This Manual is intended
for explanation Anker-4E
design & principal of operation
as well as direction for its use

For proper equipment application
study this Manual in depth

All information contained
in this manual is subject to change
without notice.

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INTRODUCTION

Anker-4E I.E.D. Delay Fuse Detector (here and after **Detector** fig.1) is intended for detection explosive devices with watch retarders as well as radio proximity fuses with active command decoders.

Fig 1

Detector is able to detect mechanical, electromechanical and electronic watch devices (fig. 2), control units of body-worn explosives and radio-transmitters used for remote control of explosive devices.

Fig 2

DESIGN AND PRINCIPLE OF OPERATION

Detector is designed to be used by employees of law-enforcement staff and security service personnel

Detector main unit incorporates built-in magnetic (H) & electrical field (E) sensors, comprehensive low-noise amplifier, filters and microprocessor to control all operation modes.

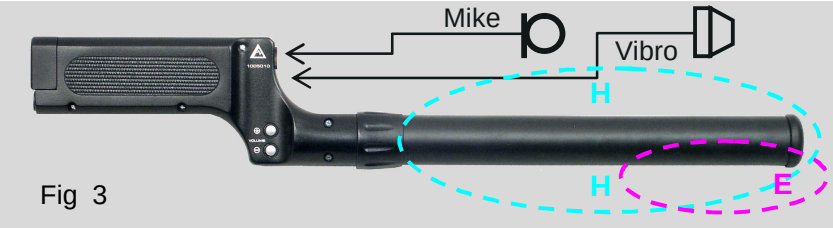

Fig 3

Detector set is completed by air conduction microphone - high-quality regular mike and ‘contact’ microphone - vibro-acoustic sensor.

Microphone and vibro-sensor are connected to the main unit via cables and plugs (fig. 3).

Anker-4E Detector operational principle is based on detecting weak electromagnetic and vibro-acoustic fields generated by circuit and mechanism used in retarders to detonate remote controlled explosive devices.

ANKER-4E MAXIMUM DETECTION RANGE
(*based on laboratory and field tests)*

Questioned object	Detection range
Mechanical watch (via microphone sensor)	Up to 100 cm
Electro-mechanical watch ‘H’-mode	Up to 40
Electro-mechanical wrist-watch ‘H’-mode	Up to 40
Electronic desktop watch ‘E’-mode	Up to 5
Electronic wristwatch ‘E’-mode	Up to 5
Electronic control unit ‘H’- & ‘E’-modes	Up to 10

Detector is designed for manual operation. The instrument handle is shaped to facilitate the unit operation in various positions.

The main unit assembly, contact and air conduction microphones are sensitive precision devices and must be protected from impact, strong electromagnetic fields and extremes of temperature.

NOTE: In particular, ‘E’- mode is intended for detection electronic watches with 32.768 kHz reference oscillator.

ANKER-4E COMPLETE SET (Fig.4)

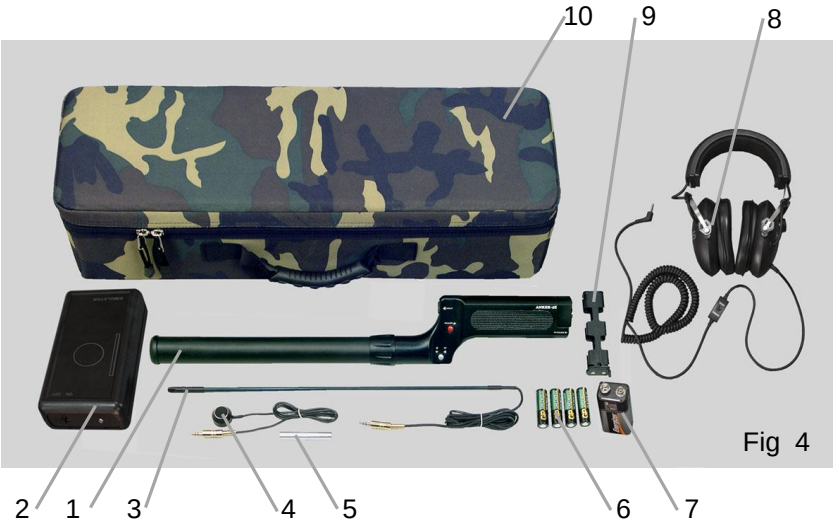

Fig 4

1. Detector main unit with built-in H- & E-sensors
2. Imitator (test unit)
3. Air conduction microphone
4. Contact microphone (vibro-sensor)
5. Adhesive compound
6. Four AA alkaline cells
7. 9V battery
8. Headphones
9. Battery holder
10. Transport-storage bag
11. Operational Manual (not shown)

INDICATION, CONTROLS AND CONNECTORS

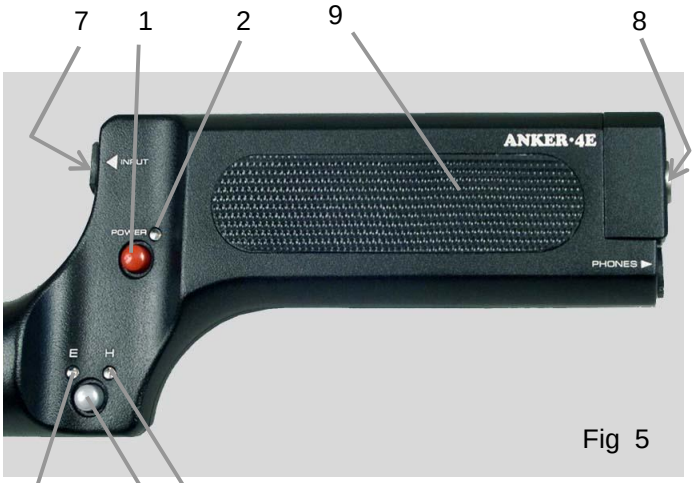

Fig 5

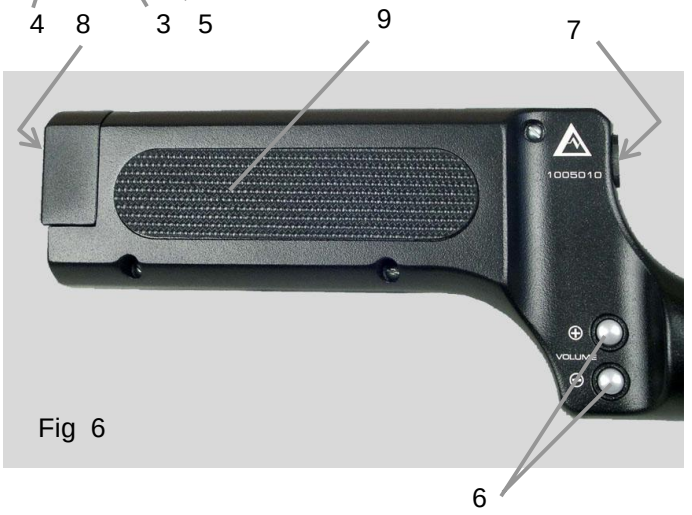

Fig 6

On the left hand side are located (Fig. 5)**:**

1. Power On/OFF switch
2. On/OFF Indicator
3. 'H' mode ⇆ 'E' mode switch button
4. 'E' mode confirmation LED
5. 'H' mode confirmation LED

On the right side (Fig. 6) are:

6. Headphone volume control buttons

On the front and bottom end (Fig. 5-6) **of the handle** are:

7. Microphone and vibro-sensor input jack
8. Headphone input jack
9. Main unit battery compartment

HEADPHONES (Fig.7)

Fig 7

High quality user-friendly sound-proof embouchures ensure operator's convenience and comfortable signal monitoring

NOTE:

1. Put “Mono-Stereo” switch in to ‘Stereo’.
2. Turn volume-control on the right cap into ‘max’ position

HEADPHONE CONNECTION
TO DETECTOR MAIN UNIT (Fig.8)

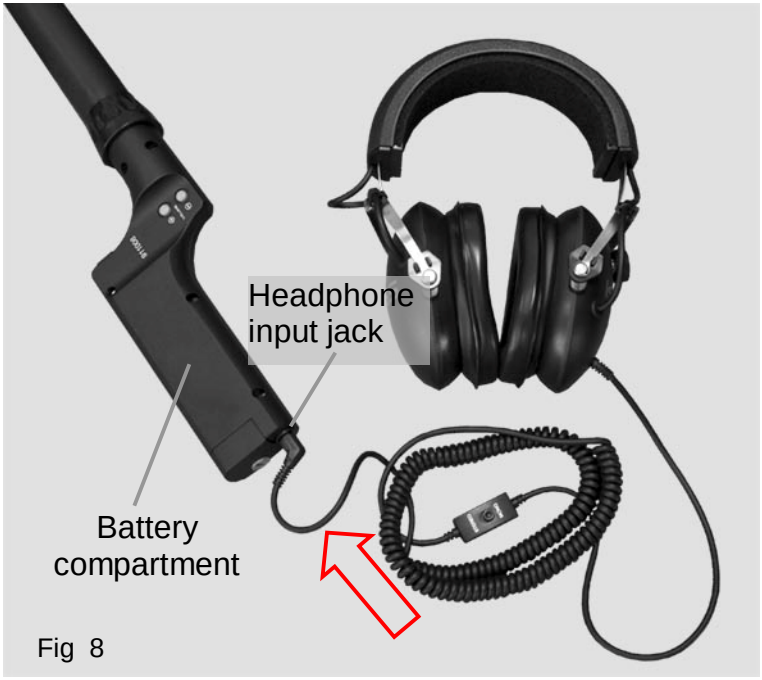

Fig 8

POWER SUPPLY

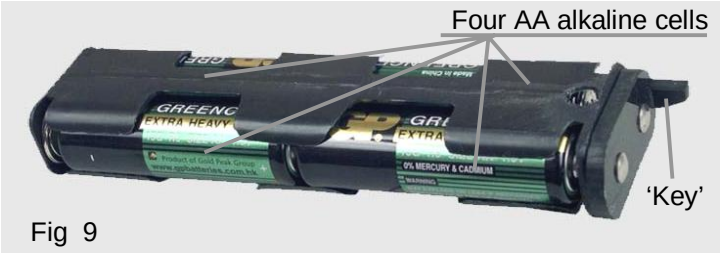

Fig 9

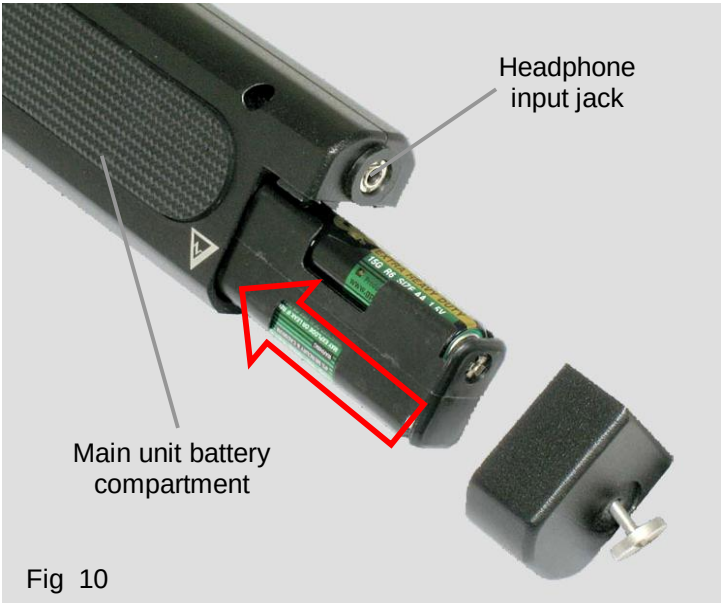

Fig 10

Detector is power supplied by 4 AA cells in a dedicated battery holder. Special 'key' on the front end of the holder is for its proper orientation and battery set polarity (fig. 9-10).

Use only alkaline primary cells

to obtain maximum efficiency of Detector

IMITATOR (Test Unit) (Fig. 11)

Magnetic & electric field imitator (Test Unit) is intended for Detector workability control.Imitator

Fig 11

1- **H**-operation-mode check mark

2- **E**-operation-mode check mark

3- 9V battery

4- Power-on indicator

5- ON/OFF switch

Imitator represents a separate unit with a 9V battery as a power supply (Fig. 12).

Fig 12

SENSITIVITY ZONE in 'H' & 'E' operation modes

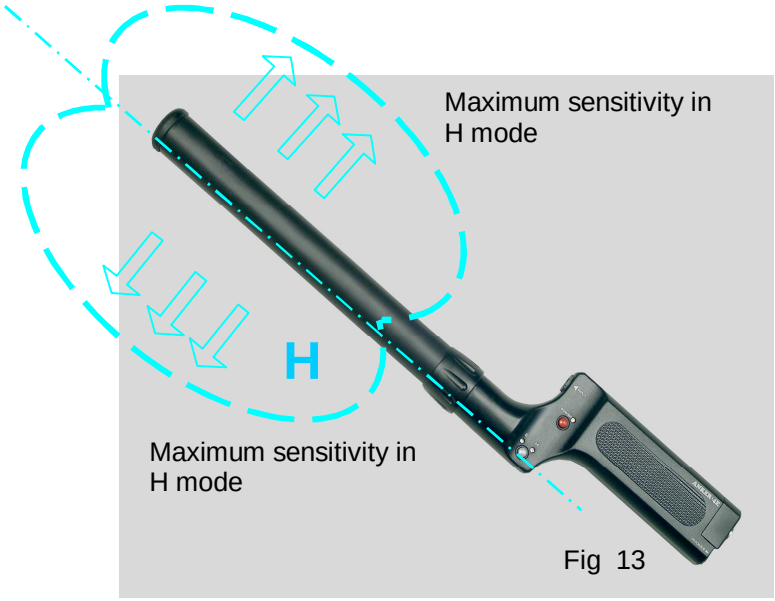

Fig 13

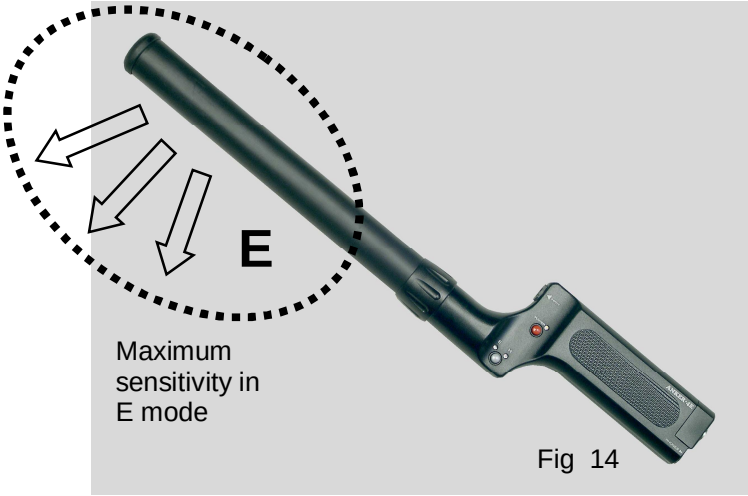

Fig 14

GETTING STARTED

1. Open transport / storage bag and take **Detector** and its accessories from it (Fig. 11).

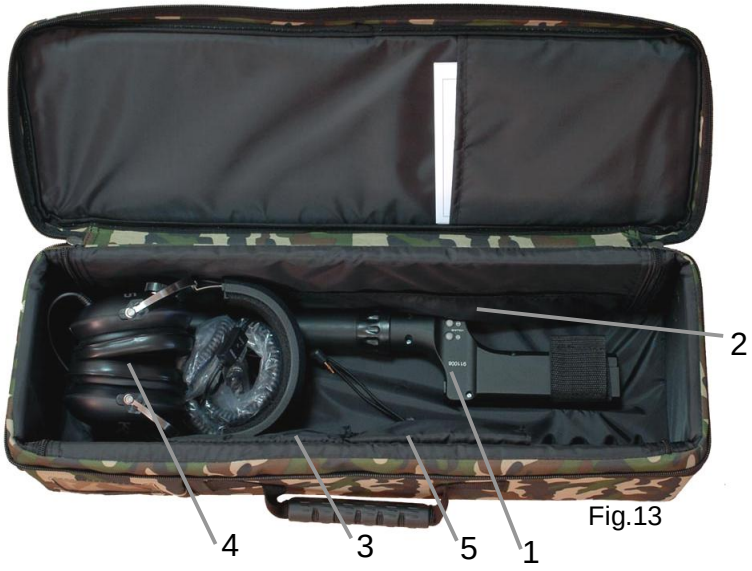

Fig.13

2. Carry out visual inspection of **Detector** main unit, accessories, their cables and connectors for possible damage and contamination as well as Operator backpack for breaks and tears.

NOTE: After long-term exposure to a low temperature keep Detector packed in a standard bag at least 2 hours for evening up its temperature with the environment.

3. Put four fresh AA cells into a battery holder (see fig. 9)
Insert battery holder into main unit battery compartment – front end to the main unit battery compartment (ref. fig. 10). Pay special attention to battery holder ‘key’ orientation for its correct polarity
4. Couple headphones to a corresponding jack of the main unit (see fig. 8).

ANKER-4E DETECTOR EFFICIENCY CHECK

1. Press ‘Power’ button to switch on **Detector,** green LED will shine in confirmation (item 2 on the fig. 5).
After switching on Detector automatically turns into ‘H’-mode confirmed by Red LED. (item 5 on the fig. 5)
2. **Place Detector far from possible source of EM interference: power electric lines, installations and appliances**.
3. Insert 9V battery into **Imitator** battery compartment (see Fig. 12).
4. Switch on **Imitator**

5. Place **Imitator** at a right angle to longitudinal axis of the **Detector** main unit as it shown at the Fig. 14 .

Fig 14

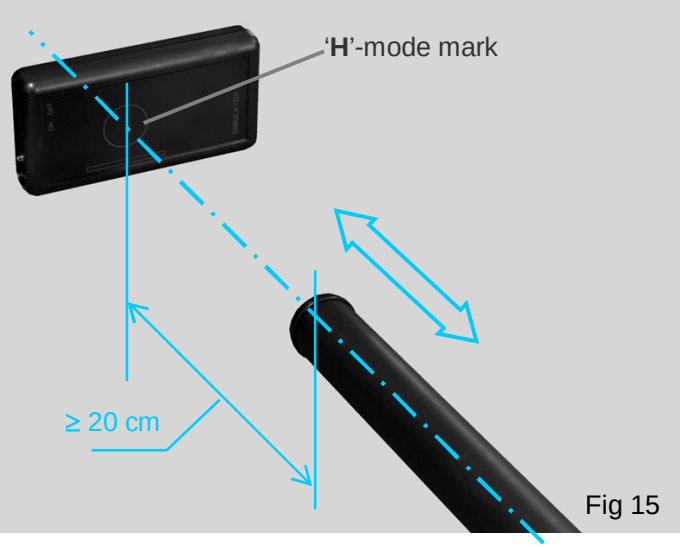

Fig 15

The axis of antenna should pass through the centre of ‘H’ mark on the **Imitator** body (Fig. 15).

6. Keeping orientation of the instrument, move it slowly back and forth to the mark (fig. 12). An interrupted ‘beep’ audio signal will be heard in the headphones.

7. Detector is in a good operational condition if the distance between the mark and the tip of the device antenna unit is more than 20 cm.

8. Switch over **Detector** to ‘**E**’ operating mode.

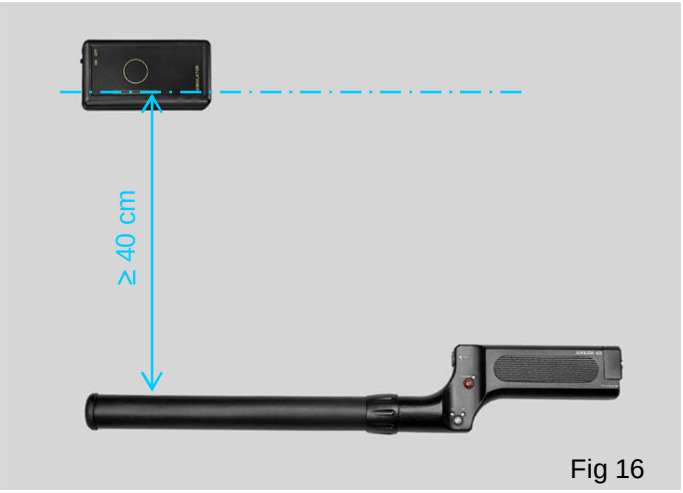

Fig 16

ATTENTION: After 'E'- mode activation hold Detector far from possible EM interference source in an invariable position over its 'calibration time' - approx. 8 sec. This mode is verified by tone signals chain in the headphones. 'Calibration' completion is confirmed by shot audio signal.

8. Place antenna unit of the **Detector** parallel to 'E' mark on the Imitator body (Fig.16).

9. Typical high frequency audio noise will be heard in the headphones.

10. Detector is in a good operational condition if the distance between the mark and antenna unit of the device is more than 40 cm.

ATTENTION: Shot interrupted audio signals with 1 Hz repetition rate in the headphones indicate the device overloading. If so – move in far from the target!

SEARCHING

SENSIBLE PRECAUTION

‘Anker-4E’ Detector corresponds to completely passive electronic device is entirely safe for an operator.

Fig 15

Meanwhile, it is not advisable to start inspection of a suspect object when the local time is close to a‘ round‘ value (fig. 15), for example: 09:15, 09:30, 09:45, 10:00 hrs and etc.

NOTE: During inspection, operator should remain in the close proximity to suspicious item for the minimum period of time necessary for operation.

All adjustments and manipulations: battery installation, mode selection, microphone and headphone preparation should be performed at a safe distance from suspicious object. The inspection itself, should then be carried out as quickly as possible.

Advanced user operating this equipment must be aware of, and not deviate from, any governing regulations which may apply at the time when explosive devices are being investigated.

1. Place **Detector** at least 1m from the item to be investigated and switch on 'H' operating mode. Use maximum sensitivity zone of **Anker-4E** 'H' sensor

2. Move Anker-4E slowly (not faster than 5 cm/s) along, and parallel with the surface of the object, listening carefully via headphones for the sound of any 'second' rhythm, clicks or ticking of electromechanical watch devices (fig. 16-18).

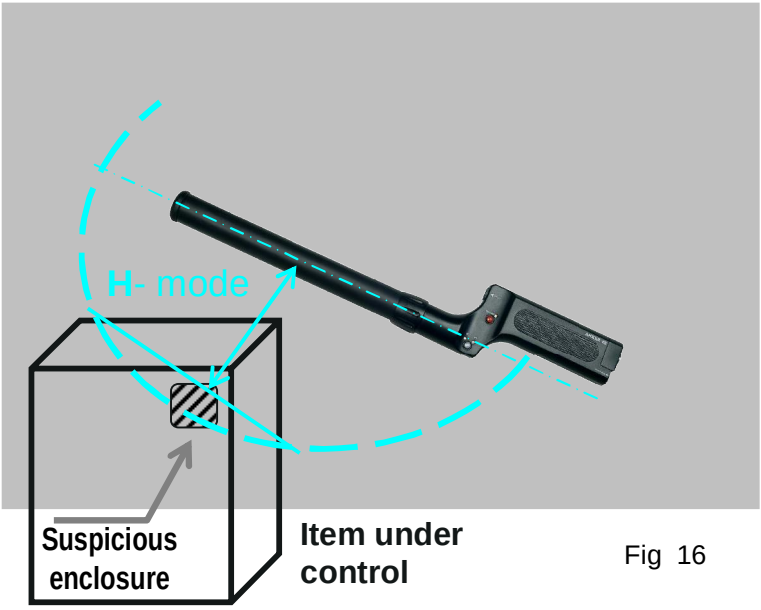

Fig 16

2. Switch over **Detector** into ‘E’-mode and repeat inspection procedure taking in to account its antenna directivity in this operating mode (see fig 14).

Fig 17

Fig 18

USING MICROPHONE AND VIBRO-SENSOR

If the packing of a suspicious object has accessible openings or if an opening can be easily made in it (e.g. paper, cardboard) then microphone probe can be used to detect mechanical watch devices.

Couple microphone plug to the input socket (fig. 19).

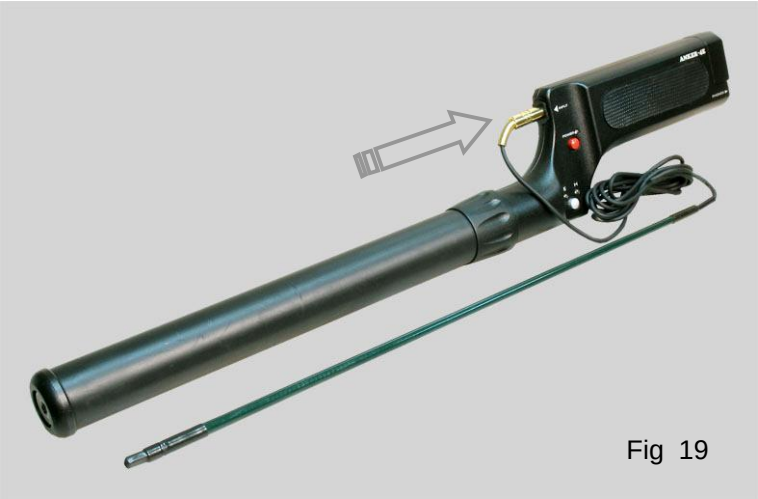

Fig 19

NOTE: Coupling microphone plug will automatically switch over Detector to acoustic signal analysis mode.

Prepare for the inspection by moving away from suspicious object to the maximum possible distance and set maximum volume which does not cause self-excitation of the system (‘positive’ feedback).

Approach the object, insert microphone probe inside the packing of the object (fig.20) and, within approximately one-minute period, listen carefully to any received signals, trying to detect the typical clicks or ticking from mechanical or electromechanical watches or timers.

Fig 20

NOTE: This particular mode can be used as well to inspect difficult to access recesses and ducting in buildings, under seats, car exhausts and etc.

On the other hand, contact microphone (vibro-sensor) is used for inspection suspicious objects with a hard casing and no suitable access for the air conduction microphone (suitcases, packing cases etc.).

Connect the plug to the corresponding jack as before then fasten vibro-sensor to the object using the adhesive supplied (fig. 21-23). Plasticine, putty or tape can also be used.

Fig 21

The subsequent procedure is then as for the air conduction microphone.

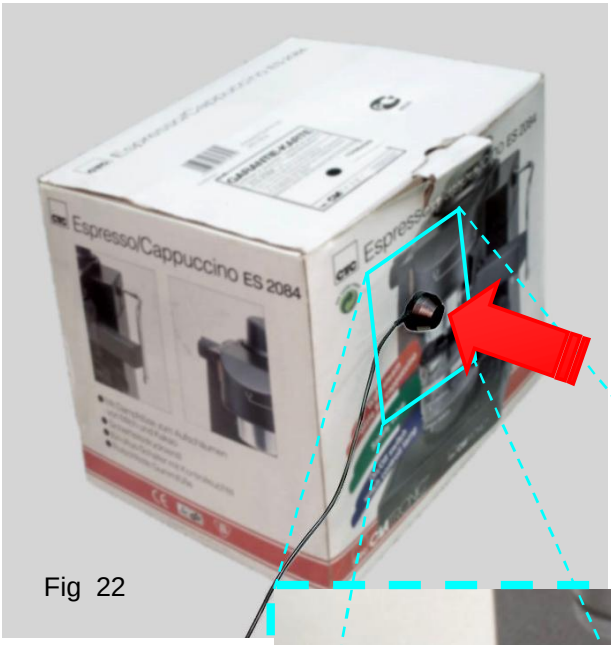

Fig 22

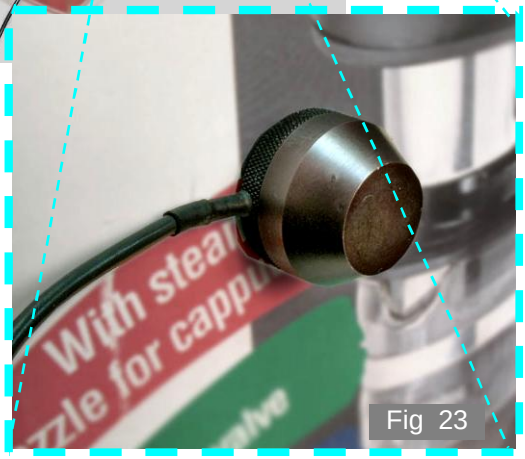

Fig 23

ESSENTIAL NOTE: ***The absence of signals from suspect object does not guarantee the absence of explosive devices with some other type of fuse.***

By the end of inspection switch off the power, remove the headphones and replace the instrument in its storage bag

ANKER-4E MAIN TECHNICAL DATA

Power supply	4 AA, (LR6) cells
Current consumption (in silent mode)	Not more than l8 mA
Operating Life (4 x new alkaline batteries)	Not less than 40hours
Dimensions	510 x ∅34 x 90 mm
Operating Temperature Range	+5…+40°C
Weight (with batteries)	600 g

CARE AND MAINTENANCE

1. Clean the equipment with a wet rag and let it dry.
2. Check the equipment for possible damage.
3. Charge the batteries if necessary.
4. Check the presence of every component and pack them in the carry bag.
5. Report any faults and deficiencies.

SHIPPING

Anker-4E can be shipped in standard packing in a passenger cabin by any kind of transport.

Prevent **Detector** in standard packing from shock and vibration.

STORAGE

Anker-4E should be stored in its standard packing in heated premises under the temperature within the range +5°C…+40°C and relative humidity not more than 80% (under +25°C).

For storage take out battery holder with AA-cells from the **Detector** body.

FOR NOTES