

S E C U R E H O U R F R E E D O M

Mode d'emploi
Instruction for use
Gebrauchsanweisung
Istruzioni d'uso
Modo de empleo



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Description of the unit A

■ Top:

- 1** On/Off strap switch
- 2** Transmit/Receive switch (SOS / Search)
- 3** Directional arrows
- 4** Loudspeaker
- 5** Receiver intensity/sensitivity adjustment (Advanced=analogue mode)

■ LCD screen

- 6** Indicator showing simultaneous detection of multiple victims
- 7** Initial search distance indicator
- 8** Battery status/distance indicator
- 9** Battery status indicator
- 10** Indicator showing use of Advanced (=analogue) mode with sensitivity level (9=max. sensitivity, 1=min. sensitivity)

■ Underside:

- 11** Battery compartment cover
- 12** Reminder: Switching on - Switching to receive mode - Simulation of initial search by one or more rescuers **1** - Secondary search **2** - Final search (last cross) **3**

harness

primary search

B One rescuer

C Several rescuers

Exclusive features of the ARVA Advanced:

- A powerful 457 kHz ± 20 Hz transmitter with transmission level independent of battery power.
- In numerical (standard) mode, the search band width is 40 m.
- Multiple victim indicator and automatic synchronisation on closest victim.
- In Advanced (= analogue) mode, indication of a scale of progress and, in multiple victim situations, indication of estimated distances along field lines.
- SCAN function by signal strengths makes it possible to isolate victims in the case of multiple burials.
- Auto-control of frequency adjustment and transmission level every 5 minutes.
- 16 bit processor with extremely fast analysis speed.

installing batteries

The ARVA ADVANCED operates exclusively with four standard LR03 alkaline batteries. Open the battery compartment cover ① with a screwdriver or coin. The four batteries should be of the same brand and be replaced at the same time. Insert the batteries carefully in the order shown inside the compartment.
N.B.: Do not store the unit at a temperature of less than 0°C to avoid damaging the batteries. **DO NOT USE** rechargeable batteries. Remove the batteries if the unit is not used for any length of time.

switching the unit on

- Fasten the On/Off strap ①
- Auto-control: the direction diodes ② light up from left to right, and the LCD screen comes on. 3 beeps are emitted if the loudspeaker is in working order.
- Check your batteries using the battery life indicator scale levels ③
 ③ 11 levels: 99,90, 80, 70, 60, 50, 40, 30, 20, 10, 0.
- The LCS screen then goes off and the central diode ④ flashes to indicate that the unit is in transmit mode.
- Check Transmit/Receive functions before setting out. The person checking the unit puts his ARVA in transmit mode and all the other members of the group check that their ARVAs detect the signal properly in receive mode. The operation is to be repeated in the opposite direction so that ALL the ARVA units in the group are checked in both transmit and receive modes.

Possible anomalies...

The ARVA ADVANCED performs a self-test every 5 minutes to check the state of the batteries, frequency setting, transmission power, etc.

If the unit detects an anomaly, a 5-second beep is emitted, 3 times, separated by 5 minute intervals. This means one of two things:

- The battery charge has dropped to 20% (the unit can still transmit for 48 hours or search for half an hour). After the 5-second beeps, 20% will stay displayed on the LCD screen to remind you to change the batteries as soon as possible.
- Technical problems connected with transmission or programming: after the 5-second beeps, the LCD screen displays Er (= Error). Do not set out with any unit displaying this message.

information for your own security

Whenever you leave marked-out ski runs or trails, you are in an area where there are certain risks, particularly of avalanches. When moving around in the mountains, you do so at your own risk:

- Before setting out, check the local weather with a reliable weather station or professional mountain guides and carry the right equipment. In particular, take an ARVA and carry a shovel and a probe. But remember, this equipment will not detect avalanches or provide complete protection and to be fully effective, you need to familiarise yourself with the use of the ARVA beforehand!
- Never go off on your own and do not follow any trail you happen to see: they are no guarantee of safety. If there is any doubt about the stability of a slope you have to cross, YOU MUST leave a good distance between one another or better, cross it one by one. Keep a good eye on one another.
- Finally, it is best to give up if you are not sure! Be careful: snow conditions change, and with them the risk of avalanches. Get to know about avalanches. In France, a free catalogue and documentation can be obtained from ANENA (Association Nationale pour l'Etude de la Neige et des Avalanches, - tel. 04 76 51 39 39 / www.anena.org).

using the arva

The ARVA ADVANCED has two operating modes:

- Standard (numerical), involving use of the right and left directional arrows. The device automatically locks on to the closest victim. Follow the indications given in the form of figures and the direction shown by the red diode. If pictogram 6 lights up, the device has detected multiple victims.
- Advanced (analogue with numerical aids), in which receiver sensitivity is adjusted with the ⑤ and ⑥ buttons. In analogue mode, the Advanced symbol is displayed on the screen with a sensitivity level value (1,2,3,4,5,6,7,8 or 9). 9 corresponds to greatest sensitivity (distant search) and 1 to lowest sensitivity (close search). In this mode, the device shows all the signals received. If there are multiple victims, it indicates the estimated distances to each one.
- SCAN function via signal strengths with the ⑦ and ⑧ buttons. As soon as you switch to the SCAN function, only the signal strength value appears (numbered from 1 to 9), the sound cuts off and you can scan each of the concentric circles of research surrounding you (or in other words, by each signal strength value, or each calibration) separately from the others. 9 corresponds to the highest signal strength value number (scan of the signal strength the furthest away) and 1 to the lowest signal strength value number (scan of the nearest signal strength).



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useful information:

Move forward **SLOWLY** to avoid going too hastily in the wrong direction. The entire surface of the avalanche must be investigated. When searching for a victim or testing the unit, stay away from electrical equipment (high-voltage power lines, radios, mobile phones, etc.) or impose radio silence (these are just a few examples). This is applicable when using any ARVA-type transmitter-receiver. The distance indicator indicates progress along a field line and not a distance in metres.

Simply press simultaneously on the **⊕** and **⊖** buttons for 3 seconds to flip from **Standard (numerical) mode to Advanced (analogue) mode** (Advanced logo and sensitivity level are displayed on the LCD screen). Repeat this operation to return to **numerical mode** (the logo and sensitivity level disappear from the LCD screen). This can be done at any time, even if rescue workers have begun their search in Standard (numerical) mode.

We shall now take a look at the two main modes and study an example of a search in the case of multiple victims. The cases presented are «typical» ones. With training and experience, the user can change from Standard (numerical) mode to Advanced (analogue) mode depending on how familiar he is with the device and the situation in which he finds himself.

Case of a single victim †

standard (numerical) mode

■ Primary search (approach phase) (cf D1)

- Pull 2 SEARCH.- The device is automatically in completely automatic numerical mode. The LCD screen displays the arrow diagram continuously until you pick up a signal from the victim.
- Move backwards and forwards across the avalanche as shown in diagram B if you are the only rescuer or diagram C if there are several rescuers.
- Hold the ARVA horizontally, pointing it downwards (cf. photo), and sweeping it slowly from left to right and right to left (making an angle up to 180°)
- Continue until you pick up a first clear signal (directional arrows and distance indicator light up)

N.B: If the ARVA has already picked up a signal it will go directly to the secondary search.

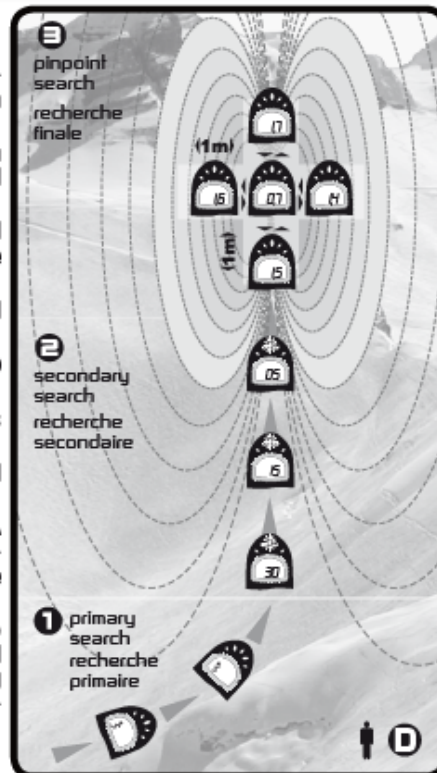
■ Secondary search (locating phase) (cf D2). This phase starts when the victim's signal has been picked up.

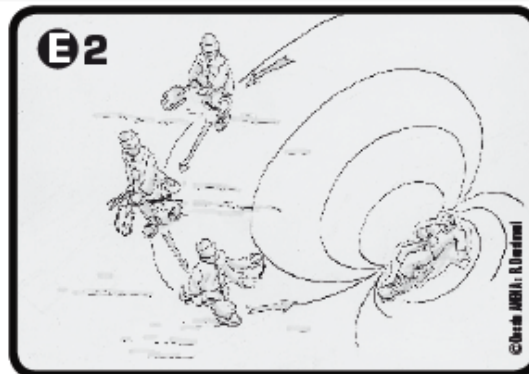
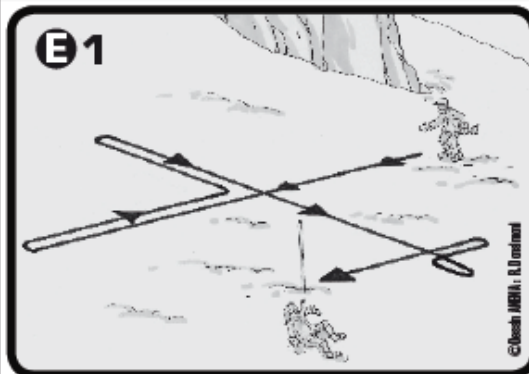
- The ARVA gives you a distance indication on the LCD screen and one of the directional arrows lights up.
- As soon as one of the directional arrows lights up, point your ARVA in such a way that the central diode lights up and head in that direction. **If the numbers decrease, you are moving closer to the victim. If not, go in the opposite direction.**
- Always try to make sure that the central diode is lit. Sweep the unit gently in the directly in which the arrows light up. This will enable you to cover the shortest possible distance before reaching the victim. Continue moving forward until the distance indicator displays 3.0.

■ Final search (detection phase) (cf D3)

At this point, with the arrow lit up, lower the ARVA unit as close as possible to the snow, pointing it in the same direction and keeping it horizontal. The beeps become faster and the distance indicator keeps decreasing. Keep moving forwards as long as the number decreases. If it starts to increase, return to the point where it is smallest and locate the victim using **the cross technique, always pointing the ARVA in the same position.**

■ **Cross technique:** The ARVA must be moved as closely as possible to the snow, in parallel straight lines. Determine the point along the line where the distance indicator displays the smallest number and the beeps are emitted very close together or continuously. From that point, move perpendicularly and repeat the operation. The point at which the maximum signal is obtained is vertically above the transmitter. If necessary, repeat the operation once or twice to obtain a more precise position. However, it is not necessary to determine an extremely precise location using the ARVA. In fact, it is usually faster to start searching with a probe as soon as the likely location has been determined to within about 50 cm.





advanced (analogue) mode

Diagrams E1 and E2.

When the ARVA is switched to advanced mode, its sensitivity is maximum (level 9). However, the Advanced symbol flashes if the sensitivity level is to be reduced. Decrease the sensitivity with the **⊖** button until the symbol stops flashing. When the symbol stops flashing, you can use the numbers, which give an estimation of the distance that still needs to be covered.

■ **Initial search**

Moving forward, turn the device in every direction until the first audible signal is heard. If the signal is weak, continue to move in the same direction without changing the position of the device until the sound is clearer and sufficiently distinct to be of help. The initial search is over when a clear signal is obtained.

■ **Secondary search (cross or directional search) There are two possibilities:**

• **Cross technique Diagram E1:**

As you move forward, keep the ARVA in the same position. It must be moved parallel to itself. When the first signal is obtained, keep moving in a straight line. The beep becomes louder and the distance indicator decreases. Once the maximum signal has been reached and starts to diminish, return to the approximate point where it was strongest. Reduce the sensitivity to minimum in order to detect the point where the beep will be loudest, and start moving in a line perpendicular to the previous direction. You will soon realise if you are moving in the right direction, as the signal will quickly become louder, or in the wrong direction, in which case it will diminish. Once again, find the point where the beep is loudest, as previously. Continue until the sensitivity is positioned on one of the two last levels (minimum sensitivity, and therefore minimum search distance).

• **Directional method Diagram E2:**

To determine the direction to follow, sweep the ARVA from left to right over 180°, holding it horizontally. The stronger the signal, the louder the beep will be (and the lower the distance indicator). The right direction is the one in which the beep is the loudest. If the beep gets louder as you move forward, you are going in the right direction. If it gets weaker, you are going in the wrong direction. Turn round, walk back a few metres and check again to find the right direction. As you advance, turn down the sound level with the **⊖** button (so that it is easier to determine where the ARVA is emitting the loudest beep). When the sensitivity is down to 2 or 1, the secondary search is finished.

■ **Final search**

You are very close to the victim when the sensitivity is down to 2 or 1 (the actual level depends on the depth at which the victim is buried). The cross technique should then be used (see opposite). Remember that in this case the distance indication is replaced by the intensity and frequency of the beeps. The closer you get to the buried victim, the louder and faster the beeps are emitted. When the distance between the transmitter and receiver is very small, a single continuous beep is emitted.



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Situations with multiple victims ¶¶ ...

N.B: This is one possible method for finding victims. The user may decide to stay in Advanced mode for the entire search and adjust the sensitivity level with the **+** and **-** buttons to isolate signals from different victims

■ Start with the initial search if necessary, in either Standard (numerical) mode or Advanced (analogue) mode.

In the secondary search phase, if indicator **⊕** is lit, this means that the ARVA is picking up several signals around you, **mark the area with a ski or pole ¶ (F2)**.

In standard mode, the ARVA will automatically lock on to the unit emitting the strongest signal, which is theoretically the victim closest to you. Once you have found the first victim (F3/v1), locate him using your snow probe and mark the location

■ Return to the point that you marked earlier and switch the ARVA to Advanced (Analogue) mode (F4): the unit will indicate the various signals it has picked up.

Several estimated distances are displayed, along with various levels of sound depending on how close they are.

*N.B As soon as you switch to Advanced mode, the unit will automatically revert to sensitivity level 9 (maximum range). Use the **-** button to lower the level and search for the second victim.*

■ When you pick up the signal from the second victim, two estimated distances will be displayed on the LCD screen.

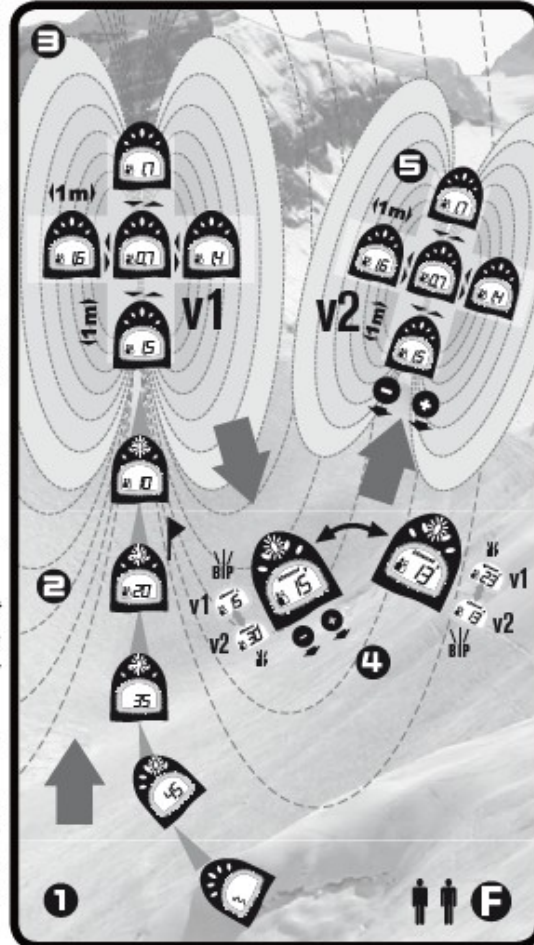
To obtain a closer estimate, reduce the sensitivity until the victim's signal is barely audible and focus on the higher figure (the lower figure with a strong signal corresponds to the first victim v1 and the weaker signal to the distance of victim v2).

Determine the direction to follow by sweeping the ARVA from right to left and attempting to reduce the distance of the higher figure. Once you have found the right direction, move forward, taking the number of steps indicated.

One of the figures will increase and the other decrease, while at the same time one of the signals will increase and the other decrease.

When you have taken the number of steps indicated, switch to Standard (numerical) mode (F5). Make a SLOW sweep with the unit. The ARVA will automatically lock on to the closest victim, i.e. the second one. Repeat the standard mode search, as in the case of a single victim. If you return towards the first victim, go back to the starting point (where you obtained the multiple victim signal) and try to find the direction for the second victim in Advanced mode.

N.B. In the case of multiple victims, it is advisable to use an earphone to distinguish the various signals more clearly.





scan function by signal strength calibration

Note: This method is one of the options for resolving the situation.

Begin your primary search if necessary...

- In the secondary search phase, if the device detects a multi-victim situation, the lamp ☹ will light up, meaning your device has detected several transmitters around you.
- Then continue your search, following the standard method for a single buried victim.
- The device will automatically lock onto the device emitting the signal which is the strongest, and therefore theoretically the victim closest to you. You have found the first victim (v1); locate the person with your avalanche probe and mark how they lie.

You can then switch the device over to SCAN function. To switch over the device, switch the selector ☹ several times quickly back and forth between transmission and reception. As soon as you are in SCAN mode, the sound cuts off and only the Advanced mode signal strength remains displayed (1).

You can carry out a SCAN by signal strength calibration in this function. Example:

- In signal strength 1 (closest surrounding circle of research), I detect a victim (v1) (distance and direction of the victim who has just been located).
- Note: Press on the ⏪ button of the device to sweep each signal strength calibration for a scan of each surrounding circle of research (see diagram G). Wait for two or three repetitions of the information (numbers and directions) to not head off in the wrong direction...
- In signal strength calibration 2 and 3, no victim is detected, ☹ appear on the LCD screen.

Continue to scan each signal strength calibration...

- In signal strength calibration 7: the device shows me a signal at 12, to the right. I know then that my victim v2 is in the circle of research 7 at about 12 steps to the right... Orient the pointer of the avalanche beacon in the direction given to validate that this is the right direction correction for v2.

Then continue to scan up to signal strength calibration 9...

I can then head in this direction and go back to Digital mode to carry out my secondary or final phase search for v2.

Note: Scanning by signal strength calibration makes it possible to "eliminate" the signal received from a nearby field to try to detect another victim in another signal strength calibration.

To head in the right direction after having located victim v1 in SCAN function. Wait for 3 repetitions of information with numbers + directions in each signal strength calibration. If you are several rescuers, you can orient the others by scanning in all the other signal strength calibrations and giving orders for the different buried victims...

Note: The scan by calibration (or in other words, by signal strength) correspond to distances in meters. These data are purely approximations, since they depend a great deal on the position of each transmitting or receiving antenna (and other physical factors).

Calibration or signal strength: 1/0.70 cm, 2/0.70 cm to 1.50 m, 3/1.50 m to 3 m, 4/3 m to 4.50 m, 5/4 m to 6.50 m, 6/5 m to 10 m, 7/7 m to 15 m, 8/11 m to 25 m, 9/18m to + than 35 m.