

**Brain-Boy®**  
Main Manual



*Medi*  **TECH**  
Electronic GmbH







Product Overview

The proven concept behind the *Brain-Boy*® is to test and train the complicated elements of brainwork playfully. These instructions shall help you to use the device just as playfully.

**1.2 Product Overview**

The following graphic shows all elements of the *Brain-Boy*® you need to play with it. Take your device into your hand and compare the elements.



The three buttons are used to operate a menu which offers you eight different games.

**1.3 Purpose**

With the *Brain-Boy*® various elements of central processing and perception are trained in the human brain.

**Users:** Users are adults and children from the age of five - initially under the supervision of adults who can be instructed by the children.

**Contraindication:** The degree of protection of this product corresponds to the degree of protection of users of IT devices according to IEC 60950. The *Brain-Boy*® is not suitable for users with special need for protection, such as those with severe movement impairments.

**6.3 Short manual for each exercise:**

1. Insert headphone plug and put them on. (print at the left ear)
2. Start device with **Start**-button (if it is not on).
3. Choose exercise.
4. Choose level.
5. Pay attention to the signs (audio / visuel) and press corresponding key.

**Procedure**

Exercise	Standard version			slow version				
	0	1	2	3	0	1	2	3
A: BrainB-v	400 ms	200 ms	100 ms	50 ms	800 ms	400 ms	200 ms	100 ms
B: BrainB-a	400 ms	200 ms	100 ms	50 ms	800 ms	400 ms	200 ms	100 ms
C: Click-Boy	280 μs	140 μs	75 μs		560 μs	280 μs	150 μs	
D: SoundBoy	40 %	20 %	10 %		80 %	40 %	20 %	
E: Sync-Boy	900 ms	600 ms	300 ms		1800 ms	1200 ms	600 ms	
F: SpeedBoy	100 ms	60 ms			200 ms	120 ms		
G: TripIBoy	400 ms	200 ms	100 ms	50 ms	800 ms	400 ms	200 ms	100 ms
H: Long-Boy	400 ms	200 ms	100 ms	50 ms	800 ms	400 ms	200 ms	100 ms

ms = Milliseconds, μs = Microseconds,  
% = Pitch difference in percent

**Overview of exercises**

- BrainB-v/BrainB-a (A/B)...** Press key at the side where you heard / saw the **first** item.
- ClickBoy (C)** ... Press key at the side where you heard the item.
- SoundBoy (D)** ... Press key at the position you heard the lower tone: (1. ⇨ L; 2. ⇨ R).
- Sync-Boy (E)** ... Press key **synchronously** with the items at the **same** side.
- SpeedBoy (F)** ... Press key **as fast as possible** at the side you got the **lower** tone.
- TripIBoy (G)** ... Press key at the position you heard the **different** tone. (1. ⇨ L; 2. ⇨ L+R; 3. ⇨ R).
- Long-Boy (H)** ... Press key at the position you heard the **longer** tone. (1. ⇨ L; 2. ⇨ L+R; 3. ⇨ R).

## 6.2 Device and Service Warranty

By purchasing the *Brain-Boy*® from

### MediTECH Electronic GmbH - Wedemark

you have a full warranty period of 24 months from the purchasing date (batteries and any damage due to misuse excluded).

Supplementary, we offer you a hotline service for the whole period while working with our device.

This service includes:

Indications for the use of the *Brain-Boy*® with different groups of persons

Help with possible user problems / malfunctions

Answers to questions about and around the *Brain-Boy*®

You can contact the telephone hotline under

**0049 51 30 9 77 78-0**

Of course you may send us your questions as well:

via **fax:** **0049 51 30 9 77 78-22**

via **Email:** **service@meditech.de**

\* Except of disturbance of function or damages caused by improper use.

## EC - Declaration of Conformity

Please find the actual declaration of conformity at [www.ce.meditech.de](http://www.ce.meditech.de)

## 1.4 Security instructions

Any use that does not serve the intended purpose is not intended and therefore not permitted!

The health and safety of the user or third parties are not endangered if the equipment is properly installed, the instructions and maintenance instructions are followed. This means that this active medical device may be placed on the market for short-term use and put into operation.

The device complies with the CISPR 11 Class B standard.



### Attention:

Do not use the *Brain-Boy*® in rooms in which there are combustible gas mixtures of anaesthetics with air or oxygen or laughing gas. These may ignite. The magnetic field at the mains frequency should correspond to the typical values found in business and hospital environments.



### Attention:

Floors should be made of wood, concrete or ceramic tiles. If the floor is synthetic, the relative humidity must be at least 30%.



### Attention:

Only use the *Brain-Boy*® with headphones approved for use (MT-HS-16 X - or an alternative approved by MediTECH). Headphones must not come into contact with mains voltage or be plugged into a socket. Other headphones, cables or accessories may adversely affect (EMC) performance. The design complies with technical requirements. This prevents dangerous currents from entering the ear and thus an electrical shock.



### Attention:

Do not open the housing of the device without authorization! Do not repair errors and defects yourself! The device could be permanently damaged.



### Attention:

The battery compartment must not be opened by children. Replace the battery only when the device is switched off and without the headphone plug inserted. If the cables are torn, the unit may be damaged.



### Attention:

Do not use lithium-based rechargeable batteries.



### Attention:

The headphone cable must not be wrapped around the neck. Pulling the cord may cause suffocation or other serious injury.



### Attention:

Protect the device and the batteries from ultrasonic baths, strong moisture and chemical cleaning agents. The unit may be destroyed.



### Attention:

Protect the *Brain-Boy*® from rough impacts. The device could be damaged.



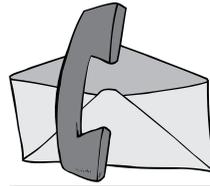
Safety Instructions



On the label this sign is blue.



On the label this sign is blue.



Contact



Safety Instructions

**Attention:**

The minimum safety distance (d [in meters]) to portable and mobile radios (mobile phone, radio headphones, transmitter / receiver, ...) including their cables:

$$d = 1.2 \sqrt{P} \text{ to } 800 \text{ MHz} / d = 2.3 \sqrt{P} \text{ from } 800 \text{ MHz to } 2.5 \text{ GHz}$$

(P = transmitter rated power in watts (W) according to transmitter manufacturer's specifications).

These could have a negative impact on the performance and safety of the device.

**Attention:**

The magnetic field at the mains frequency as well as the electromagnetic environment should correspond to the typical values found in business and hospital environments as well as in domestic health care areas. The field strength of stationary radio transmitters should be less than the compliance level at all frequencies according to a field study.

**Attention:**

Interference may occur in the vicinity of equipment bearing the adjacent symbol: Do not use the device in close proximity to other devices or with other devices in stacked form as this may cause incorrect operation.

**Attention:**

The patient operates the Brain-Boy® with or without adult assistance. The degree of protection of the device corresponds to the degree of protection of users of IT devices according to IEC 60950.

**Attention:**

Transport the Brain-Boy® only in the original packaging in which it was delivered. This ensures that the device is adequately protected against shocks during transport.

**Attention:**

Clean the Brain-Boy® before using it for the first time. Follow the instructions given in chapter 5.3 for this purpose.

**Attention:**

Excessive training may occasionally result in mild headache or dizziness. These symptoms can be corrected by a lower degree of difficulty as well as a temporary interruption of training.

**Attention:**

For medical reasons the colour RED is required for the stimulation diodes when playing with the Brain-Boy®, although according to DIN EN 60601-1 this colour is only intended for the indication of danger or urgent need for action. When using the Brain-Boy® there is no hazardous situation that should be indicated in this way.

**Attention:**

No liability is accepted for damage caused by improper handling or violation of these safety instructions.



On the label this sign is blue.

## 6. Service

In our company, customer contact and service is very important. It goes without saying that we are open for your questions and ideas concerning working with our products and their use.

### 6.1 Contact

You may contact us in different ways:

#### MedTECH Electronic GmbH

-Customer Service-

Langer Acker 7

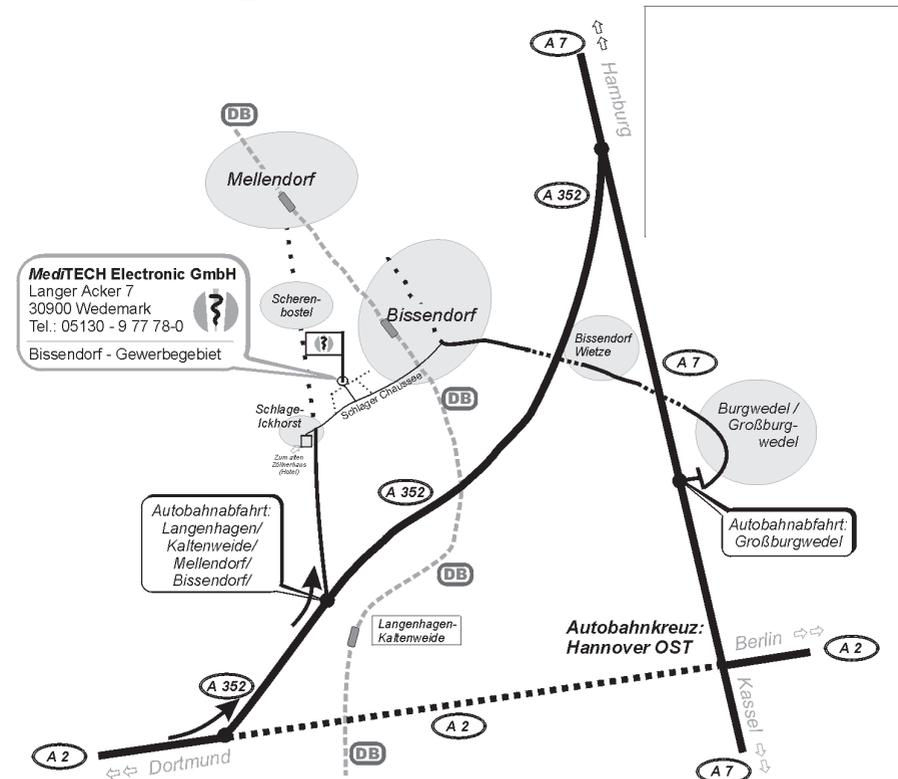
D-30900 Wedemark (Germany)

Telefon: 0049 51 30 9 77 78-0

Fax: 0049 5130 9 77 78-22

Email: [service@meditech.de](mailto:service@meditech.de)

PLEASE CHECK  
[www.meditech.de](http://www.meditech.de)  
OUR WEBSITE



Recommended separation distances for portable and mobile RF communication equipment and the <i>Brain-Boy</i>			
The <i>Brain-Boy</i> is intended for the use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or user of the <i>Brain-Boy</i> can help to prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communication equipment (transmitters) and the <i>Brain-Boy</i> as recommended below, according to the maximum output power of the communications equipment.			
Rate maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 3,5/3 \sqrt{P}$	80 MHz to 800 MHz $d = 3,5/3 \sqrt{P}$	800 MHz to 2,5 GHz $d = 7/3 \sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,37	0,37	0,74
1	1,17	1,17	2,33
10	3,69	3,69	7,38
100	11,67	11,67	23,33

For transmitters rated at a maximum output power not listed above, the recommended separation distance  $d$  in meters (m) can be determined using the equation applicable to the frequency of the transmitter, where  $P$  is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: At 80 MHz and 800 MHz the higher frequency range applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

## 1.5 General Training Information

The principal item of the *Brain-Boy*® is the menu with six independent games:

In each game you will hear clicks or tones over a headphone and/or see the flash of the LEDs. You have to react differently to these stimuli. Your answers will give information about:

- the temporal interval between stimuli which you recognize
- the pitch interval between tones you can distinguish
- time sequences which you can follow

### Recommendations:

During the first three to four weeks the trainer should press the corresponding buttons for the trainee. This ensures that the trainee is not distracted by the additional task of entering his/her answers into the device. The two functions "Sync-Boy" and "SpeedBoy" cannot be handled in this way as they measure motorical capabilities of the individual trainee.

You can slow down the *Brain-Boy*®. Press the buttons for a longer time. The next items will be provided not before you release the buttons again. This helps to make the training much stressless and calm.

If you are interested in further information about central perception the following books will allow you an extensive overview.

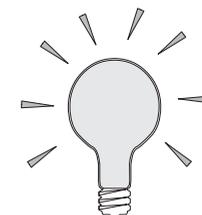
-  "Was Händchen nicht hört..." (GERMAN) by Fred Warnke
-  "Der Takt des Gehirns" (GERMAN) by Fred Warnke

These books can normally be bought at your local book store as well as directly at *MediTECH* Electronic GmbH. In addition to specialized literature, *MediTECH* offers a two-day-seminar for beginners and a follow-up workshop with the aim to achieve practical knowledge of how to use the devices and methods.

## 1.6 Supplied Accessories

The scope of delivery contains:

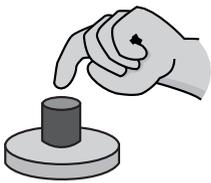
- *Brain-Boy*® with 9V battery.
- *MediTECH*-headphones MT-HS-16-X - suitable for training
-  **Attention:** The *Brain-Boy*® is only to be used with the delivered MT-headphone or an identically constructed one, supplied by *MediTECH*.
- Main Manual



In general

Recommended strategy:

1. Train combined with auditory and visual stimuli (left headphone socket)
  2. Continue with a plain auditory reinforcement run (right headphone socket)
- Handle each training function correspondingly, possibly on a daily basis.



Start

## 2. Getting started

In this chapter we will explain the steps you should carry out and pay attention to before you begin to play.

**Switch on ⇒ Choose ⇒ Go!**

This general process is valid for any of the games.

1. Switch the device on.
2. Choose a game and decide upon the difficulty level.
3. Start the Game.

To train, you should always be concentrated and relaxed. Make sure that you can practice in a quiet room, where background noises can be avoided. When using the headphones, make sure you put them on correspondingly to the description of the headphone. The side with the sticker has to be on your left ear.



When looking at the light signs while playing, please look at the circle above the start button.

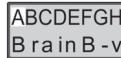


### 2.1 Program start

Press the start Button in the middle of the device and hold it for about 3 seconds. The display shows the following:



This is how you start the program. If you let go of the button, you already "are" in the game selection area. The display shows the following:



**Suggestion:** In order to get acquainted with the device, we recommend to only use the *Brain-Boy*® as described on the following pages.

In a submenu you can adjust individual settings, ie. Volume, verbal instructions and commandments (on/off), personal greeting of the trainee.

If you wish to adjust these settings, please continue in chapter 4. There you can learn about the corresponding steps. To keep usage of the *Brain-Boy*® extremely simple, there are no further comments on these extensive additional options.

Electromagnetic immunity II			
The <i>Brain-Boy</i> is intended for use in the electromagnetic environment specified below. The customer or the user of the <i>Brain-Boy</i> should assure that it is used in such environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 V eff 150 kHz to 80 MHz	3 V eff 150 kHz to 80 MHz	Portable and mobile RF communication equipment should be used no closer to any part of the <i>Brain-Boy</i> , including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m 80 MHz to 2,5 GHz	Recommended separation distance: $d = 3,5/3 \sqrt{P}$ $d = 3,5/3 \sqrt{P}$ 80 MHz to 800 MHz $d = 7/3 \sqrt{P}$ 800 MHz to 2,5 GHz
			Where P is the maximum output power rating of the transmitter in watts (W) according to the recommended separation distance in meters (m). Field strength from fixed RF transmitters, as determined by an electromagnetic site survey <sup>A</sup> , should be less than the compliance level in each frequency range <sup>B</sup> . Interference may occur in the vicinity of equipment marked with the following symbol: 

Note 1: At 80 MHz and 800 MHz the higher frequency range applies.

Note 2: These guidances may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

A Field strengths from fixed transmitters, such as base stations for radio (cellular / cordless) tele-phones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy.

To access the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the *Brain-Boy* is used exceeds the applicable RF compliance level above, the *Brain-Boy* should be observed to verify normal operation.

If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the *Brain-Boy*.

B Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 10 V/m.

Electromagnetic immunity I			
The <i>Brain-Boy</i> is intended for use in the electromagnetic environment specified below. The customer or the user of the <i>Brain-Boy</i> should assure that it is used in such environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity shall be at least 30 %.
Electrical fast transient / burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input / output lines	not applicable	Mains power quality should be similar to that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV common mode ± 2 kV differential mode	not applicable	Mains power quality should be similar to that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5 % $U_T$ (> 95 % dip of $U_T$ ) for 1/2 cycle 40 % $U_T$ (60 % dip of $U_T$ ) for 5 cycle 70 % $U_T$ (30 % dip of $U_T$ ) for 25 cycle <5 % $U_T$ (> 95 % dip of $U_T$ ) for 5 s	not applicable	Mains power quality should be similar to that of a typical commercial or hospital environment. When the user of the <i>Brain-Boy</i> continued function also calls in the event of disruption of supply, it is recommended the <i>Brain-Boy</i> form an uninterruptible power supply.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Note:  $U_T$  is the ac mains voltage prior to application of the test level.

## 2.2 End of the Program

In order to keep the *Brain-Boy*® as simple as possible, we decided to do without an off-button.

Instead, the device switches itself off automatically, therefore you do not have to do anything:

- If you do not press a button for about 40 seconds, the program will show the number 20: this number will be counted backwards to 1 before the device switches itself off.



- If you press a button within the 20 seconds, the program continues normally.

As you see, you will have enough time for your answer. You do not have to get nervous if the numbers appear suddenly in the display.

**Hint:** Read the instructions for a game completely and follow them step by step. This way you will get an extensive overview about the game and can concentrate on the game and the stimuli.

## 2.3 Program Sequence

You will find an overview of the control program on the folded rear cover page. As the program is exactly explained on the following pages, you can use this overview for orientation. Simply open the back of the cover and compare the already described parts:

- The first column shows all the games in a certain order. You can choose them with the gray buttons.

The second column shows how many difficulty levels are available for each game. The numbers tell the starting value for the task. A low difficulty level means an easy starting value for the task. You choose these as well with the gray buttons. It will be shown which part of the program you are currently in by giving a small overview on the following pages at the side.

- In addition, the possible difficulty levels and the possible start value are shown on the right sides of the game descriptions.

**Hint: Two different device variations available:**

- **2222: Brain-Boy® Universal standard** (8 exercises)
- **2226: Brain-Boy® Universal slow** (8 exercises)

Usage is identical - difference are just the start values.



Sequence



Desired Game Choice

**2.4 Desired Game Choice**

To choose a game, the *Brain-Boy*® has to be switched on.

1. Press the start button in the center of the device. Like this, you can start selecting the desired game. You can see the following in the display:



Each letter in the top line of the display stands for a different game. The blinking frame shows the actual choice. The lower line shows the name of the chosen game, in this case it is **Brain-Boy**.

If the headphones are plugged in and you have put them on, the names of the games will be announced for you.

*Would you like to start at once?*

2. Press the start button and continue with the next chapter (difficulty level).

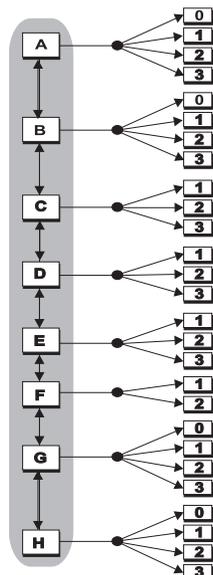
*Or would you like to try another game?*

1. Mark a different game with the buttons on the left or on the right: (Have a look at the table)
  - Press the button **L**. The blinking frame goes one position to the **left**.
  - Press the button **R**. The blinking frame goes one place to the **right**.

Letter	Game
A	BrainB-v
B	BrainB-a
C	ClickBoy
D	SoundBoy
E	Sync-Boy
F	SpeedBoy
G	Trip!Boy
H	Long-Boy

2. Press the buttons L / R as often as needed until you have marked the desired game.
3. Press the start button. Like this you choose the game and can now fix the difficulty level. (Look at the following chapter difficulty level)

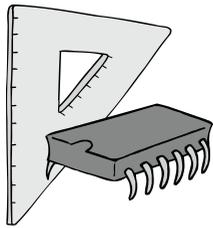
**General hint:** Hold the *Brain-Boy*® in such a way, that you can use the buttons L / R with two fingers. This will make operation easier.



**6.8 Electromagnetic compatibility – Guidance and manufacturer’s declaration**

Electromagnetic compatibility
DIN EN 60601-1-2:2011 (IEC 60601-1-2:2011)
Medical electrical devices are subject to special precautionary measures in particular regarding the EMC with the installation and the operation.
Portable and mobile HF-communication devices e.g. mobile phone can affect medical electrical devices.
A use of other accessories and lines than the indicated, can lead to an increased sending or a reduced noise immunity of the equipment. The equipment has to be operated exclusively with original accessories.
The device should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the device should be observed to verify normal operation in the configuration in which it will be used.

Electromagnetic emissions		
<i>Brain-Boy</i> is intended for use in the electromagnetic environment specified below. The customer or the user of the <i>Brain-Boy</i> should assure that it is used in such environment.		
Emission test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The <i>Brain-Boy</i> uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The <i>Brain-Boy</i> is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	not applicable	
Voltage fluctuations / flicker emissions IEC 61000-3-3	not applicable	



Technique

### 5.7 Model identification plate

At the back of the *Brain-Boy*® the following model identification plate is placed. The details and signs have the following meaning:

Attention, read and understand users manual!

**Hint:** Sign is blue at the device

Producer and year of production

Type

Article number (see below)

Serial number

Appliance part BF (device and headphones)

Environmental-disposal-classification

Achtung: Ausschließlich den Kopfhörer MT HS-16 X oder eine durch MedITECH genehmigte Alternative anschließen!  
9V-Blockbatterie: Vor dem Wechseln Gebrauchsanweisung beachten!

**MediTECH**  
Electronic GmbH

D-30900 Wedemark  
Tel.: +49-(0)5130-97778-0  
Fax: +49-(0)5130-97778-22

**BrainBoy**®

REF  2222 /  2226

SN

0633  
**Made in Germany**

Notified body according to medical device directives w- can be identified at [www.ce.meditech.de](http://www.ce.meditech.de)

#### Article number: Version is marked at the device

- 2222: *Brain-Boy*® Universal **standard**
- 2226: *Brain-Boy*® Universal **slow**

#### Year of production of headphones MT-HS-16 X



Month and year of production  
Example here: May (5) 2015

### 2.5 Difficulty Level

Before you can choose the difficulty level of a game, you have to choose the specific game. For that, follow the steps in the previous chapter: Selecting the desired game.

After having chosen a game, in this example *Brain-Boy*, the display shows the following.



The top line of the display shows the name of the chosen game, the lower line shows the possible difficulty levels. The *Brain-Boy*, for example has four.

Here as well, the blinking frame shows the marked choice. The single difficulty levels have different meanings (have a look at the table):

1. Choose left or right with the buttons L / R.
  - Press the button **L**. The blinking frame goes one place to the **left**.
  - Press the button **R**. The blinking frame goes one place to the **right**.

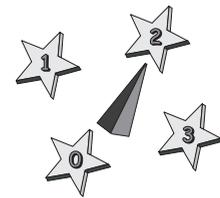
Digit	Meaning
0	very easy
1	simple
2	difficult
3	very heavy

Which difficulty level stands for which starting level, you can see on the table at the back of the cover.

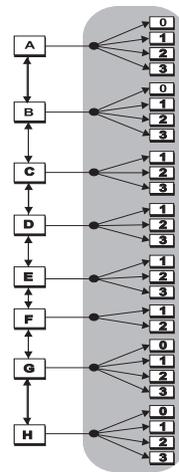
- Hint:** If you are trying a game for the first time, you should start with a lower difficulty level. The tasks within by the games will become more difficult automatically, if you give the right answer.
2. Press the buttons L / R as often as many times as needed, until you have selected the desired level.
  3. Now press the start button to confirm your choice and start the game. The first set of stimuli starts after a three second countdown once you released the button - so please be attentive.

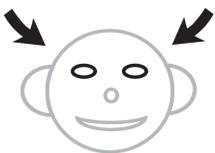
### 3. Games

On the following pages you will find specific descriptions to learn how to practice with the different functions of the *Brain-Boy*®!



Difficulty Level





BrainB-v

### 3.1 BrainB-v – Game

While playing with the Brain-B-v, you test and train the tact frequency of your brain at seeing (i.e. its processing speed) - the so called order threshold. It indicates the time measure of the ability to distinguish signals with only a brief pause interval and to put them in order. This ability is very important for digesting written information.

During the training you will perceive different stimuli:  
 -auditory order threshold: You hear two short clicks.  
 -visual order threshold: You see two short light signals.  
 -auditory and visual order threshold: You hear and see both kinds of sensual stimuli.

#### What is your training goal?

The long-term goal is to increase the speed of the brain's capability to digest and process information.

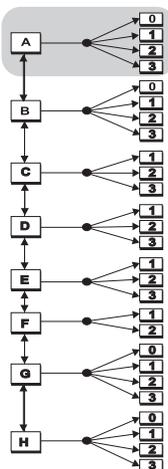
#### How do you practice?

- Put the plug of the headphones tightly into the following connecting socket.
  - visual training (with auditory help): left socket
  - visual testing: no headphones
- For training put on the headphones corresponding to the description on the headphones. The headphone side with the sticker has to be on your left ear.
- Start the game BrainBoy. Follow the instructions on page 10 and 11.
- Exactly pay attention to the clicks and/or light signals – the order is important! You have 30 seconds time to give the answer. You may calmly decide at which side you perceived the first stimulus.
- Press one of the buttons L / R depending, on which signal came first.



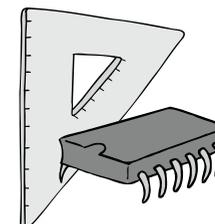
#### Recommended strategy:

- Train combined with auditory and visual stimuli (left headphone socket)
  - Continue with a plain visual reinforcement run (no headphones)
- Handle each training function correspondingly, possibly on a daily basis.



### 5.6 Technical details

tension voltage	9 V-battery or rechargeable (see attention advice below)
running	30 mA
output level	< 110 dB(A) directly at the headphones
output signal	295 - 920 Hz, variable length
ISI (Inter-Stimulus-Intervall)	18 µs - 999 ms, var. steps
measurement uncertainty	18 µs - 900 ms +/- 2%
frequency difference	1 ... 80 %, variable steps
Störspannungsabstand (typisch bei Normeinstellung)	67 dB
weight	150 g (incl. battery)
Enclosures protection class	IP 20
<b>Usage</b>	
temperatur of surrounding	+10 °C - +40 °C
rel. atmospheric humidity	30% - 75%
air pressure	700 - 1060 hPA
<b>Storage and transport</b>	
temperatur of surrounding	-20 °C bis +50 °C
rel. atmospheric humidity	20 % - 95 %
air pressure	700 - 1060 hPa
<b>Light emitting diodes</b> * at a temperatur of 25 °C	
case	2,5 mm rectangular
colour	red / green
wavelength	555 nm - 660 nm
radiate angle	60° bis 80°
tension voltage*	1,90 V / 2,20 V
maximal voltage*	2,50 V / 2,80 V
light intensity	min. 14 mcd at I <sub>F</sub> =20 mA
I <sub>F(max)</sub>	30 mA
reaction time*	20 ns



Technical Details

The device has an expected operating life of 8 years. It meets the requirements of Group 1 Class B according to CISPR 11.

The device and the headphones are BF type application parts.



**Attention:** Do not use lithium-based batteries or rechargeables.

#### MediTECH-head phones MT-HS-16 X

impedance	32 Ohm ± 2%
response	20 - 20.000 Hz
power	max 100 mW
lead	1.80 m shielded
plug	3,5 mm stereo phone jack
weight	75,5 g



Technique

### 5.3 Cleaning

Disinfect the device and headphones after use and before use by another person.

Patients with a commercially available mild disinfectant z. B. antifecht N liquid (manufacturer: Schülke)

**Attention:** It is imperative that you observe the operating and safety instructions of the respective manufacturer of the agent / cloth. Improper use may result in damage to health or equipment.

**Attention:** Protect the device from ultrasonic baths, running water and chemical cleaners such as thinner and alcohol. The unit could be damaged.

**Note:** Headphone pads should be replaced at regular intervals, at least every six weeks. This will prevent increasing contamination and toxicity.

The foam material parts of the headphone have to be replaced when the user changes. Cleaning the foam material is not envisaged. You can purchase the upholstery in a specialised shop or at the *MediTECH* (product number 8333).

### 5.4 Storage

After 60 seconds of non usage, the *Brain-Boy*® completes an automatic shutdown.

- Store your device in a dry and closed-off room at typical room temperature. You can place it in a permanent wall attachment which you may purchase from *MediTECH* (part number 9060)
- For longer periods of storage or transportation use the original packaging the *Brain-Boy* comes with.

Note: After storage of the device in the upper or lower temperature range of the storage conditions, please wait approx. 15 minutes until the device has again adapted to the normal operating conditions.

### 5.5 Sewage and Refuse Disposal

The *Brain-Boy*® and its components are categorized as small battery-run electronic devices.

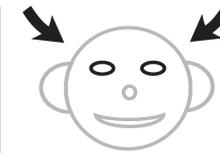
- Remove the battery from the battery department and dispose of it in the next available collection site (usually provided by your regional administration)
- As available domestically: Return your *Brain-Boy*® and the corresponding headphones to your local waste disposal. Category: Small electronic devices
- The package of this device to 100 percent consists of cardboard; therefore it can be disposed of as paper waste.

If you do not wish to simply dispose of the *Brain-Boy*®, we will be more than happy to receive it back from you. We will dispose your unit in a sound and environment fashion.



Did you see the first light at the **left side**? Then press the button **L**.

Did you see the first light at the **right side**? Then press the button **R**.



BrainB-v

If you answer correctly, the device will praise you and increase the difficulty level for the next pair of stimuli. The two stimuli will follow each other more quickly each time, so please pay attention!

If your answer was incorrect, you can try again on a lower difficulty level. The stimuli will follow each other more slowly.

In the topline the display the order threshold value you have reached is shown, then it changes to the next value. And you already see and/or hear the pair of stimuli.

30 ms  
Great

### End of Training

#### a. Early Program Termination

You may terminate the training any time and return to the next menu step.

- Keep the start button pressed for at least one second. This will interrupt the training and return you to the main menu. Prior to that your achieved score will be shown as your "endscore".

#### b. Automatic Program Termination

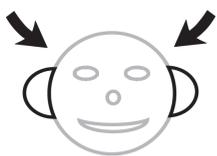
If you make three mistakes in a sequence of seven pairs of stimuli, the device terminates the program on its own. The display will show the accomplished value before the first wrong answer as the top value.

- Write this result into a copy of the result table on page 42. Compare your results to the table file on page 28.

Furthermore, the device finishes the game automatically if: You fall short of 5 ms or exceed 800 ms. That is when you have reached one of the program boundaries The display shows the words endvalue or topscore. After 30 seconds the game selection becomes available again. You can speed up returning to the main menu by pressing the start button.

Startvalue of level

level	standard version	slow version
0	400 ms	800 ms
1	200 ms	400 ms
2	100 ms	200 ms
3	50 ms	100 ms



BrainB-a

### 3.2 BrainB-a – Game

While playing the BrainB-a you test and train the tact frequency of your brain at hearing (i.e. its processing speed) - the so called order threshold. It indicates the time measure of the ability to distinguish signals with only a brief pause interval and to put them in order. This ability is very important for spoken language information.

During the training you will perceive different stimuli:  
 -auditory order threshold: You hear two short clicks.  
 -auditory and visual order threshold: You hear and see both kinds of sensual stimuli.

**Recommended strategy:**

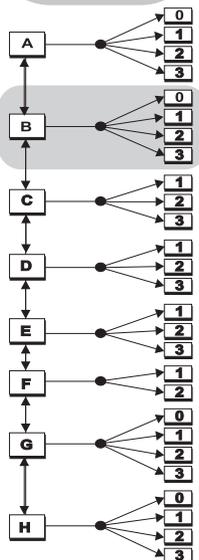
1. Train combined with auditory and visual stimuli (left headphone socket)
  2. Continue with a plain auditory reinforcement run (right headphone socket)
- Handle each training function correspondingly, possibly on a daily basis.

**What is your training goal?**

The long-term goal is to increase the speed of the brain's capability to digest and process information.

**How do you practice?**

1. Put the plug of the headphones tightly into one of the two connecting sockets.
  - auditory training (with visual help): left socket
  - auditory testing: right socket
2. For test and training put on the headphones corresponding to the description on the headphones. The headphone side with the sticker has to be on your left ear.
3. Start the game BrainBoy. Follow the instructions on page 10 and 11.
4. Exactly pay attention to the clicks and/or light signals – the order is important! You have 30 seconds time to give the answer. You may calmly decide at which side you perceived the first stimulus.
5. Press one of the buttons L / R depending, on which signal came first.



### 5.2 Battery Change

The Brain-Boy® is delivered with an inserted and connected battery. This has to be changed after a few month of daily practice if:

- the volume of the clicks and the text is softer
- the details on the display are more difficult to see

You need a leak proof 9 V battery which you can purchase in any electronic department of a store.

**Attention:**  
 Do not use lithium-based batteries or rechargeables.

The battery case is at the back of the case.

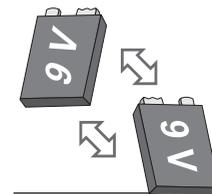
1. Turn the device so that you can well reach the back side. Look out that the connecting sockets of the headphone do not point toward your body.
2. Open the lock of the lid. Pull the slide into your direction.
3. Remove the lid. You can now see the battery.
4. Carefully take the battery out of the battery case.

**Attention:** Do not tear at the wires. You may damage the device.

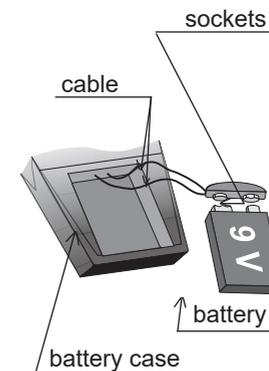
5. Unbutton the old battery of the connections.
6. Button the new battery onto the connection. Pay attention that the connections are inserted firmly.
7. Put the battery carefully into the battery case.

**Attention:** Pay attention that the wires are completely inside the battery case. They must not loom about the rand, otherwise, they could be jamed.

8. Put the lid onto the battery chamber.
9. Shove the slide away from you. Doing so you close the case.



Battery Change





## 5. Maintenance and Technique

In this chapter you will learn how to deal with possible difficulties with the device.

### 5.1 Trouble Shooting

Trouble Shooting

Problem	Check this
You cannot hear the <b>sounds at all</b> or <b>only at one side</b> .	<i>The headphone might not be connected correctly.</i> Check if the headphones plug has been inserted firmly. <i>The headphone might be defective.</i> Please contact us because you are only allowed to replace the headphone by an approved one.
The <b>stimuli</b> and the <b>text</b> are <b>weaker</b> to hear than usual. The <b>display</b> is only showing <b>weakly</b> .	<i>The battery might be empty.</i> Change these by following the instructions in the chapter battery change. <i>This maintenance work must not be done by children!</i>
The device switches itself off automatically and shows the top value.	You made three mistakes during the last seven stimuli. This performance is intended to get a reliable test result.
<b>Apparently</b> you pressed the <b>right button</b> . But nevertheless no praise is given and the tasks get easier (higher values)	The headphone might be used the wrong way round. Turn it as described and continue the game. The side with the sticker has to be on your left ear.
During the game, the current values do not appear on the display; no praises are displayed or presented in the headphones.	These functions (some or all) were turned off. Simply turn them back on as needed (see pages 32/33 for reference).
Only game functions BrainB-v, BrainB-a and SoundBoy are available.	You own a Brain-Boy Classic version. You may upgrade your device to a Universal version. Please contact MediTECH support for details.

Are there other mistakes or problems while playing?

Contact our customer hotline

+49 - 5130 - 9 77 78-0.

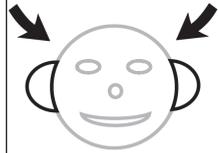


We can discuss further steps together!



Did the first click come from the **left**?  
Then press the button **L**.

Did the first click come from the **right**?  
Then press the button **R**.



BrainB-a

If you answer correctly, the device will praise you and increase the difficulty level for the next pair of stimuli. The two stimuli will follow each other more quickly each time, so please pay attention!

30 ms  
Great

If your answer was incorrect, you can try again on a lower difficulty level. The stimuli will follow each other more slowly.

In the topline the display the order threshold value you have reached is shown, then it changes to the next value. And you already see and/or hear the pair of stimuli.

#### End of Training

##### a. Early Program Termination

You may terminate the training any time and return to the next menu step.

- Keep the start button pressed for at least one second. This will interrupt the training and return you to the main menu. Prior to that your achieved score will be shown as your "endscore".

##### b. Automatic Program Termination

If you make three mistakes in a sequence of seven pairs of stimuli, the device terminates the program on its own. The display will show the accomplished value before the first wrong answer as the top value.

- Write this value into a copy of the result table at the back of the cover. Compare your results to the table file on page 28.

Furthermore, the device finishes the game automatically if:

You fall short of 5 ms or exceed 800 ms. That is when you have reached one of the program boundaries. The display shows the words endvalue or topscore. After 30 seconds the game selection becomes available again. You can speed up returning to the main menu by pressing the start button.

Startvalue of level

level	standard version	slow version
0	400 ms	800 ms

1	200 ms	400 ms
---	--------	--------

2	100 ms	200 ms
---	--------	--------

3	50 ms	100 ms
---	-------	--------

**Functions:**

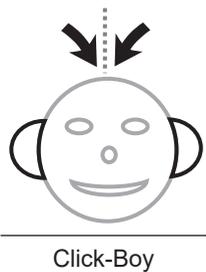
- voice
- praise
- OK-LED
- ISI
- R-L-Sync
- Speech

**Function:**

- name

**Function:**

- end



Click-Boy

### 3.3 ClickBoy – Game

While playing the ClickBoy you test and train your directional hearing. This is very important to be able to perceive directly sounds and especially language from different directions, to be able to assign them and to overhear them as well. You will hear two stimuli – really. But if you perceive only one click it is absolutely normal. The temporal interval between the stimuli is so small that you really cannot hear them. A sound in a room will be perceived temporarily separated by one’s ears. The ClickBoy simulates this situation with two stimulies. The minimal temporal difference is enough for the brain to be able to ascertain the direction the sounds came from quite exactly.

**Recommended strategy:**

1. Train combined with auditory and visual stimuli (left headphone socket)
  2. Continue with a plain auditory reinforcement run (right headphone socket)
- Handle each training function correspondingly, possibly on a daily basis.

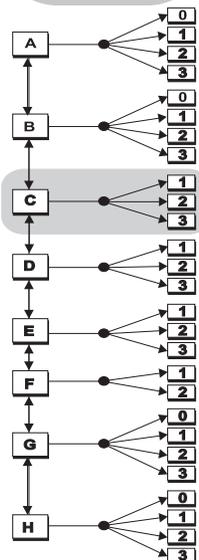
#### What is your training goal?

The aim is to be able to locate sounds as exactly as possible in the room without any visual help.

#### How do you practice?

1. Put the plug of the headphones tightly into one of the two connecting sockets.
  - auditory training (with visual help): left socket
  - auditory testing: right socket
2. For test and training put on the headphones corresponding to the description on the headphones. The headphone side with the sticker has to be on your left ear. 
3. Start the game ClickBoy. Follow the instructions on page 10 and 11.
4. Pay exactly attention to the click – the side is important! You have 30 seconds time to give the answer. You may calmly decide at which side you heard the click.

Hint: The click seems to be very near to the centre of the head – please pay attention!



#### Functions B through G: (identical usage)

Here you can choose to turn the function <on> or <off>.

- Press L or R to toggle between <on> and <off>.

#### Funktion H: Name

Here you have the following options to choose from (see table file):

Letter	Option
A	show
B	new
C	end

Press L or R to mark-up the desired option, then press Start to select it.

##### Option A: show

- Proceed as described for functions B through E (see above).

##### Option B: new

**Suggestion:** Please be attentive when entering the name. You can only scan through the alphabet from A to Z repetitively – however you cannot scroll backwards.

1. Press the R button until you see the desired letter on the display
2. Press Start to select the desired letter.
3. Continue to „write“ the name by pressing the R button as needed and confirm each selection by pressing start.
4. Press L if you chose the wrong letter. By doing so you can delete your latest entry.

##### You wish to exit the name entry option?

- Press Start 2 times quickly after another.

**Note:** If you enter a new name, this has no effect on the previously recorded training data.

##### Option C: end (of submenu)

Press start to return to the settings menu

##### Function G: end

Press Start to return to the main menu.

## 4. Individual settings

In this chapter you find explanations on the individual settings you can define for your *Brain-Boy*<sup>®</sup>:

Letter	Function	Meaning
A	volume	Change signal volume (left/right).
B	voice	Turning verbal announcements for games and praises on/of (no voice when defined „off“)
C	praise	Visual praises on correct answers (not displayed when defined „off“)
D	OK-LED	light confirming correct answers (not light when defined „off“)
E	ISI	inter stimulus interval can be read from the display (not displayed during the run when defined „off“)
F relevant just at Sync-Boy	R-L-Sync	Notice sequence of correct answers (if on: Improvement just possible after alternating insert of correct sides)
G	Speech	Change the menu language in display
H	name	Client can enter his first name (to be displayed upon starting the device. (if turned off, „Enjoy Playing“ will be shown during start.)
I	end	Command to exit the settings menu

1. Press the Start button and additionally the L button in the main menu; the display changes to: **ABCDEFGG volume**
2. You are now in the settings menu. Now release both buttons.
3. Press L or R as necessary to mark-up the desired function (see table file)
4. Press Start. This selects the marked-up function and provides you with the corresponding options.

### Function A: volume

1. Press Start and put on the headphones correctly. You will hear a beeping sound on the left.
2. Adjust the volume as necessary.
  - Press R to increase the volume.
  - Press L to reduce the volume.
  - Press Start to confirm the settings you defined.
3. Repeat the same process for the right ear.

If the volume settings exceed the norm volume, a warning will show on the display. Press Start to acknowledge this warning. This is to protect you from accidentally being exposed to overly loud volumes.

5. Press one of the buttons L / R correspondingly to the side where you perceived the click signal.



Did the click come from the **left**?  
Then press the button **L**.



Did the click come from the **right**?  
Then press the button **R**.

If you answer correctly, the device will praise you. The following click seems to be nearer to the centre of the head. The difficulty level of the tasks increases.

55  $\mu$ s  
Super

If your answer was incorrect, you can try again at a lower difficulty level. The following click will be further away from the centre of the head.

The display shows shortly the reached temporal difference reached and continues with the following value. And you already hear the next click.

### End of training

#### a. Early Program Termination

You may terminate the training any time and return to the next menu step.

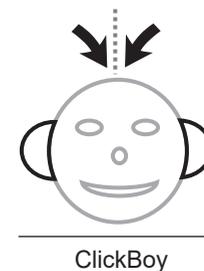
- Keep the start button pressed for at least one second. This will interrupt the training and return you to the main menu. Prior to that your achieved score will be shown as your “endscore”.

#### b. Automatic Program Termination

If you make three mistakes in a sequence of seven pairs of stimuli, the device terminates the program on its own. The display will show the accomplished value before the first wrong answer as the top value.

- Write this result into a copy of the result table on page 42. Compare your results to the table file on page 28.

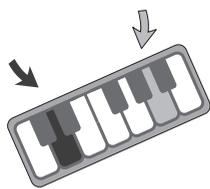
Furthermore, the device finishes the game automatically if: You fall short of 18  $\mu$ s or exceed 600  $\mu$ s. That is when you have reached one of the program boundaries. The display shows the words endvalue or topscore. After 30 seconds the game selection becomes available again. You can speed up returning to the main menu by pressing the start button.



ClickBoy

Startvalue of level

level	standard version	slow version
1	280 $\mu$ s	560 $\mu$ s
2	140 $\mu$ s	280 $\mu$ s
3	75 $\mu$ s	150 $\mu$ s

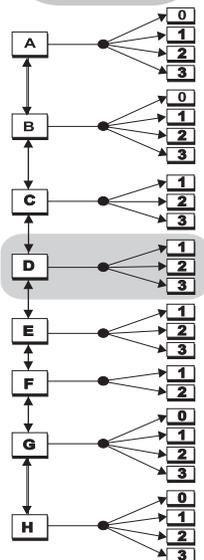


SoundBoy

#### Recommended strategy:

1. Train combined with auditory and visual stimuli (left headphone socket)
2. Continue with a plain auditory reinforcement run (right headphone socket)

Handle each training function correspondingly, possibly on a daily basis.



### 3.4 SoundBoy – Game

While playing with the SoundBoy you test and train the ability to distinguish between tones with very small pitch differences. This is extremely important for speaking as well as for understanding a language.

A decisive aspect of speaking is to recognise the word stress of the pronunciation. The most important prerequisite is of course to be able to recognise small tone differences.

Emphases in spoken speech transport "hidden" messages. If these messages are overheard, there does not necessarily need to be a "mean intention" behind it. Frequently, emphases are simply not perceived.

In this game you will hear two sounds which differ only in their pitch.

#### What is your training goal?

The long-term aim is to be able to distinguish between the pitch of two tones as exactly as possible.

#### How do you practice?

1. Put the plug of the headphones tightly in one of the two connecting sockets.
  - auditory training (with visual help): left socket
  - auditory testing: right socket
2. Put the headphones on.
3. Start the game SoundBoy. Follow the instructions on page 10 and 11.
4. Listen to the tones, this time, the order is important, it depends on the deeper tone!  
For the answer, you have 30 seconds time. You may think calmly which of the tones has been the deeper one.
5. Press one of the buttons L / R depending on which pitch came first:

#### Function D: progress

You are reviewing the stored data for the BrainB-v function.

##### Reviewing the development for this game function?

1. Press Start. You will see the score for this game during the last reinforcement run.
2. Press L and R until you have reviewed all data you were interested in.
3. Press Start. This will take you back to the regular main menu.

##### View the development of another game function?

1. Press L or R (as often as necessary) to choose a different game function.
2. Continue with the previously described steps.

##### Delete previous results (Reset option)

- Press L or R until the Reset option is selected. To proceed, read on at "General information on the reset function".

##### Exit submenu?

- Press L or R until you see the END command in the display. Now press start to exit the submenu and return to the main menu.

#### Function E: ResetAll

Please continue by reading on at "General information on the reset function"

#### Function F: Ende

Press Start to exit the evaluation menu.

#### General information on the reset function

When you see the reset option in the display, proceed as follows:

*If you do NOT wish to delete all recorded values:*

⇒ Press the L or R button to pass this option.

*If you DO wish to permanently delete all recorded values*

⇒ Press the start button.

In the display you see:

- Press L. This deletes all stored data.
- Press R. This terminates the process and you return to the previous menu. No data is deleted.

**resetAll**  
yes no



Evaluation menu

Function:  
• progress

Function:  
• ResetAll

Function:  
• end



Evaluation menu

### 3.10 Evaluation menu

The *Brain-Boy*® comes with a special menu for evaluation (data logging). This should not be mentioned to the individual clients using the device so that they do not overly feel controlled and do not erase the obtained data.

Within the evaluation menu, all data is stored per game function. The obtained data can be reviewed with the following menu options:

Letter	Function	Meaning
A	topscore	... out of the last 20 reinforcement runs
B	latest	... score achieved in the reinforcement mode
C	how many	... did the client use the training or the reinforcement
D	progress	Results from the last 20 reinforcement runs
E	resetAll	Delete all collected data
F	end	Leave the evaluation menu

1. Within the main menu (game selection), press the start button and additionally keep the R button pressed for approximately 5 seconds (until the following information appears in the display):



You are within the evaluation menu. Please release both buttons now.

1. Press the buttons L / R to choose the desired function.
2. Press the start button. You will select the function and reach its content.

#### Functions A through C: (identical usage)

These functions are handled identically.

You are reviewing the stored data for the BrainB-v function. If there is nothing but a horizontal bar, no sessions using the reinforcement mode were conducted / stored.

- Access the stored data for the other seven game functions by pressing the L or R button.
- Once you reach the RESET option, please continue reading at „General information on the reset function“.
- When reaching the END option, simply press Start. This will take you back to the regular main menu.

**Function:**  
 • topscore  
 • latest  
 • how many

Explanations regarding function C:  
 T0XX: number of trainings conducted  
 V0XX: number of reinforcement conducted

Was the **first** tone deeper?  
 Then press the button **L**.

Was the **second** tone deeper,  
 then press the button **R**.

If you answer correctly, the device will praise you. The interval between the two tones will become smaller. The difficulty level increases.

If your answer was incorrect, the interval will become a bit wider, you may try again at a lower difficulty level. The display shows the tone difference reached, and continues to the next value.



And you already hear the next pair of tones.

#### End of training

##### a. Early Program Termination

You may terminate the training any time and return to the next menu step.

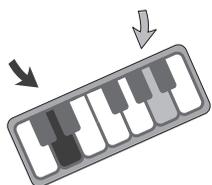
- Keep the start button pressed for at least one second. This will interrupt the training and return you to the main menu. Prior to that your achieved score will be shown as your “endscore”.

##### b. Automatic Program Termination

If you make three mistakes in a sequence of seven pairs of stimuli, the device terminates the program on its own. The display will show the accomplished value before the first wrong answer as the top value.

- Write this result into a copy of the result table on page 42. Compare your results to the table file on page 28.

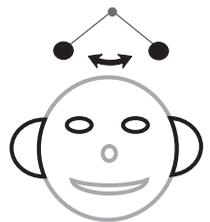
Furthermore, the device finishes the game automatically if: You fall short of 1% or exceed 65%. That is when you have reached one of the program boundaries The display shows the words endvalue or topscore. After 30 seconds the game selection becomes available again. You can speed up returning to the main menu by pressing the start button.



SoundBoy

Startvalue of level

level	standard version	slow version
1	40 %	80 %
2	20 %	40 %
3	10 %	20 %



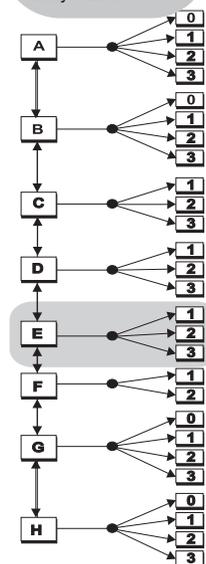
Sync-Boy

Hint:

The training with Sync-Boy should not be started before reached values corresponding to the age at BrainB-a-training

Recommended strategy:

1. Train combined with auditory and visual stimuli (left headphone socket)
  2. Continue with a plain auditory reinforcement run (right headphone socket)
- Handle each training function correspondingly, possibly on a daily basis.



### 3.5 Sync-Boy – Game

While playing the SyncBoy you test and train the ability to digest perceived stimuli and to convert them into movements as quickly as possible. Especially the temporarily assimilation of information plays a very important role for thinking, speaking and writing.

Auditory and visual information have to be perceived, to be taken apart, erranged and to be analysed by the brain. To be able to react quickly to words information, a fast temporal assimilation in the brain is extremely important.

During the training, clicks in a constant order will be offered to you: left, right, left, ...

Auditory digestion: you will hear short clicks

Visual digestion: you see short light flashes.

Auditory and visual digestion: You see and hear both stimuli.

#### What is your training goal?

The aim is to locate auditory stimuli as exactly as possible without any visual assistance.

#### How do you practice?

1. Put the plug of the headphones tightly in one of the two connecting sockets.
  - auditory training (with visual help): left socket
  - auditory testing: right socket
  - visual testing: no headphones
2. For test and training put on the headphones corresponding to the description on the headphones. The headphone side with the sticker has to be on your left ear.
3. Start the game SyncBoy. Follow the instructions on page 10 and 11.
4. Pay attention to the stimuli, the clicks and / or the light signs.

#### General Rule:

Weaker – in this case higher – values for single games are **in no case** an indication of less intelligence!

This is an important information which you should also give to your children. This does of course not imply that if there are weaker results than given in the norm data for that specific age, there would be no need for training. As already mentioned in the different game descriptions, for example directional hearing or pitch discrimination can be dealt with by the brain with spending less capacity, the better the functions have been trained.

Due to this, we propose you to aim at the percent rank 80 (refer to the table below) as mid-term training aim. Our experience shows that these values can usually easily be achieved when the *Brain-Boy®* is used.



Result Analysis

Game	Aim value (mid-term-training / percent rank 80)							
	five years old	six years old	seven years old	eight years old	nine years old	ten years old	eleven years old	twelve years old
BrainB-v	77 ms	52 ms	29 ms	24 ms	22 ms	22 ms	22 ms	20 ms
BrainB-a	100 ms	83 ms	65 ms	49 ms	46 ms	45 ms	44 ms	42 ms
ClickBoy	85 $\mu$ s	68 $\mu$ s	53 $\mu$ s	42 $\mu$ s	33 $\mu$ s	29 $\mu$ s	28 $\mu$ s	22 $\mu$ s
SoundBoy	25 %	18 %	12 %	8 %	6 %	6 %	6 %	6 %
Sync-Boy	434 ms	398 ms	359 ms	322 ms	294 ms	270 ms	245 ms	223 ms
SpeedBoy	916 ms	808 ms	720 ms	616 ms	548 ms	452 ms	384 ms	324 ms
TriplBoy	355 ms	230 ms	145 ms	90 ms	60 ms	46 ms	30 ms	30 ms
Long-Boy	196 ms	176 ms	147 ms	127 ms	104 ms	83 ms	68 ms	53 ms

Percent rank

Statistic value – percent rank **80** means:

**79** percent of the children of the same age had worse values

**1** percent had the same values

**20** percent had better values



### 3.9 Result Analysis

Now compare your result reached in a **test** with the values on this page. In this table you will find the average normdata for children at the age of five to twelve years.

Normdata for adults will be available on the internet ([www.forschung.meditech.de](http://www.forschung.meditech.de)) mid-term. Until then, the data for the twelve-year-old children can be taken as reference for adults.

The listed values represent the updated results for percentage rank level 50. The data was obtained in two broad studies in cooperation with the Medical University of Hanover, conducted on 584 participants.

Important: Of course, the values can only be for orientation!

Result Analysis

Game	Normdata (average / percent rank 50)							
	five years old	six years old	seven years old	eight years old	nine years old	ten years old	eleven years old	twelve years old
BrainB-v	160 ms	108 ms	63 ms	47 ms	41 ms	38 ms	36 ms	35 ms
BrainB-a	260 ms	190 ms	136 ms	99 ms	83 ms	73 ms	68 ms	65 ms
ClickBoy	157 $\mu$ s	122 $\mu$ s	95 $\mu$ s	74 $\mu$ s	59 $\mu$ s	49 $\mu$ s	43 $\mu$ s	39 $\mu$ s
SoundBoy	50 %	39 %	31 %	24 %	21 %	21 %	21 %	21 %
Sync-Boy	528 ms	487 ms	444 ms	403 ms	372 ms	345 ms	316 ms	292 ms
SpeedBoy	1416 ms	1284 ms	1172 ms	1040 ms	952 ms	820 ms	732 ms	648 ms
TriplBoy	575 ms	405 ms	300 ms	220 ms	162 ms	142 ms	116 ms	116 ms
Long-Boy	300 ms	267 ms	240 ms	200 ms	180 ms	150 ms	130 ms	107 ms

You will have noted that the values achieved with the BBU cannot be found in this table exactly. The values which you will find on this page as well as on the following have been established by statistical means.

5. Press the corresponding the button L / R in synchrony to the individual clicks to the best of your abilities.



Press the button **L** synchronously to the left stimulus.



Press the button **R** synchronously to the right stimulus.

Hint: To get used to the frequency, leave some stimuli out before starting to press the buttons. This is also helpful if you once play out of time. If you can follow the given time exactly, the time will get faster.

If you do not follow the time exactly enough, the speed will stay the same.

6. Always adapt your pressing to the given time.

The display shows the time speed which you should reach next.

#### End of Training

250 ms

##### a) Early Program Termination

You may terminate the training any time and return to the main menu.

- Keep the start button pressed for at least one second. This will interrupt the training and return you to the main menu. Prior to that your achieved score will be shown as your "endscore".

##### b) Automatic Program Termination

In dependence to the chosen difficulty level, the program will break off the game after a set time:

Difficulty Level 1 (Starting Level 900 sec) → after 120 sec.

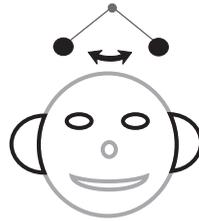
Difficulty Level 2 (Starting Level 600 sec) → after 80 sec

Difficulty Level 3 (Starting Level 300 sec) → after 40 sec

Furthermore the device will terminate the program if you reach one of the game boundaries.

- Write this result into a copy of the result table on page 42. Compare your results to the table file on page 28.

The display shows the words endvalue or topscore. After 30 seconds the game selection becomes available again. You can speed up returning to the main menu by pressing the start button.



Sync-Boy

Startvalue of level

level	standard version	slow version
1	900 ms	1800 ms
2	600 ms	1200 ms
3	300 ms	600 ms



SpeedBoy

### 3.6 SpeedBoy – Game

While playing the SpeedBoy you train and test your auditory reaction time. In many situations of everyday life it is very important to concentrate in dangerous situations.

The ability of reacting to something visual is usually very well distinct. Against that, there is frequently the difficulty to act in a special auditorial situation. Usually, these actions are innate reflexes.

In this game you hear two tones from different directions and react as fast as possible.

#### What is your training goal?

The long-term aim of the game is to react fast and to auditory stimuli, without being dependent of any help.

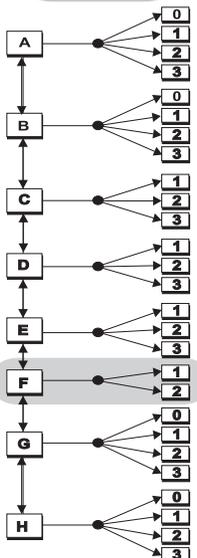
#### How do you practice?

- Put the plug of the headphones tightly into one of the two connecting sockets.
  - auditory training (with visual help): left socket
  - auditory testing: right socket
- For test and training put on the headphones corresponding to the description on the headphones. The headphone side with the sticker has to be on your left ear.
- Start the game SpeedBoy. Follow the instructions on page 10 and 11.
- Pay exactly attention to the side the tones come from, the deeper tone is important! In this game you have to answer to the tones as fast as possible after hearing the tones.
- Press one of the buttons L / R corresponding to the order of the stimuli.



#### Recommended strategy:

- Train combined with auditory and visual stimuli (left headphone socket)
  - Continue with a plain auditory reinforcement run (right headphone socket)
- Handle each training function correspondingly, possibly on a daily basis.



②  ③ Was the **first** one the differing one?  
 ①  ③ Then press the button **L**.  
 ①  ② Was the **second** tone the differing one, then press both buttons (**L and R**) at the same time.  
 ①  ②  ③ Was the **third** tone the differing one?  
 ①  ② Then press the button **R**.

If you answer correctly, the device will praise you. The next tones will be shorter and have smaller time intervals as the difficulty level increases.

If your answer was incorrect, you may try again a lower difficulty level. The following tones will be longer and have greater time intervals as the difficulty level decreases.

75 ms  
Yes

The display always shows the current length and time interval of each signal. Once you release the answering button(s) you immediately hear the next tone succession.

#### End of Training

##### a) Early Program Termination

You may terminate the training any time and return to the next menu.

- Keep the start button pressed for at least one second. This will interrupt the training and return you to the main menu. Prior to that your achieved score will be shown as your "endscore".

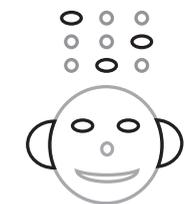
##### b) Automatic Program Termination

If you make three mistakes in a sequence of seven pairs of stimuli, the device terminates the program on its own. The display will show the value accomplished prior to the first incorrect answer as the top value.

- Write this result into a copy of the result table on page 42. Compare your results to the table file on page 28.

Furthermore, the device terminates the game automatically if you fall short of 10 ms or exceed 800 ms.

On either incident you have reached one of the program boundaries. The display will show "topscore" or "endvalue" plus the corresponding figure you accomplished. After 30 seconds the game selection becomes available again. You can speed up returning to the main menu by pressing the start button.



Long-Boy

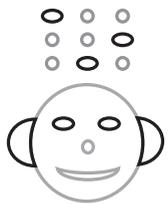
Startvalue of level

level	standard version	slow version
0	400 ms	800 ms

● 1 | 200 ms | 400 ms

2 | 100 ms | 200 ms

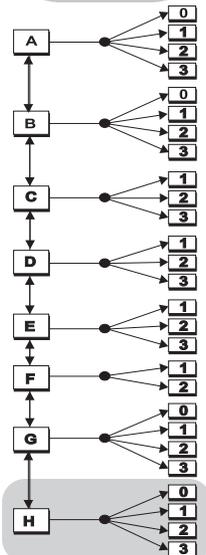
3 | 50 ms | 100 ms



Long-Boy

**Recommended strategy:**

1. Train combined with auditory and visual stimuli (left headphone socket)
  2. Continue with a plain auditory reinforcement run (right headphone socket)
- Handle each training function correspondingly, possibly on a daily basis.



### 3.8 Long-Boy – Game

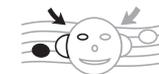
While playing the Long-Boy you test and train your ability to recognize minimal differences in a suite of tones and to distinguish them. This ability is very important to be able to discriminate auditory sound pattern clearly from others. For each sound there is a distinct auditory representation within the brain. If very short sounds differ only slightly, some people can rarely distinguish them. The more accurate the inner representation can be accomplished, the better sounds and language patterns can be discriminated and perceived. During the training you will hear a succession of three tones, two of which are identical and one is different in frequency.

#### What is your training goal?

The aim is to be able to distinguish between different sound patterns.

#### How do you practice?

1. Put the plug of the headphones tightly in one of the two connecting sockets.
  - auditory training (with visual help): left socket
  - auditory testing: right socket
2. Start the game Long-Boy. Follow the instructions on page 10 and 11.
3. Exactly listen to the three tones and pay attention to the order of the tones. The one that is different from the others is the one you need to find!  
You have up to 20 seconds for your answer. You may calmly decide which sound was the differing one.  
Advice: The signals in the particular function are louder in comparison, so please be aware of that.
4. Press one of the buttons L / R correspondingly to the order of stimuli to give your answer:



Did the first stimulus come from the **left**?

Then press the button **L**.

Did the first stimulus come from the **right**? Then press the button **R**.



If you answer correctly, the display will show your time reached, for example: 167ms.

If your answer is wrong, the device will ask you to try again the same pair of tones: again.

If you answer before hearing the second tone, the following will happen: The device will ask you to wait pair for the second tone before answering: Wait for sound. The next pair will follow your answer directly.

The difficulty level stays the same for each pair – it does not matter if you your answer was correct or wrong

160 ms

again

Wait for sound

#### End of training

You may finish the training any time and return to the main menu. Press the start button for about one second. To make an independent test possible, the game keeps the difficulty level of the task. As you cannot reach any boundaries, the device finishes the game automatically after 40 pairs of tones. The display shows the top value: 94 topscore

topscore  
195 ms

1. Write this result into a copy of the result table on page 42.
42. Compare your results to the table file on page 28.

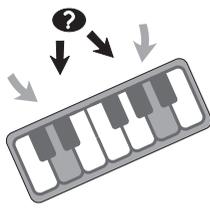
After 30 seconds the game selection becomes available again. You can speed up returning to the main menu by pressing the start button.



SpeedBoy

Startvalue of level

level	standard version	slow version
● 1	100 ms	200 ms
2	60 ms	120 ms



TripIBoy

### 3.7 TripIBoy – Game

While playing the TripIBoy you test and train your ability to recognize minimal differences in a suite of tones and to distinguish them. This ability is very important to be able to discriminate auditory sound pattern clearly from others. For each sound, there is a distinct auditory representation within the brain. If very short sounds differ only slightly, some people can rarely distinguish them. The more accurate the inner representation can be accomplished, the better sounds and language patterns can be discriminated and perceived. During the training you will hear a succession of three tones, two of which are identical and one is different in frequency.

**Recommended strategy:**

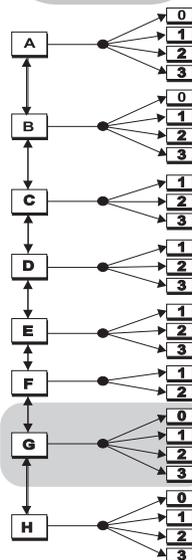
1. Train combined with auditory and visual stimuli (left headphone socket)
  2. Continue with a plain auditory reinforcement run (right headphone socket)
- Handle each training function correspondingly, possibly on a daily basis.

**What is your training goal?**

The aim is to be able to distinguish between different sound patterns

**How do you practice?**

1. Put the plug of the headphones tightly into one of the two connecting sockets.
  - auditory training (with visual help): left socket
  - auditory testing: right socket
2. Start the game TripIBoy. Follow the instructions on page 10 and 11.
3. Exactly listen to the three tones and pay attention to the order of the tones. The one that is different from the others is the one you need to find!  
 You have up to 20 seconds for your answer. You may calmly decide which sound was the differing one.  
 Advice: The signals in the particular function are louder in comparison, so please be aware of that.
4. Press one of the buttons L / R correspondingly to the order of stimuli to give your answer:



② ③ Was the **first** one the differing one?  
 ①  Then press the button **L**.

①  ③ Was the **second** tone the differing one, then press both buttons (**L and R**) at the same time.  
 ②  Then press the button **R**.

If you answer correctly, the device will praise you. The next tones will be shorter and have smaller time intervals as the difficulty level increases.

If your answer was incorrect, you may try again a lower difficulty level. The following tones will be longer and have greater time intervals as the difficulty level decreases.

75 ms  
Yes

The display always shows the current length and time interval of each signal. Once you release the answering button(s) you immediately hear the next tone succession.

**End of Training**

*a) Early Program Termination*

You may terminate the training any time and return to the next menu.

- Keep the start button pressed for at least one second. This will interrupt the training and return you to the main menu. Prior to that your achieved score will be shown as your “endscore”.

*b) Automatic Program Termination*

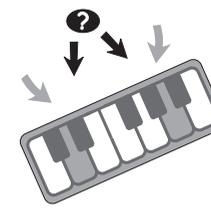
If you make three mistakes in a sequence of seven pairs of stimuli, the device terminates the program on its own. The display will show the value accomplished prior to the first incorrect answer as the top value.

- Write this result into a copy of the result table on page 42. Compare your results to the table file on page 28.

Furthermore, the device terminates the game automatically if you fall short of 10 ms or exceed 800 ms.

On either incident you have reached one of the program boundaries. The display shows “topscore” or “endvalue” plus the corresponding figure you accomplished.

After 30 seconds the game selection becomes available again. You can speed up returning to the main menu by pressing the start button.



TripIBoy

Startvalue of level

level	standard version	slow version
0	400 ms	800 ms

● 1 | 200 ms | 400 ms

2 | 100 ms | 200 ms

3 | 50 ms | 100 ms