Sales Department: +33 3 24 73 00 08
Customer Service: sav@scorpe.eu /+33 3 24 73 00 02

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VIBRAPHONE ASB 9

User Manual

Electronic search device for locating victims under debris and communicating with them through the microphone connected to the box after a natural disaster.

WELCOME

Thank you for choosing our Vibraphone®-ASB9. Please read this manual carefully before using the product. Refer to the user guide for proper use of this device!

www.scorpe.net
SCORPE Technologies,
5 route de Laon, 08190 Saint-Germainmont

TABLE OF CONTENTS

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VIBRAPHONE ASB 9

- Up to 2 wired sensors
- Wired intercom
- Stereo headphones
- IP54 control device
- Watertight carrying case
- Protective bag with strap

PRODUCT CONTENTS

Contenu du vibraphone ASB9 filaire :

x 1 ASB9 Control device
x 1 Protective bag with strap (450 g)
x 2 Wired sensors
x 1 Wired intercom
x 2 Stainless steel tips for sensors (14 g)
x 1 Stereo headphones
x 1 Cigar lighter charger (46 g)
x 1 Main charger
x 1 European adapter
x 1 UK adapter
x 1 USA adapter
x 1 Waterproof carrying case
x 1 User's manual on SDHC card 4 GB (in the ASB9)
x 1 Stylus

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ASB9 UNIT

ASB9 Control device characteristics:

Dimensions (L x W x H):	265 x 150 x 70 mm
Control device weight with battery:	1,150 kg
Housing materials:	PAFG (30)
Impact resistant:	yes
Impact resistant:	IP54
Connector's protection index (x7):	IP68
Autonomy:	4 to 6 hours (depending on usage)
Battery charge level indication:	Yes
Starting time:	<30s
Operating temperature:	-10°C to 60°C
Storage temperature:	-40°C to 70°C
SD card reader:	1
RJ45 port:	1
USB port:	1
Low-pass filter (treble - Bird):	2000Hz to 150Hz
High-pass filter (bass - Truck):	150Hz to 2000Hz
Band-pass filter (treble and bass - Bird + Truck):	500Hz to 1000Hz
Filters:	6 selectable levels by type (treble; bass; treble + bass)
Audio quality:	Stereo
Video recording time:	22 hours

Touchscreen display features

Type:	TFT-LCD
Size:	7''
Resolution :	800 RGB (H) x 480 (V) WVGA
Brightness (at center):	Min. 320 cd/m^2 to max. 1800 cd/m^2
Backlight:	Leds
Colors:	18 bits RGB 786,432 colors
Dimensions (L x W x H) :	166,6 x 109,4 x 11,5 mm
Field of view:	152,4 x 91,44 mm
Weight:	220 g
RoHS conformity:	2011/65/EU
Operating temperature:	-20°C to 70°C

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WIRED SENSORS

Dimensions (Ø x H):	Ø 94 x 123,5mm
Weight (with cable):	640g
Nb. of sensors:	Up to 2
Cable length:	8 m
Protection index:	IP67
Impact resistant:	Yes
Audio response frequency:	1Hz to 3000Hz
Sensor management:	Alone or simultaneously

INTERCOM

Dimensions (Ø x H):	Ø 74 x 117,5 mm (see drawing)
Weight (with cable):	450g
Nb. of intercom:	1
Cable length:	8m
Protection index:	IP67
Impact resistant:	Yes
Loudspeaker:	Yes
Bandwidth:	150Hz to 2500Hz
Input impedance:	>4kOhm
Sensibility:	1V/g
Gain:	adjustable from 40 to 100Db

HEADPHONES

Dimensions (L x W x H):	190 x 190 x 90 mm (see drawing)
Weight:	430g
Nb. of headphones:	1
Cable length:	1.15m
Impact resistant:	Yes
Audio quality:	Stereo
Microphone:	Yes
Nb. Connectable headsets:	1 or 2 (with Dual head option)
Power:	35 mW 8 Ohms

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POWER CABLE / BATTERY

Battery :

Dimensions (L x W x H):	130 x 55 x 20mm
Weight:	250g
Type:	9 batteries NiMH Panasonic
Each battery capacity:	2700mAh
Voltage:	10.8V
Intensity:	2.Ah
Autonomy:	4 to 6 hours
Charging time:	4 hours
Recharge cycles:	500
Charging temperature:	0° to 40°C
Unloading temperature:	-5° to 50°C
Storage temperature (less than 90 days):	-20° to 40°C
Storage temperature (less than one year):	-20° to 30°C
Humidity:	45 to 85%
Protection index:	IP54

Main charger:

Dimensions (L x W x H):	105 x 68 x 39mm
Weight:	240g
Cable length:	1830mm
Input voltage:	100-240V AC
Input frequency:	50-60Hz
Output voltage:	18V DC
Output intensity:	1;65 A
Operating temperature:	0 to 40°C
Storage temperature:	-40° to 70°C
Standby power consumption (230V):	<=30W

CARRYING CASE

Brand:	Polypro Ultracase
Interior design:	High-density foam
Foam type:	1.3lb polyurethane
O-ring purge:	70 shore nitrile
Outside dimensions (L x W x H):	550 x 350 x 240 mm
Buoyancy max:	82.1kg
Operating and storage temperature:	-40° à 99°C
Impact resistant:	Yes
Protection index:	IP67

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USER GUIDE

1. TURNING ON THE VIBRAPHONE ASB9

Press the green button to start the ASB9 Vibraphone.

Using the screen:

This screen indicates that the ASB9 Vibraphone is powered on and starting up.

After a few seconds, the next screen will appear, allowing access to the ASB9 menus.

SETTING DATE AND TIME:

By clicking on this icon, you can access the date and time settings. This step is especially important when making recordings. Entering the date and time will help you better identify your recordings.

The date and time settings are defined as follows:

The date consists of three parts: day, month, and year. The time consists of three parts: hours, minutes, and seconds. To modify a field, press and hold the button.

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4. INFORMATION ABOUT YOUR VIBRAPHONE

By clicking on this icon, you will be able to find out:
- the serial number,
- the manufacturing date,
- Scorpe Technologies' customer support phone number,
- the software version.

This screen is for informational purposes only. The values are not editable.

The data is presented as follows:

Once you have viewed this screen, you can return to the main menu by pressing the return icon on the left side of the screen.

5. SEARCH SCREEN

After connecting your sensors and headphones, press the ON icon.

You will access the search screen, which appears as follows:

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The item to be modified will then appear in red as follows:

By pressing and holding an item, it appears in red. Afterward, a click on the other elements is sufficient. In red, the value can be changed by clicking on + or -. To switch between morning and afternoon, a click on AM (morning) or PM (afternoon) toggles the value between the two. Once the modifications are made, click on the arrow to exit.

3. BUILT-IN HELP AND MANUALS FOR ASB9

By clicking on this icon, you can access the built-in manuals for the ASB9 in different languages.

You also have access to the recommended ASB9 search method.

This screen allows you, by simply pressing the flag of your choice, to consult the user manual and search techniques in the language corresponding to the small flag displayed on the screen.

Once the language is selected by pressing the chosen flag, the user manual and search methods appear on the screen, similar to the one below:

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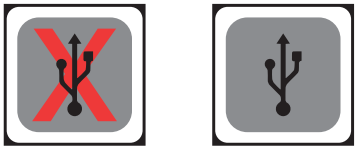
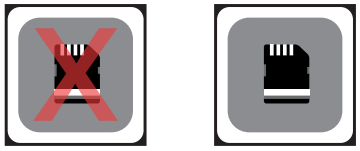
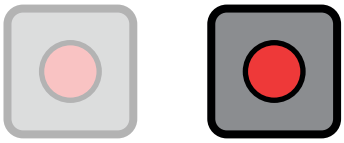
Here are the descriptions and functions of the different icons on the screen:



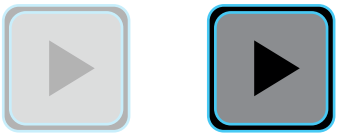
The USB icon indicates the presence or absence of a USB connection. By default, the USB port is disabled.



The SD icon indicates the presence or absence of an SD card in the designated slot. The SD card is used for recording desired sequences using the ASB9's recording function.



The recording icon allows you to start and stop a recording. When the icon is in its "transparent" version, it means that your recording is in progress.



The playback icon on the search screen allows you to access recordings stored on your SD memory card. By pressing the icon in its "vivid" version, you can access the following menu:

To access this menu, you must first have made a recording. To play it, press the playback icon in front of the recording you wish to play. When the icon is "transparent," it means that your recording is currently playing.

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6. FILTER SETTINGS

The "filter" icon provides access to the high-pass, low-pass, and band-pass filter settings menu.

The menu appears as follows:

To use these menus, please follow these steps:

The high-pass filter eliminates low-frequency sounds.
Decreasing the value of this filter reduces the amount of low-frequency sounds detected by the sensors, leaving only high-pitched sounds.

The low-pass filter eliminates high-frequency sounds.
Decreasing the value of this filter reduces the amount of high-frequency sounds detected by the sensors, leaving only low-pitched sounds.

The band-pass filter eliminates both low-frequency and high-frequency sounds, leaving only a specific frequency range where sounds are detected.
Decreasing the value of this filter narrows the frequency range detected by the sensors.

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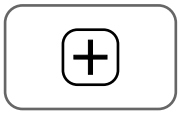
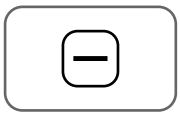
Thus, there are three types of filters that you can enable or disable.



By default, when you activate a filter, its value is set to the maximum (no filter applied).



By pressing the + or - icons, you can adjust the value of each filter to your preference.

Once the filters are set to your liking, you can return to the main screen by pressing the menu exit icon.

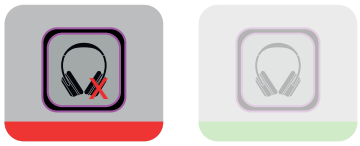
7. COMMUNICATION MENU.

This icon provides access to the communicationme

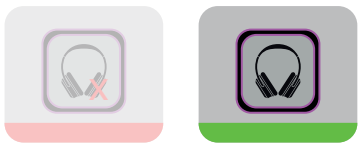
This menu is presented as follows:

From this screen, you can choose the type of communication you wish to have:

- Either hear only the victim
- Or hear the victim and be able to converse with them



In this configuration, the microphone is not engaged, so rescuers can hear the victim, but the victim cannot hear them.



In this configuration, the rescuers' microphone is active, allowing them to communicate with the buried victim to ensure their attention or check on their well-being.

Volume adjustment for the headset can be done using the arrows located on the right side of the screen.

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8. READING THE BARGRAPHS

The bargraphs allow you to monitor the intensity of the signal detected by each of the sensors connected to the ASB9.

They are graded from 1 to 10, with 1 representing the weakest signal intensity detected by the sensor, and 10 representing the strongest intensity.

The values of these bargraphs will fluctuate each time a sound is detected, with the goal of achieving the strongest signal possible on all connected sensors to indicate the position of the buried victim.

The bargraphs only oscillate when a signal is detected by a connected sensor and that sensor is activated on the ASB9.

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ASB9 CONNECTIVITY

1	Stereo headphone jack.
2	Power on / off the device.
3	Device operation indicator.
4	Status indicator.
5	Microphone / Speaker jack.
6	Right vibration sensor jack.
7	Left vibration sensor jack.
8	Touchscreen control display.
9	USB port.
10	USB port.
11	SD card reader.
12	External power input for charging the batteries.
13	Ethernet port.

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LOCALIZATION TECHNIQUE

The localization process occurs in two stages:

1°) **Detection:** This involves determining whether or not there is a live victim buried. Grid the area in 10-meter strips, place the sensors at regular intervals, and listen for any human-originated noise.

2°) **Localization:** After detecting a victim, and to determine their precise location, it is necessary to scan the area more closely.

To ensure thorough probing of all areas and precise victim localization, a systematic approach is needed.

Identify the sound level using three levels of perception:

- Level '0' indicates the absence of any perceived sound signal.
- Level '1' indicates a perceived sound signal that is not identified as of human origin (could be noise).
- Level '2' indicates a perceived sound signal identified as of human origin.
- Level '3' indicates a clearly perceived sound signal that is unequivocally of human origin

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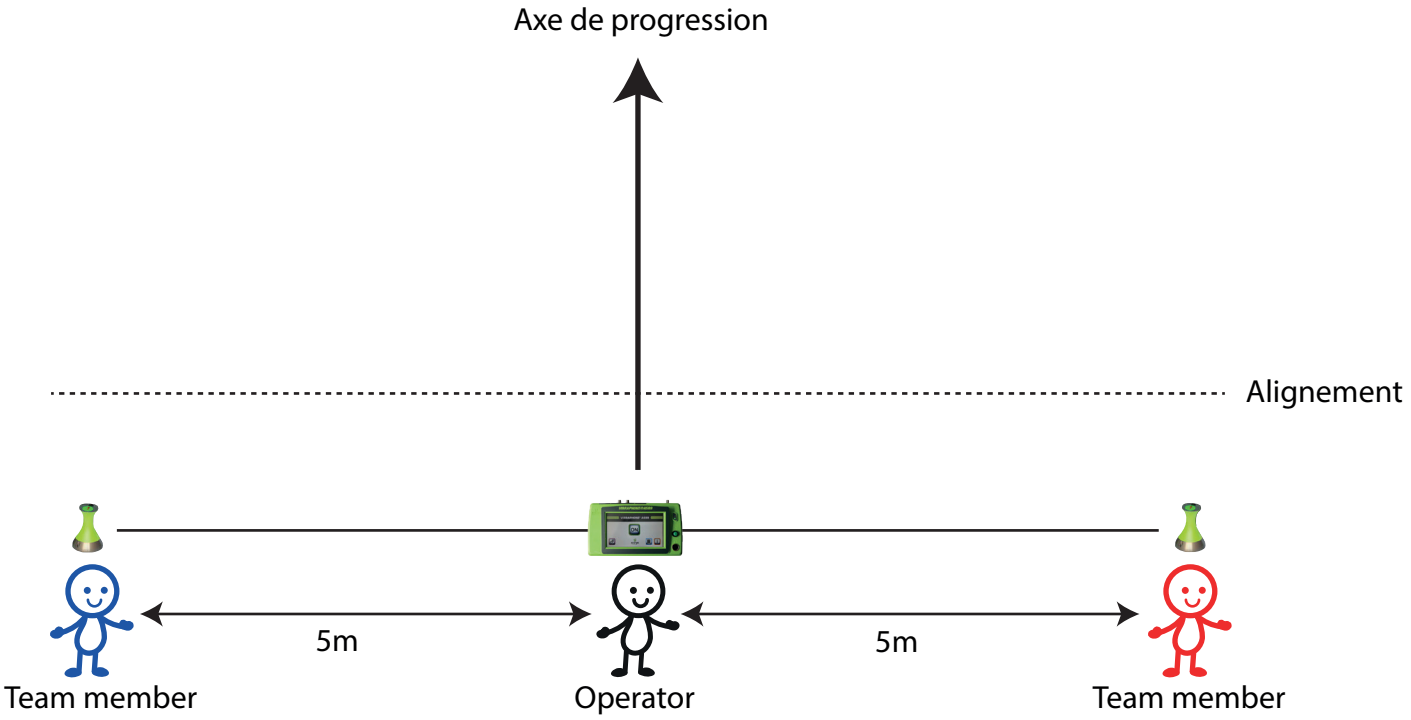
SEARCH PROCEDURE

The team consists of one operator and two team members, each responsible for a sensor. The operator listens to the audio signals perceived through the headphones and notes the corresponding positions of the sensors.

The operator instructs the team members to position the sensors: using the commands 'silent, please!' followed by 'call!,' the team members transmit the call signal. The operator listens to the audio signals emitted by the victim in response to the call signals. These audio signals are picked up by the sensors and displayed both on the screen and in the operator's headphones.

Next, it is necessary to establish a progression axis: the sensors are placed at a distance of 10 meters from each other. The sensors and the operator are aligned perpendicular to the progression axis.

The team members and operators are in the following situation:



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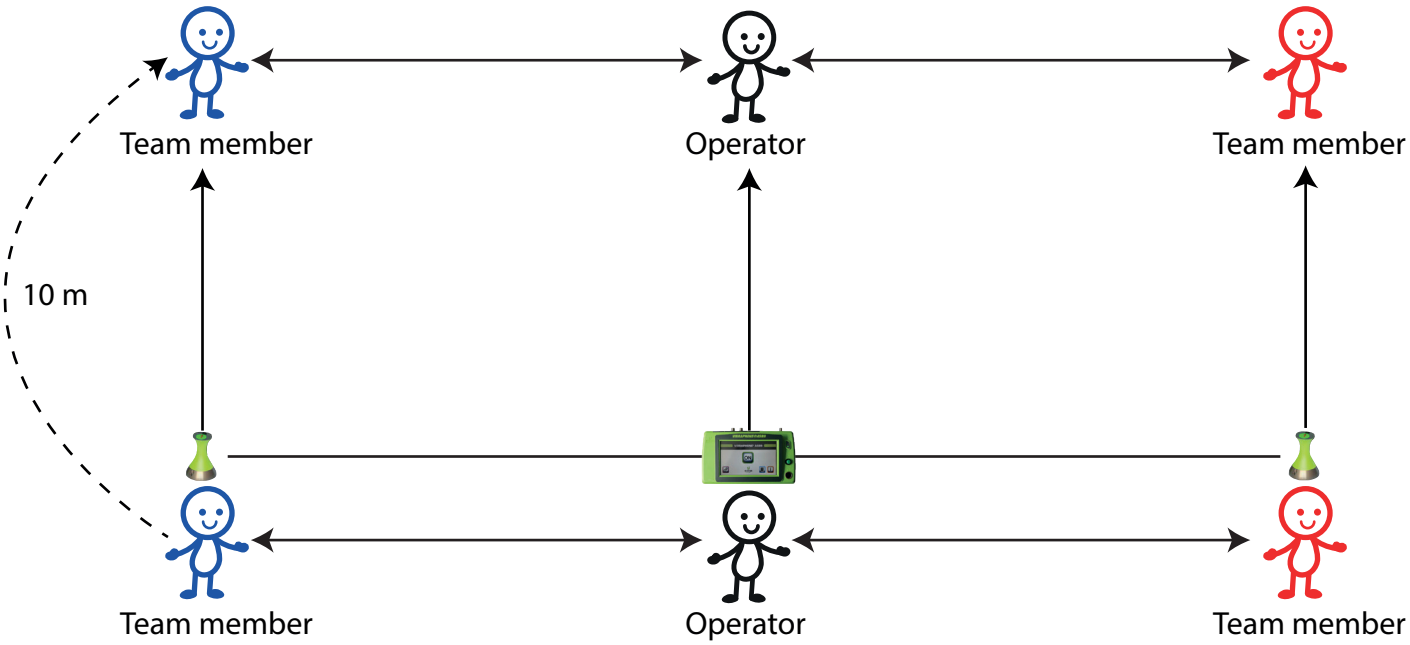
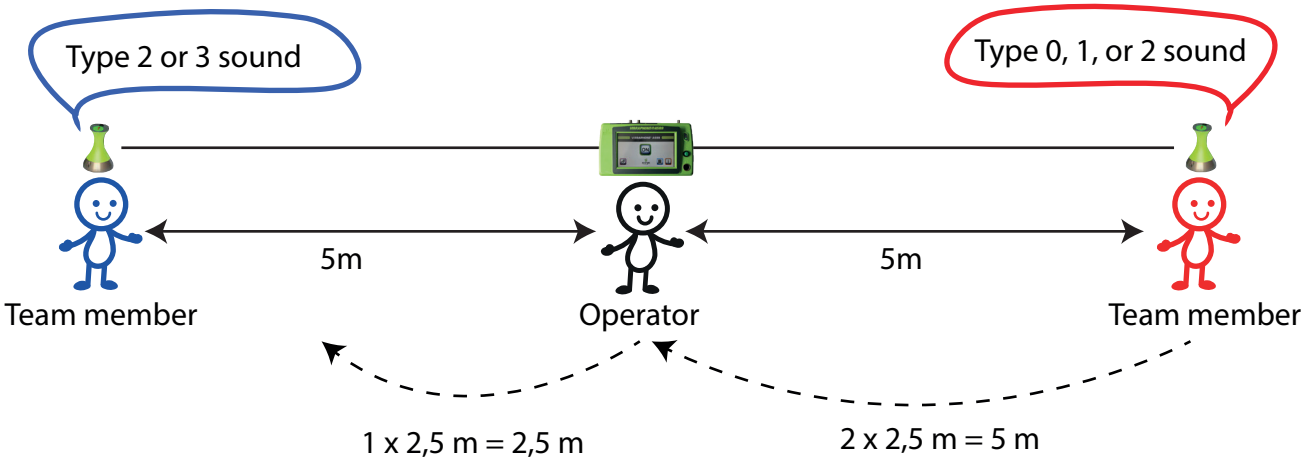
As long as no sound of human origin (0 or 1) is perceived on both sensors, the device progresses in 10-meter increments as follows:



Next step:

One of the sensors (the blue one, for example) detects a type 2 sound that is stronger than the other sensor, or it detects a type 2 sound while the other sensor does not. The blue sensor serves as a reference and remains stationary. The red sensor is moved closer through dichotomy (the distance between the two sensors is divided in half at each step).

This results in a movement as follows:



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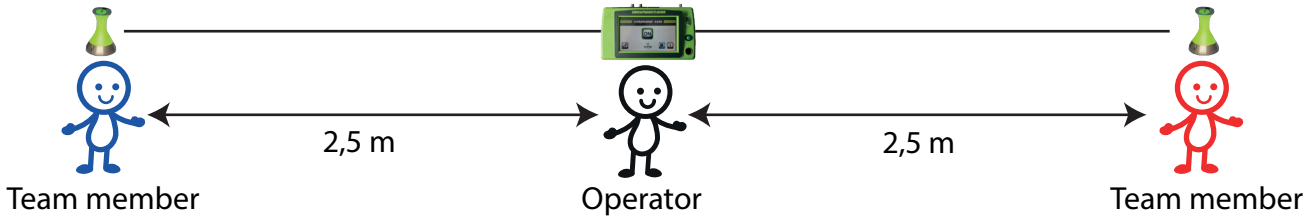
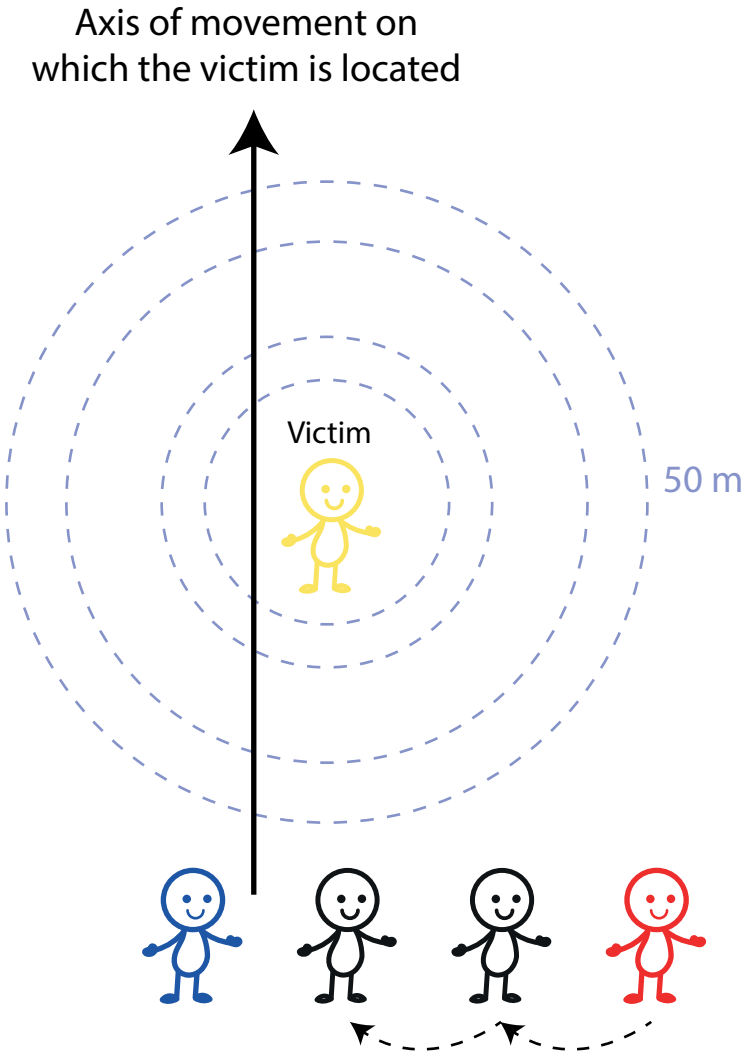
Following this movement, the operator and the team members find themselves in the following position:



The red sensor is gradually moved closer to the blue sensor until the perceived volume is the same in both sensors. It is important that both sensors are on the same type of terrain (that conducts sound in the same way). It is then known that the victim is located on the perpendicular bisector of the segment formed by the two sensors as follows:



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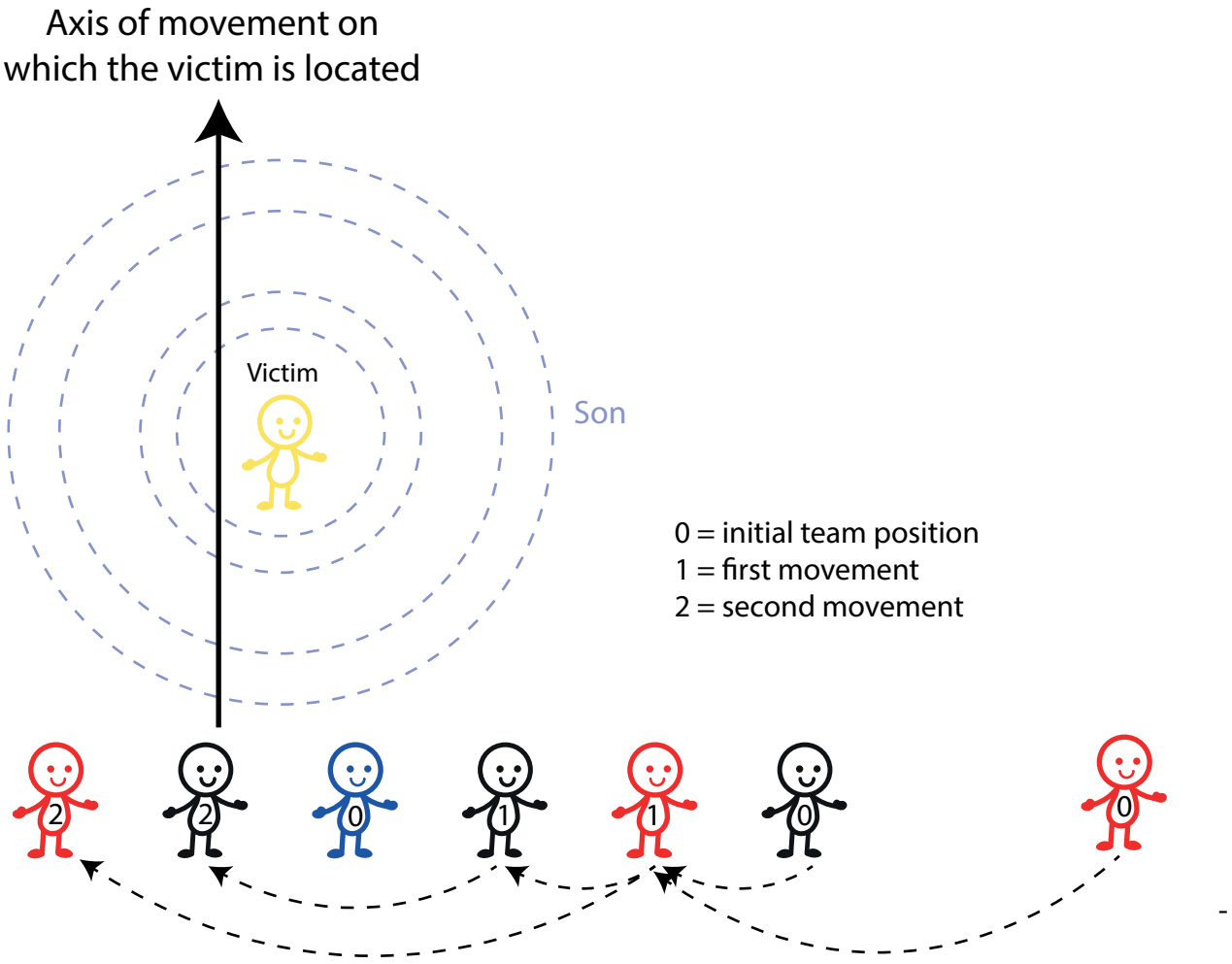
If, at a distance of 2 meters from the blue sensor, the red sensor still does not perceive the sound as strongly as the blue sensor, it means the victim is on the other side of the blue sensor, as follows:



Initially, the team is at position (0). The blue sensor has the strongest signal. The operator and the red sensor move halfway closer (1). The signal from the red sensor is still not as strong as the blue sensor. Therefore, the victim is on the other side (2). The operator and the red sensor switch to the other side.

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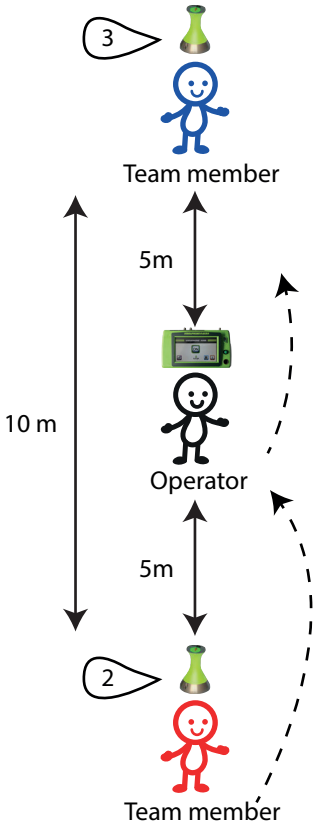
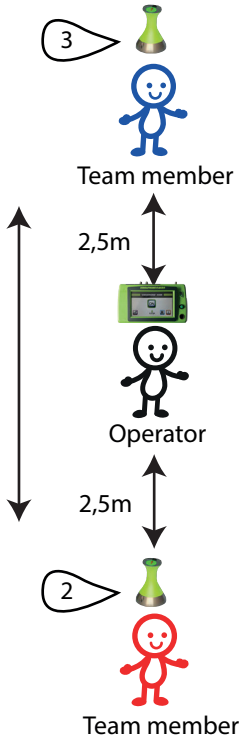
Next step: Localization along the axis.

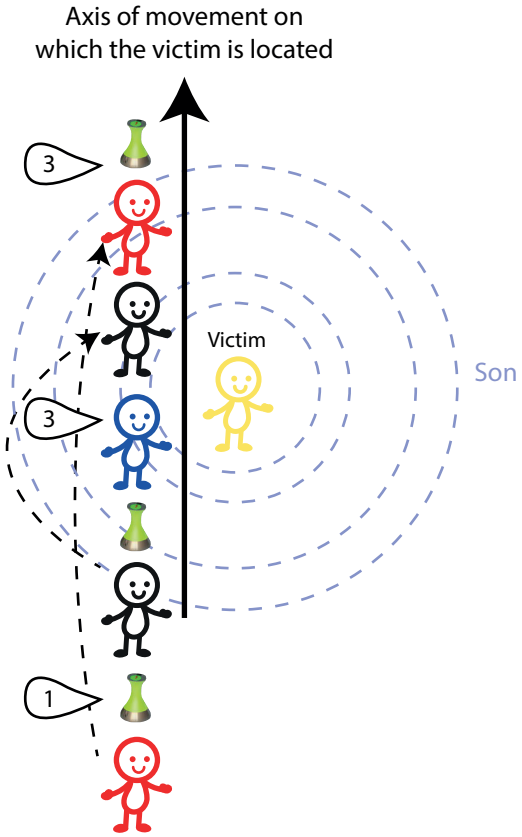
The operator is placed in the middle of the segment formed by the two sensors, which are 10 meters apart on a defined axis. The sensor that perceives the strongest signal (in this case, the blue one) becomes the reference sensor; the other sensor moves toward it through dichotomy (reducing the distance by half).

At the beginning:



After movement:





This way, the victim's location is pinpointed to within a meter.

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CONTACT
5 route de Laon, 08190 Saint-Germainmont
Sales Department: +33 (0)3 24 73 00 08
Customer Support: sav@scorpe.eu / +33 (0)3 24 73 00 02