment.

Batteries, electrical and electronic products no longer required must be disposed of separate from domestic waste. For proper treatment, recovery and recycling of old products and used batteries, please take them to a suitable collection point provided by public waste authorities, in accordance with your national legislation and the directive 2002/96/EC and 2006/66/EC.

For more information about collection and recycling of old products and batteries please contact your local municipality or your waste disposal service. Alternatively you can send your old SSF2 detector via sufficient stamped mail back to:

BUND Naturschutzzentrum Westlicher Hegau  
Erwin-Dietrich-Str. 3  
D-78244 Gottmadingen

Information on disposal in other countries outside the European Union: If you wish to discard your SSF2 detector please contact your local authorities and ask for the correct method of disposal.



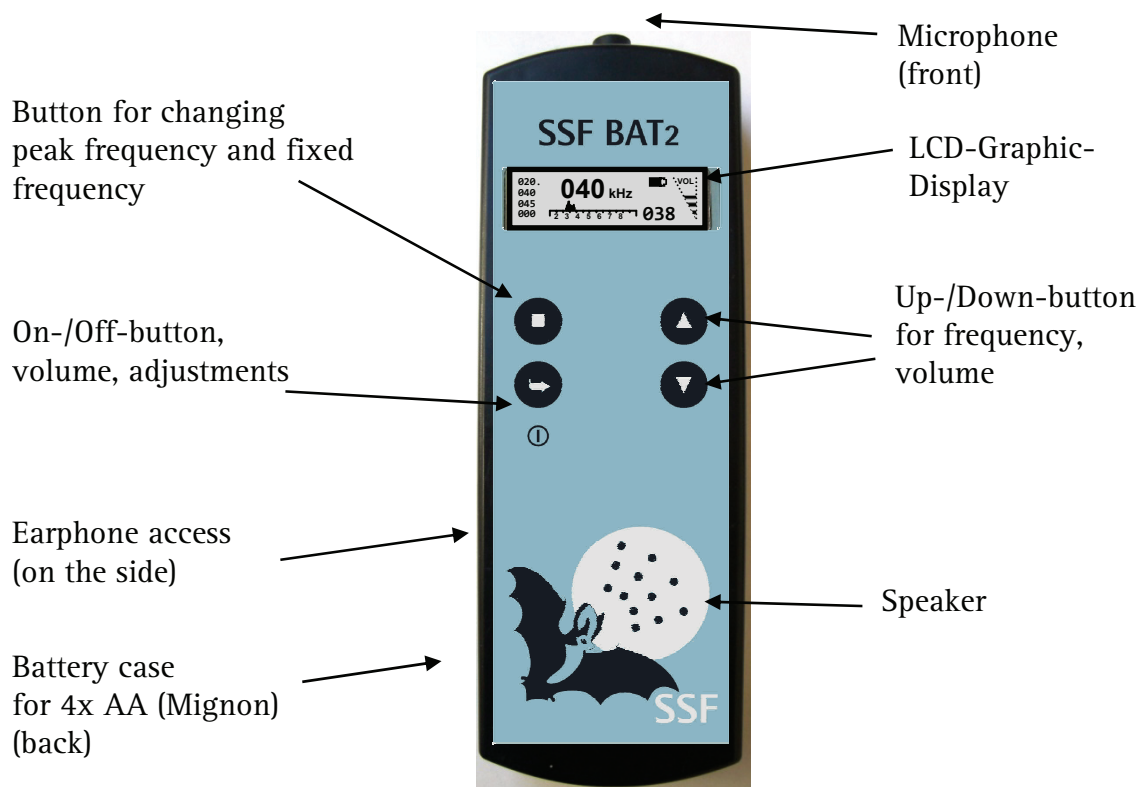
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# 1. Technical manual



## Earphone access

3,5 mm stereo- jack plug on the side. Please do not use mono jack! Speaker switches off automatically while using the earphone.

## Batteries

Device will not be delivered with batteries.

4 alkaline- type mignon (AA) or rechargeable batteries (NiMH) are needed for use. Please use only leakage free batteries.

The battery case is located on the back. Please unbolt for opening. Please pay attention to correct insertion of batteries.

Please remove batteries while not using device for a long period (several months).

Please pay attention to the hints of the Battery regulation on the last page of this manual.



## 2. Quick guide

### Adjustments- and On-/Off-button



Device is switched off:

short push → device is switched on

Device is switched on:

(Also see chapter „4. Settings“ on page 8)

1x short push	→ menu Volume (volume)
2x short push	→ menu Store (frequency save/delete)
3x short push	→ menu Light (LCD backlight)
4x short push	→ menu Off (automatic shutoff)
Long push (2 sec.)	→ switch off device

### Up-/Down-button



Normal-mode:

Short push	→ mixer frequency +/- 1 kHz
Long push	→ mixer frequency fast run

Programmer-mode:

Volume	→ volume +/- 1
Store	→ mixer frequency +/- 1 kHz
Light	→ backlight 3 levels and switch off
Off	→ time for automatic switch off 1 min. to ∞

### Frequency-button



Normal-mode:

Short push	→ take scanner frequency for mixer
Long push	→ take fixed frequency for mixer

Programmer-mode Store:



Short push	→ select storage space
Long push	→ storage of indicated mixer frequency
Long push 4 sec.	→ deletion of stored frequency



### 3. Handling


#### Switch On/Off

##### Switch-On

Press adjustments- and On-/Off-button , and afterwards UP button  within 1 sec., otherwise device automatically switches off. This procedure serves to avoid an accidental switch on of the device e. g, in a bag. After switching on device is ready for use.



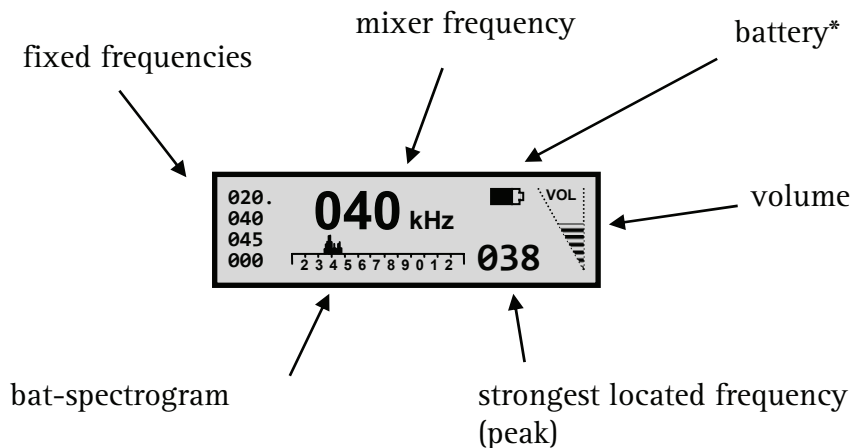
##### Switch-Off

For switch-off press adjustments- and On-/Off-button  for more than 2 sec.



Furthermore if device is switched on and not used within a certain time, device switches off automatically for protection of batteries. Default time is 5 minutes. (See programming „Off“ on page 9).


#### Default display after switch on



\* Display shows 4 level of charge state.





## Volume setting

Short push of adjustments- and On-/Off-button  switches on the mode "Volume" in which you can adjust the volume. This function ends automatically after 5 sec. with no push.



Adjust the volume by pressing the  and  button (16 stages). Graphic on the right side of the LCD shows the current stage.


## Adjustment of mixer frequency

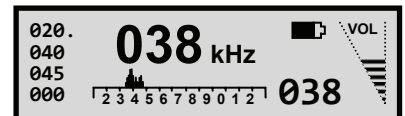
Use Up-/Down-button  and  in normal-mode for adjustment of mixer frequency for Heterodyne-receiver. With every push frequency changes by +/- 1 kHz, while a longer push switches to fast run. Frequency, resulting of mix of ultrasonic frequency and appointed mixer-frequency, will be transmitted via speaker (or headphones).

Adjustment of frequency is continuously variable from 15 kHz to 130 kHz.


## Use of frequency division & heterodyne

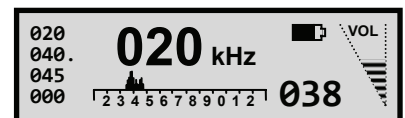
Parallel to mixer-mode the SSF BAT2 is also scanning the whole spectrum for ultrasonic frequencies using frequency division. The located frequency will be displayed in a graphic. At the same time, strongest located frequency will be displayed on the right (peak-frequency).

Through short push of frequency-button  this located peak-frequency will be taken as mixer frequency and hearable.



## Use of fixed frequencies

Through long push of frequency-button  one of the programmed and stored fixed frequencies will be taken as mixer-frequency using the heterodyne-receiver.




Dot to the right of the fixed frequency shows frequency which will be taken next. While pushing dot always jumps to the next stored frequency. Storage space not used (display: „000“) will be skipped.

3 frequencies are programmed as a default setting:  
20 kHz, 40 kHz und 45 kHz

Fourth storage space is left empty. See chapter „Store“ at the end of this page for more information about programming of fixed frequency.



## 4. Settings



Short push of adjustments- and On-/Off-button  switches through different adjustments and programming functions:

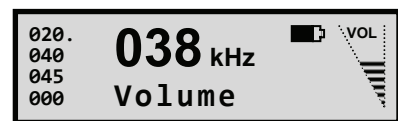
Volume, Store, Light, Off.

Function ends automatically after 5 sec. with no input.  
(Exception: „Store“ – ends after 10 sec.)

SSF BAT2 saves settings after switch off.

### Volume

Arrow keys  and  adjust volume in 16 stages.  
See also description on page 7.




### Store (save/delete of fixed frequency)

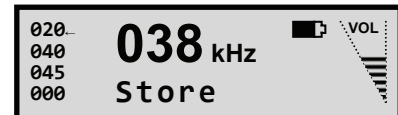
On the left side of the display you see the programmed fixed frequency in a column. There are 4 storage spaces available for fixed frequencies.

3 default frequencies are stored already. One empty storage space is displayed as „000“.



#### Selection of storage space

While you are in the Store-menu, selection of storage space is possible through short push of button .

A „←“ show the current storage space.




#### Adjustment of frequency

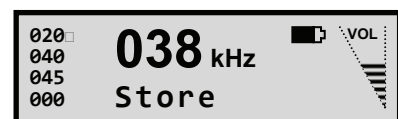
Adjustment of frequency that should be stored is now possible through pushing arrow keys  and .

#### Saving of frequency

Through long push on button  current visible mixer-frequency will be saved.

#### Deleting of frequency

For deleting of storage space press button  for 4 sec.  
As a warning of the coming deletion, after 3 sec., „←“ symbol changes into „\*“. Deletion is completed when display shows „000“.





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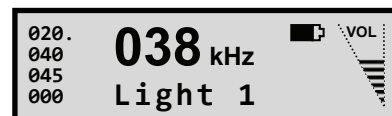
*Note:*  
*Only 3 frequencies can be deleted.*

## Light (backlight of the display)

Use the arrow keys  and  for adjustment of LCD-backlight in 4 levels.



At level 0 backlight is switched off.

*Note:*  
*Less backlight is good for a longer battery lifetime.*



## Off (auto switch off)

This function is for automatic switch off of device.

Use the arrow keys  and  for switching through different options for the auto switch off time:

1, 5, 10, 30 minutes,  
1, 4, 6, 12, 24 hours



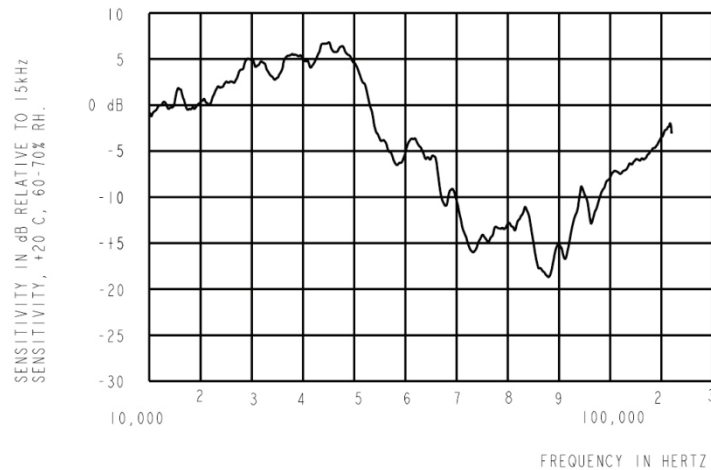
Beside that there is the opportunity of choosing „∞“. With that function device will not be switched off automatically. In combination with a sound recorder you can easily build a simple eavesdrop box that can be left out overnight.



## 5. Supplement

### Technical specifications

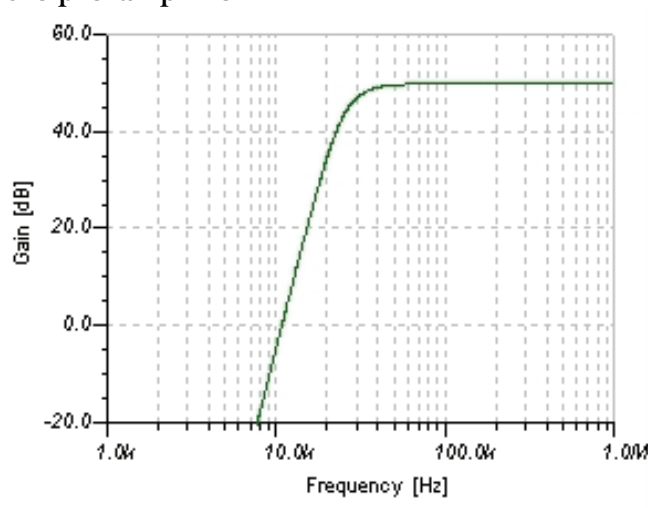
#### Microphone-frequency range



The graph shows the sensitivity of the built-in ultrasound microphone in the range of interest for bat calls. Maximum sensitivity is around 50 kHz.

The maximum sensitivity of the elektret-microphones normally used in more simple detectors is from 15 to 20 kHz.

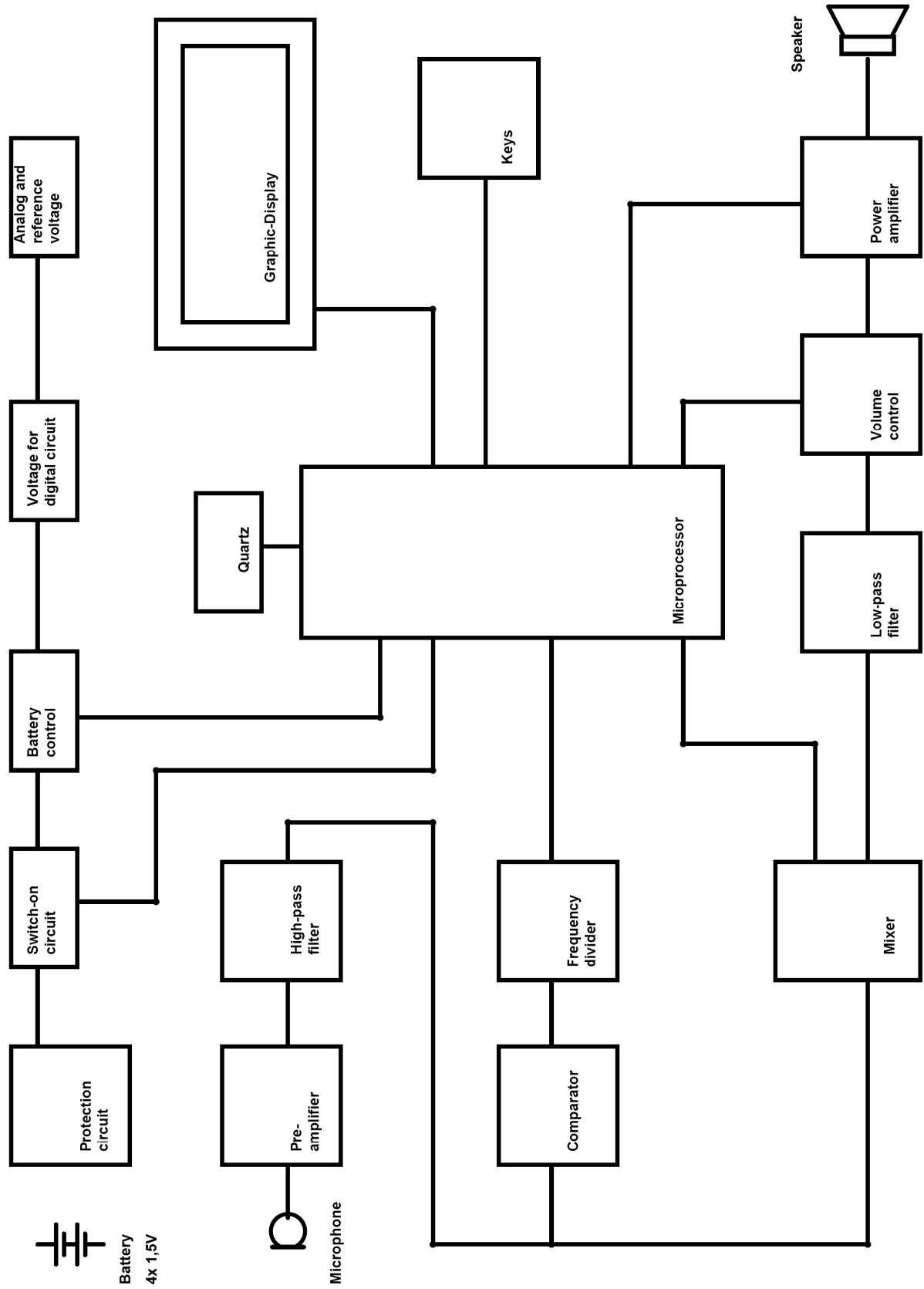
#### Frequency response of the pre-amplifier



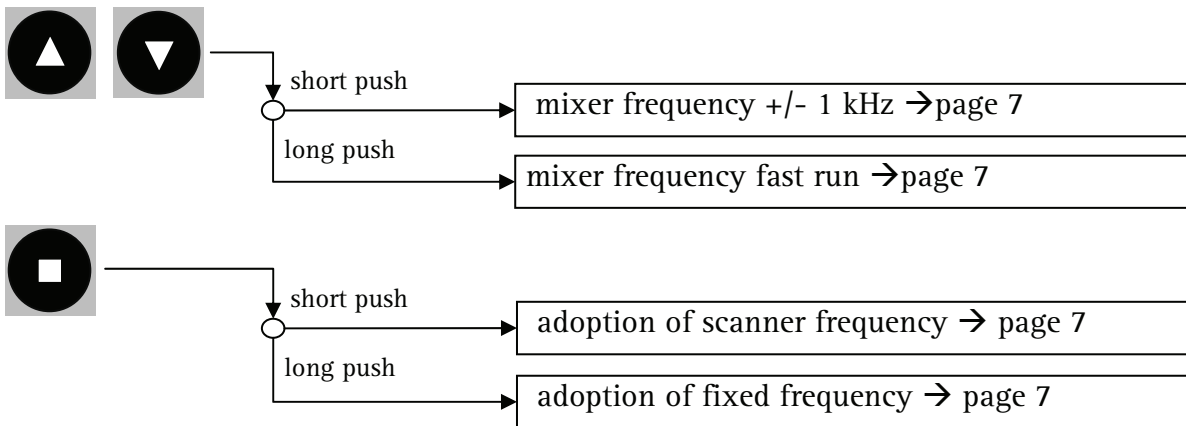
The pre-amplifier is optimised for the amplification of ultrasound signals over 15 kHz. Background noise, that could lead to overmodulation of the sensitive pre-amplifier will be masked out.



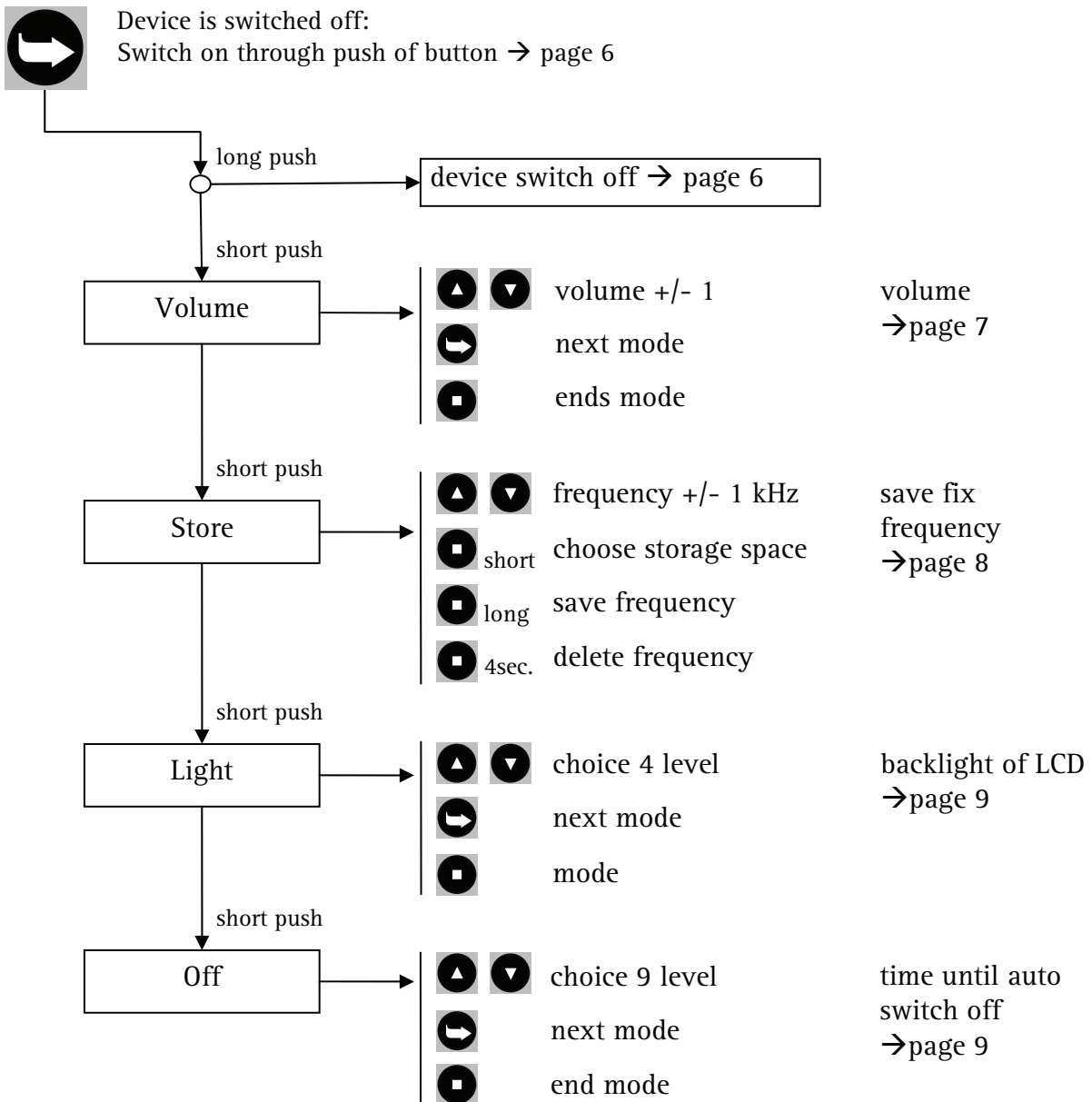
# Block diagram



# Overview of operation



## Settings



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## Development of SSF BAT2

A special thanks goes to all the people who helped with time, input and testing.  
(in alphabetical order)

Ulrike Binkle (without her the project would have been impossible)

Dr. Wolfgang Fiedler (Vogelwarte Radolfzell)

Dr. Michael Klinger (BUND)

Hubert Kraettli (SSF)

Christian Lichtenau (translation)

Kyra von Lienen (proofreading)

Dr. Hans-Peter Stutz (SSF)

Yvonne Volkmann (Design)

Attendee of civilian service: Lisa, Sarah, Kilian (Beta-Test)

and all the helpers not mentioned ...

Dipl.Ing. Karl Volkmann

Ing.büro Volkmann



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**Place for your notices**



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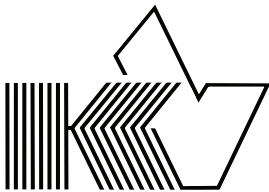
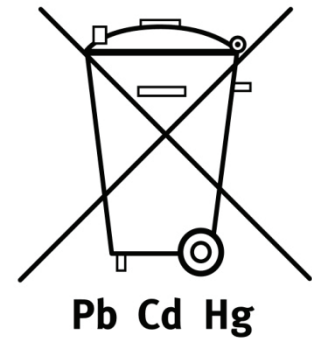
**Place for your notices**



## Battery Regulation

In connection with the sale of devices that need batteries or rechargeable batteries, we are obliged to give you the following information: The new regulation obliges battery manufacturers and importers to take back, sort and dispose of all old batteries. The consumer is obliged to give back used batteries in retail stores or in municipal collection points. You can send batteries via sufficient stamped mail back to the retail store.

Batteries, which contain pollutants, are marked with the symbol of a crossed-out dustbin, similar to the symbol in the illustration. The chemical description of the pollutant is situated below the symbol of the dustbin. "Cd" stands for Cadmium, "Pb" for Lead, "Hg" for Mercury.



Information in this manual is subject to technical changes.

Print Nr. IBV 1210 P002

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