

# RECCO R9

development and cooperation plans  
for advanced technology for rescue  
teams

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# Topics

 technology

 history

 development issues



# Topics



 R9

 distribution

 training tips

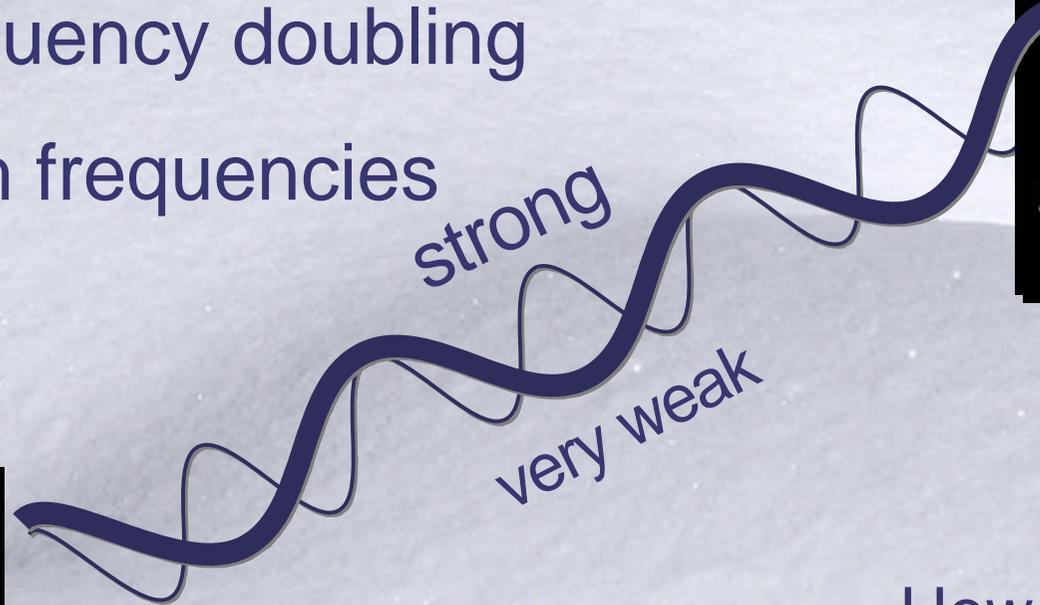
# Technology

system

challenges  
(differences in signal strength)

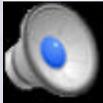
# System

- ❄️ 2-part system
- ❄️ harmonic radar
- ❄️ frequency doubling
- ❄️ high frequencies



How strong?  
How weak?

# Relative Sound Signal Strength



❄ jet engines  
taking off — 160  
dB

❄ RECCO  
transmit —  
160 dB



❄ rustle of  
leaves —  
10 dB

❄ RECCO  
receive —  
10 dB

however, the decibel (dB) is a base-10 logarithmic ratio

# Relative Sound Signal Strength



❄ RECCO  
transmit —  
160 dB



❄ RECCO  
receive —  
10 dB

Difference of 150 dB is  
actually a difference of  
 $\text{Log}_{10} 15$

however, the decibel (dB) is a base-10 logarithmic ratio

# Sound Signal Strength Difference

$$150 \text{ dB} = \text{Log}_{10} 15 = 10^{15} =$$
$$1.000.000.000.000.000$$

# Challenge

Detector size:  
having the transmit antenna in  
the same case as the  
receive antenna

# History

1973 – avalanche accident (SE)

1970s – research

1981 – first prototype

1983 – first commercial detector

2008 – R9, 9th generation of detectors

# Research & Development



mid 1970s

# Research & Development

movie camera used  
/ to record data

mid 1970s

# Research & Development



2008

# Detector Development

1983 – R1



1997 – R5



1.7

2008 – R9



0.95 kg

# Cases



R2



R8



R9



easier to carry

Re



2008



1983

# Detectors

transmit



1000 m

receive

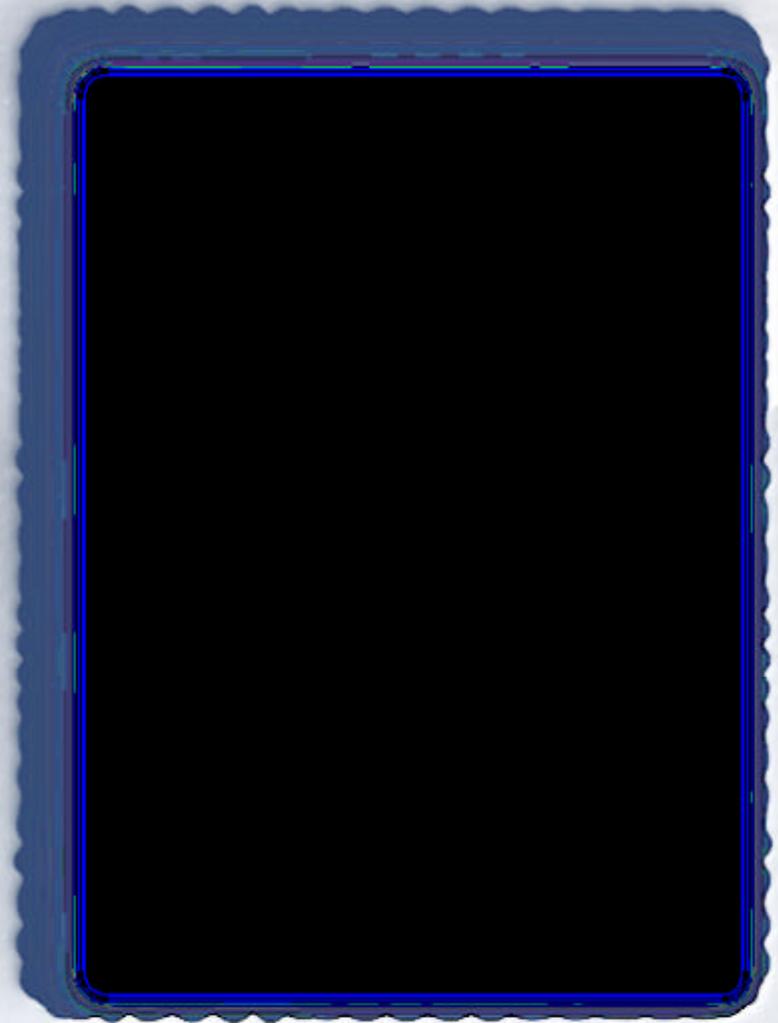


transmit and  
receive antennas  
had to be separated

Late 1970s

# Detectors

 transmit and  
receive antennas  
closer together



1981

# Detectors

transmit

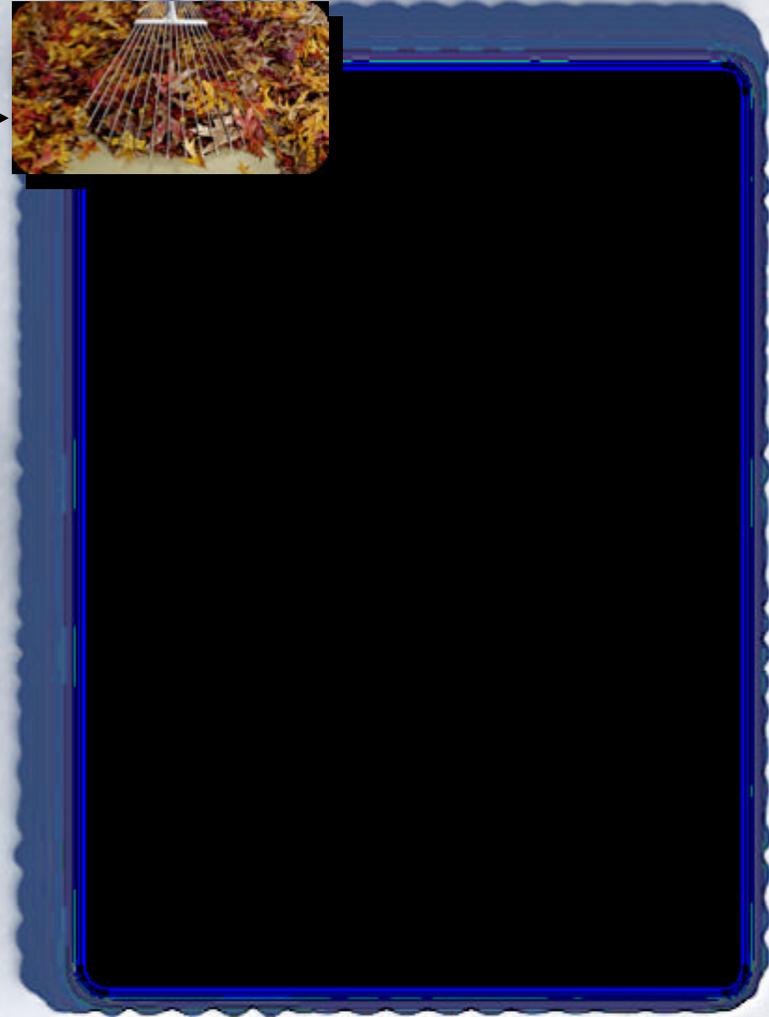


500 m

receive



transmit and  
receive antennas  
closer together



1983

# Detectors

transmit



50m

receive



transmit and receive  
antennas even closer  
together



1997 – R5

# Detectors

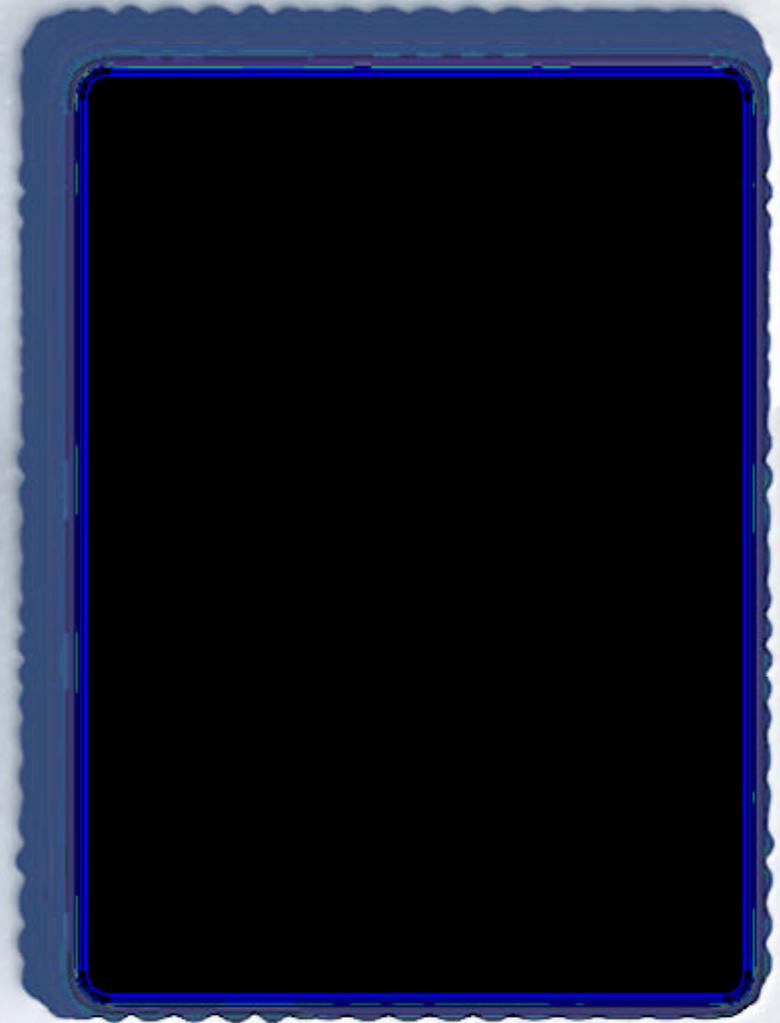
transmit

receive



10m

- ❄ transmit and receive antennas very close together
- ❄ caused serious problems of interference



R9 – 2007

# Detectors

transmit

receive



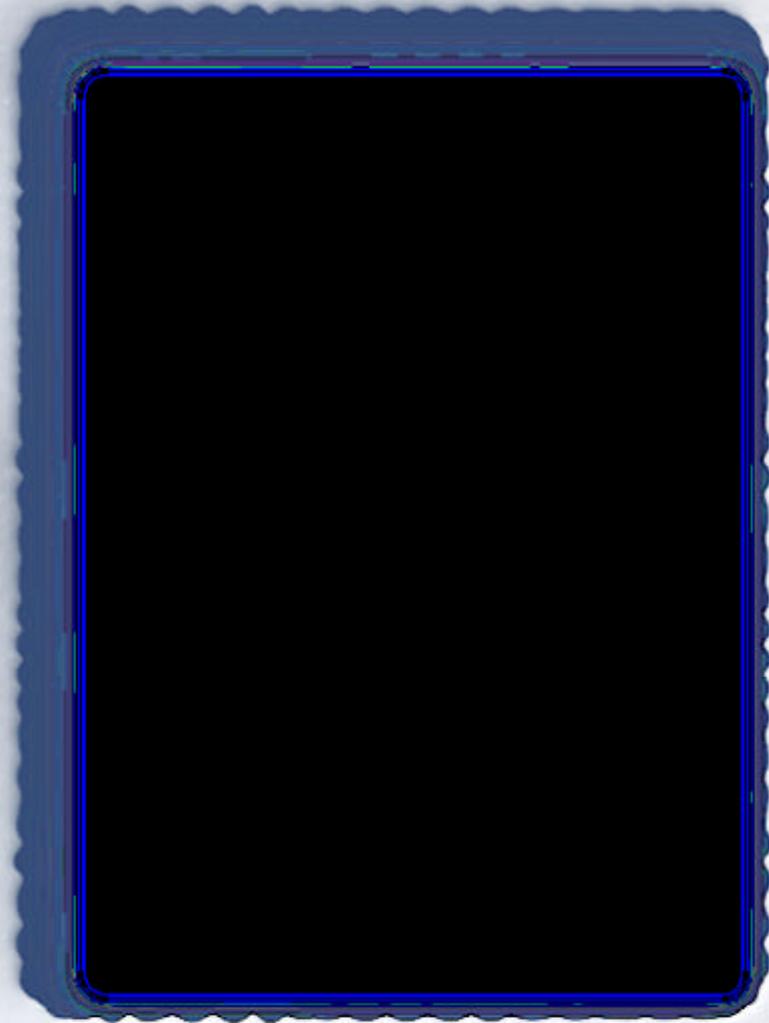
10m



“cross talk”,  
transmit signal  
overwhelmed  
receive signal



resulted in long  
delays

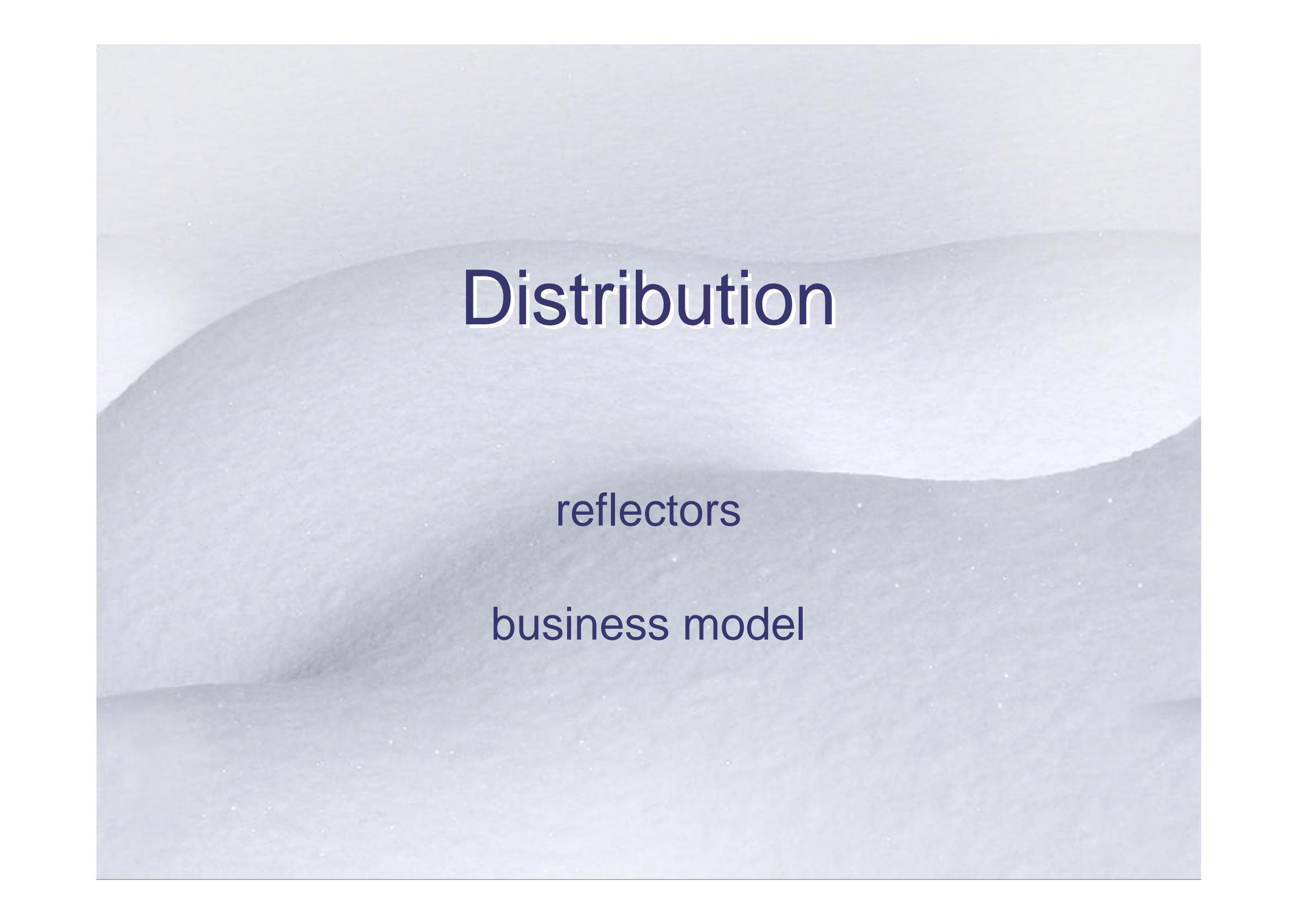


R9 – 2008

# R9



- ❄️ two functions
  - RECCO search
  - 457kHz receiver
- ❄️ lithium-ion battery
- ❄️ performance – same as R8
- ❄️ smaller and lighter

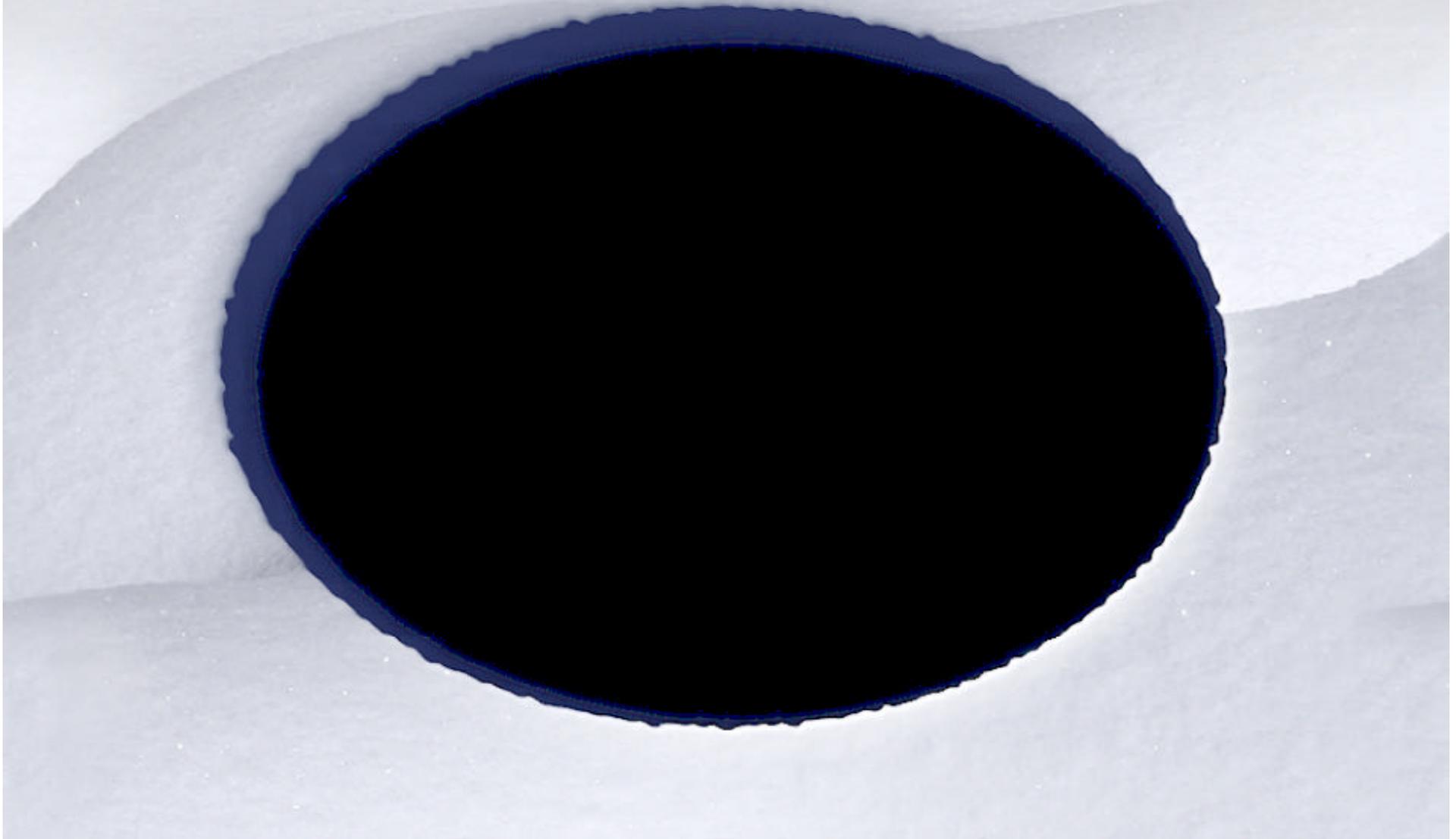


# Distribution

reflectors

business model

# Reflectors



# Reflectors

about 10 million skiers  
worldwide this decade

+200 brands

# Business Goals



to equip everybody with reflectors



to equip all first response rescuers with detectors

# Business Model

- ❄️ reflectors pay for development and production of detectors
- ❄️ brands (Atomic, Arc'Teryx, Millet, Helly Hansen, Salomon, etc.) buy reflectors and subsidize detectors / rescuers...
- ❄️ what we need are sportspeople to purchase reflectors and subsidize detectors / rescuers

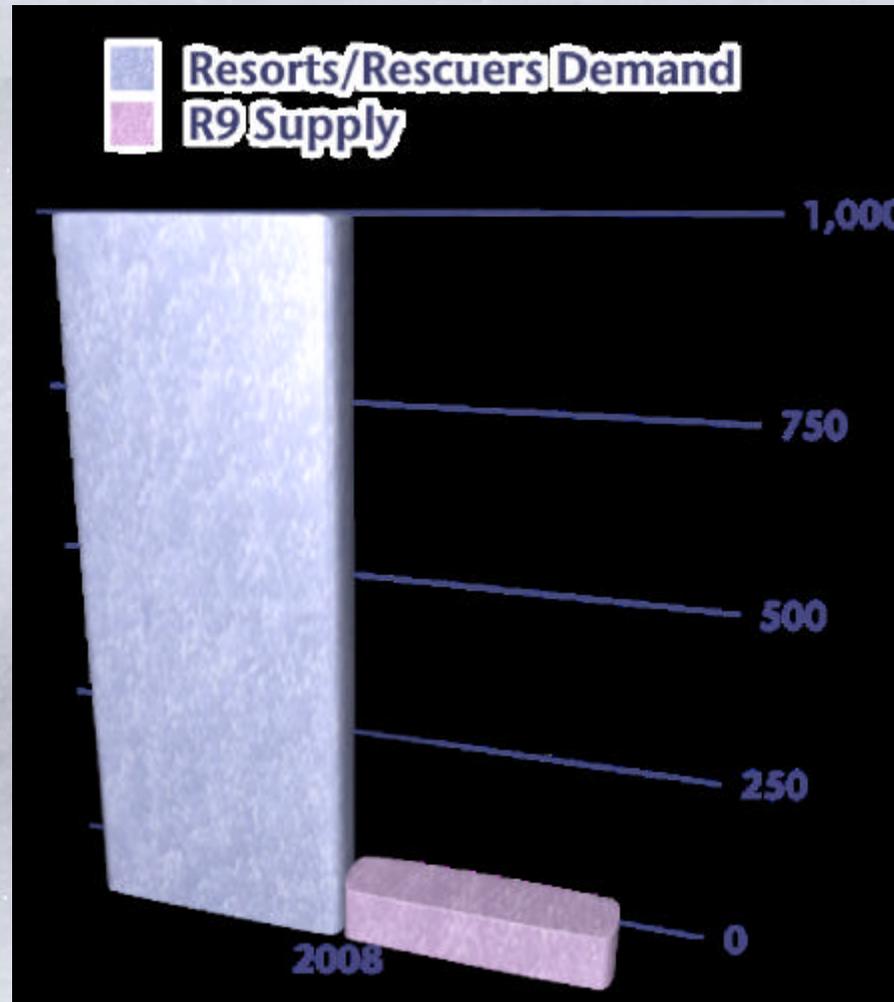
# Business Model

 when rescuers support the system this encourages...

 skiers, riders, alpinists to go to shops and use reflector - equipped gear

 more reflectors mean more efficient rescue system

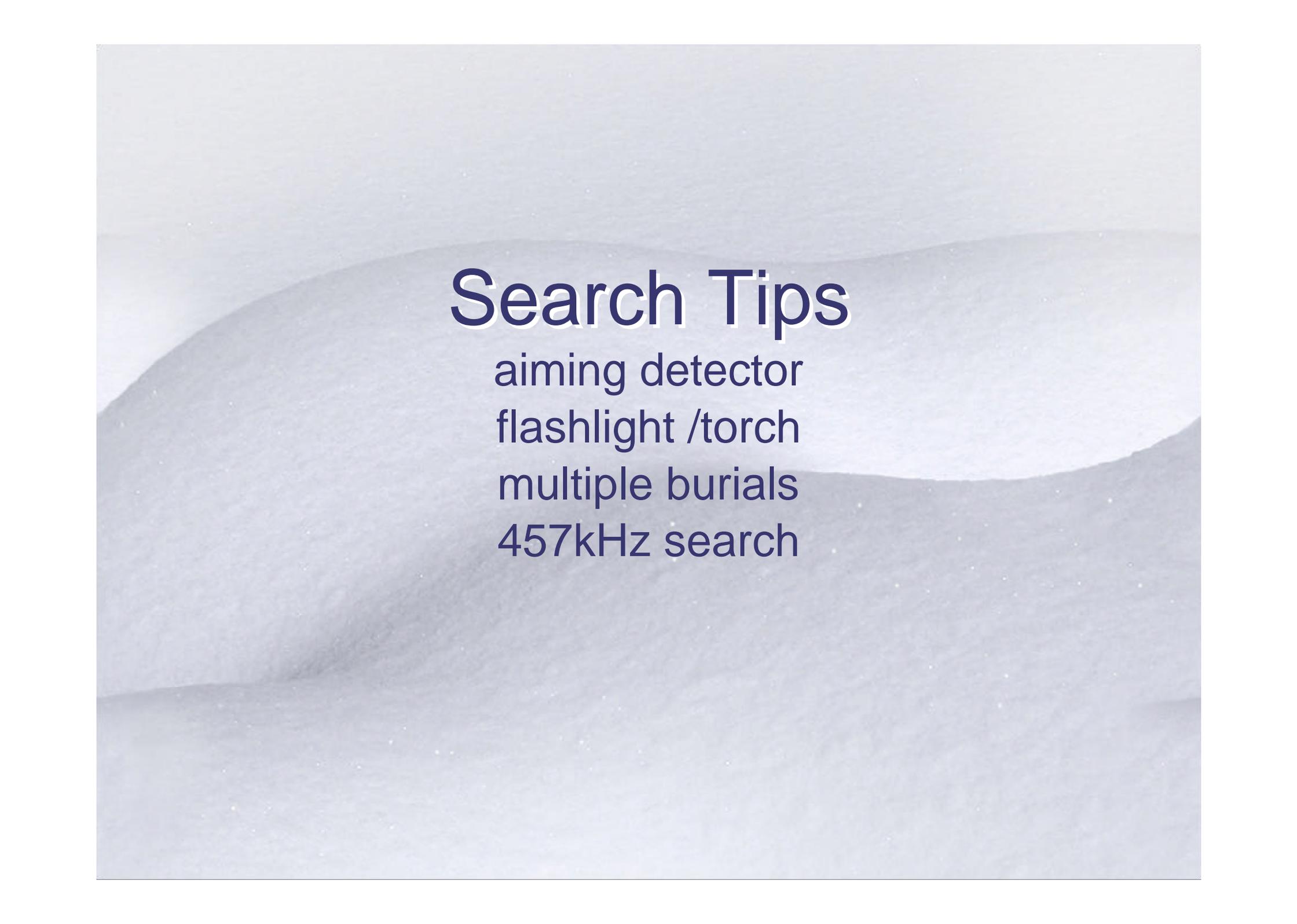
# R9 Demand & Supply



expect R9 supply increase in early 2009

# R9 Distribution

-  begin switching R9s for R8s this winter
-  supply R9s to high profile resorts/rescue organizations
-  supply resorts/rescue teams that can drive consumer demand
-  will take 2–3 winters



# Search Tips

aiming detector

flashlight /torch

multiple burials

457kHz search

# Aiming Detector



1st pass

# Aiming Detector



2nd pass

# Like a Flashlight



thoroughly search mounds and depressions

# Signal Search



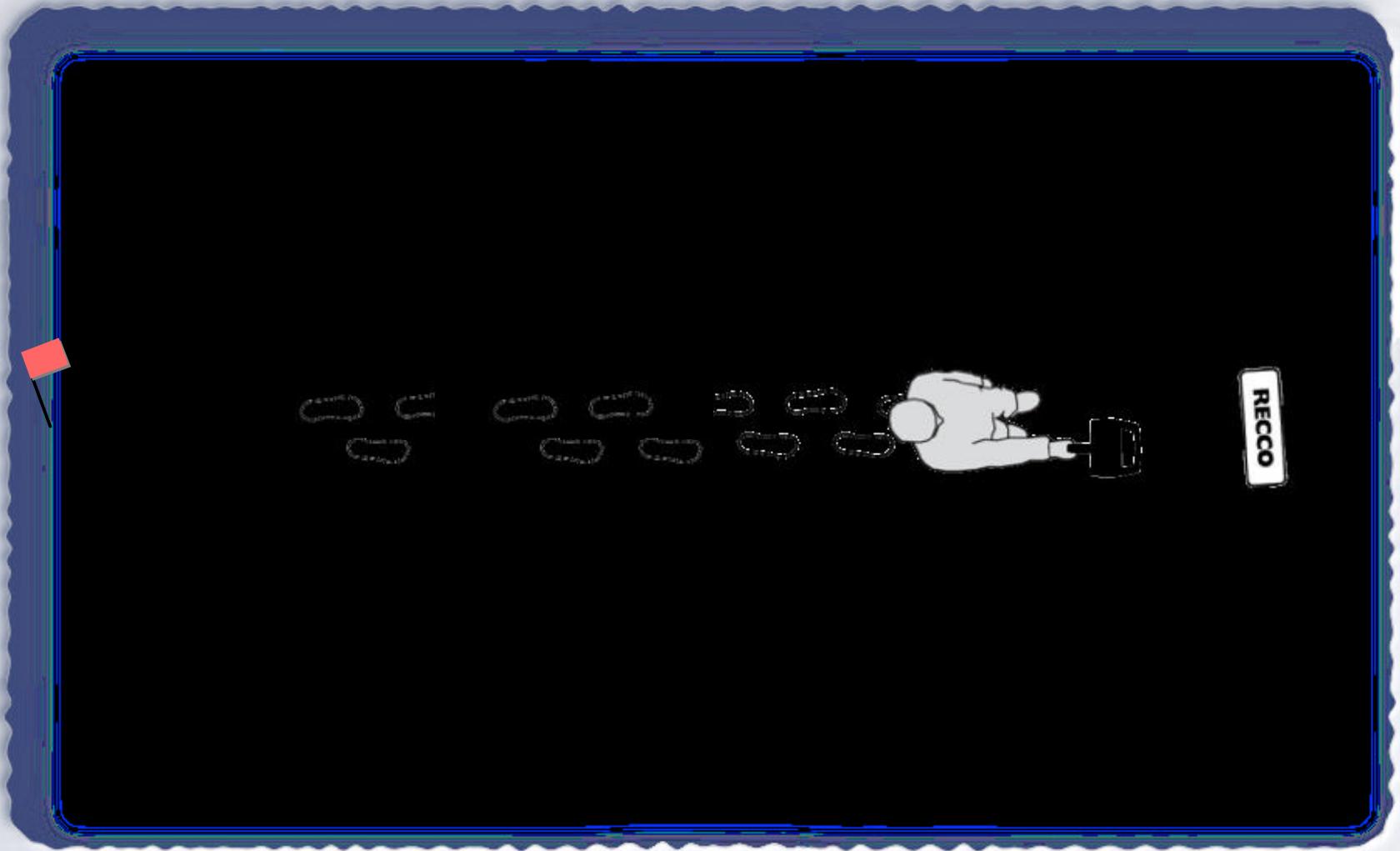
start at side of avalanche

# Multiple Burials



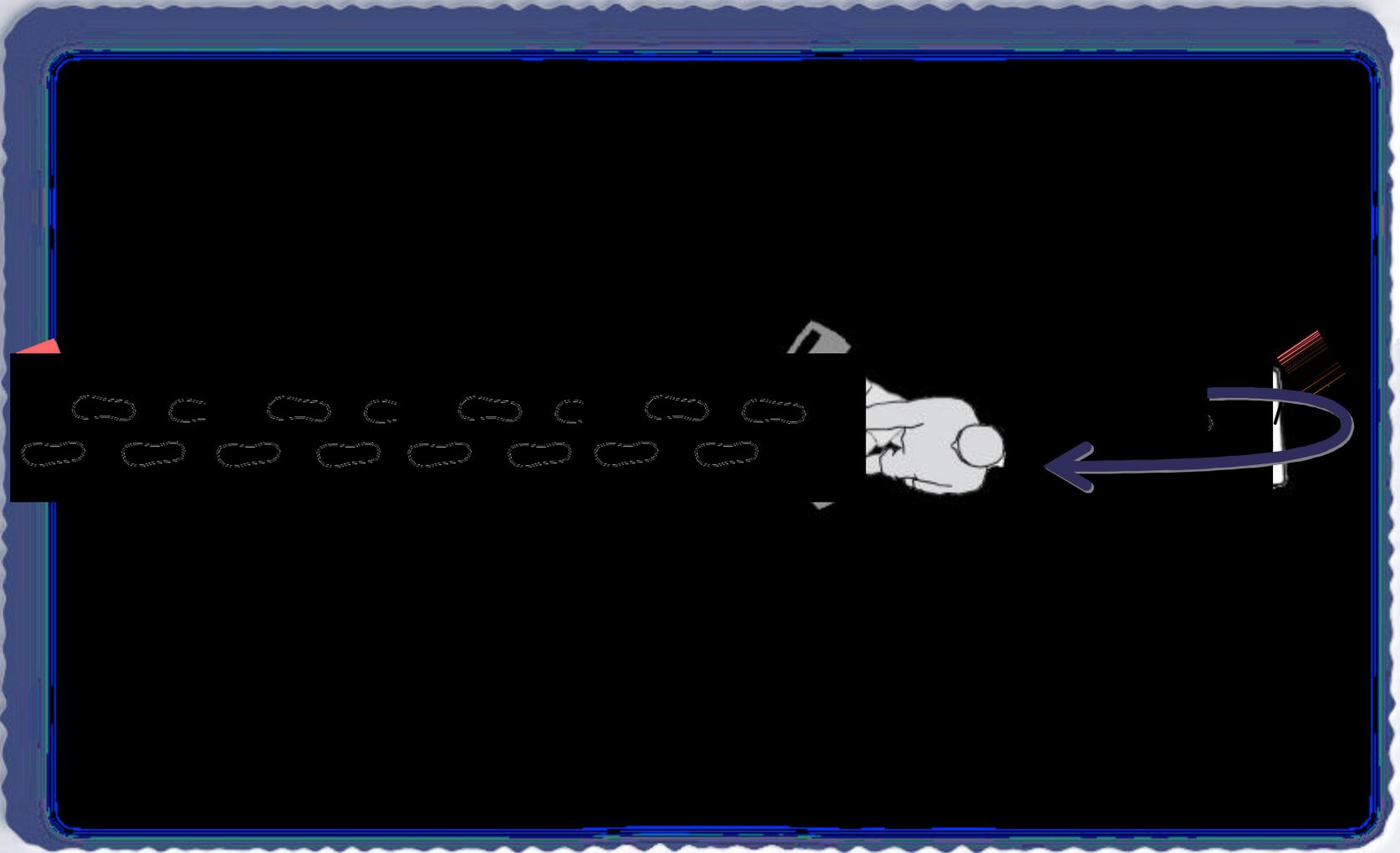
can miss near reflector because of orientation

# Multiple Burials



train and practice multiple burials

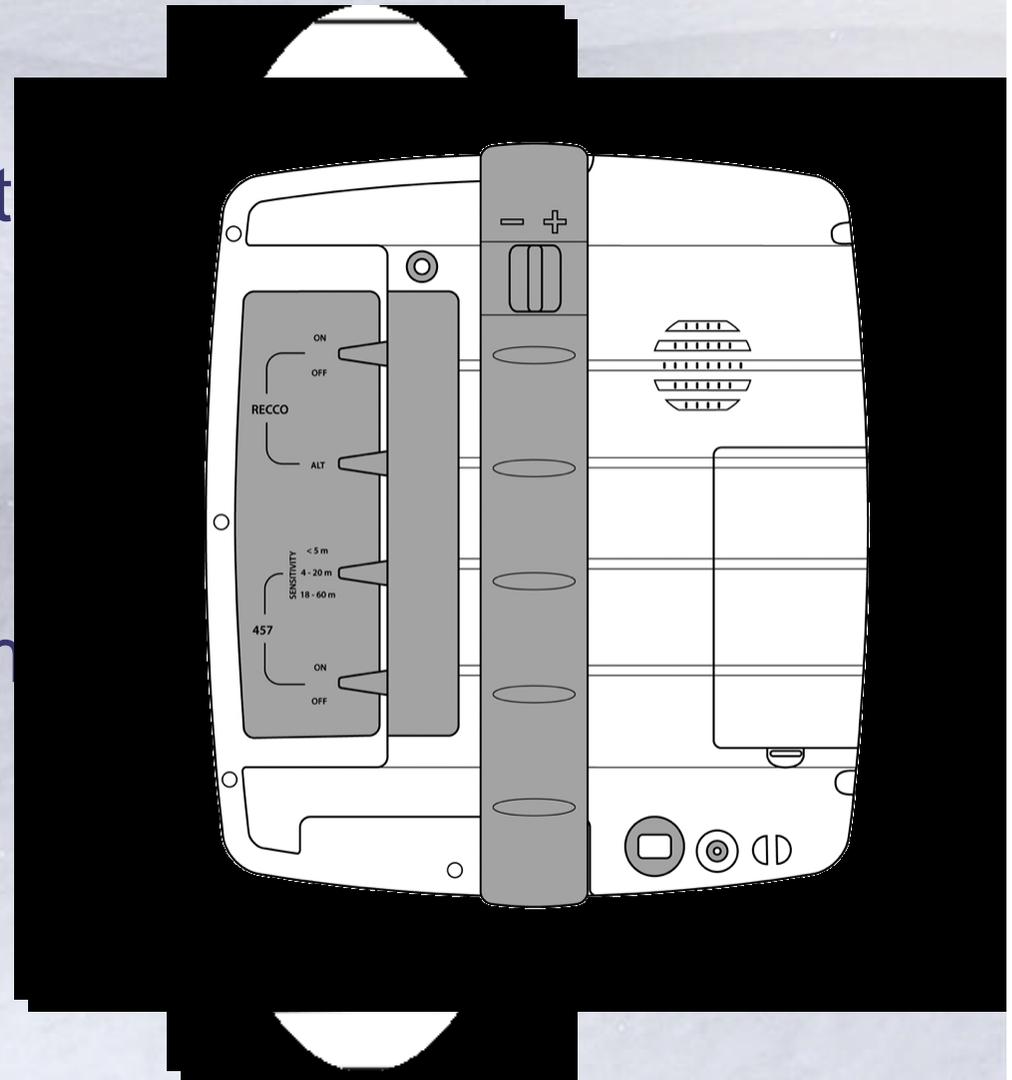
# Multiple Burials



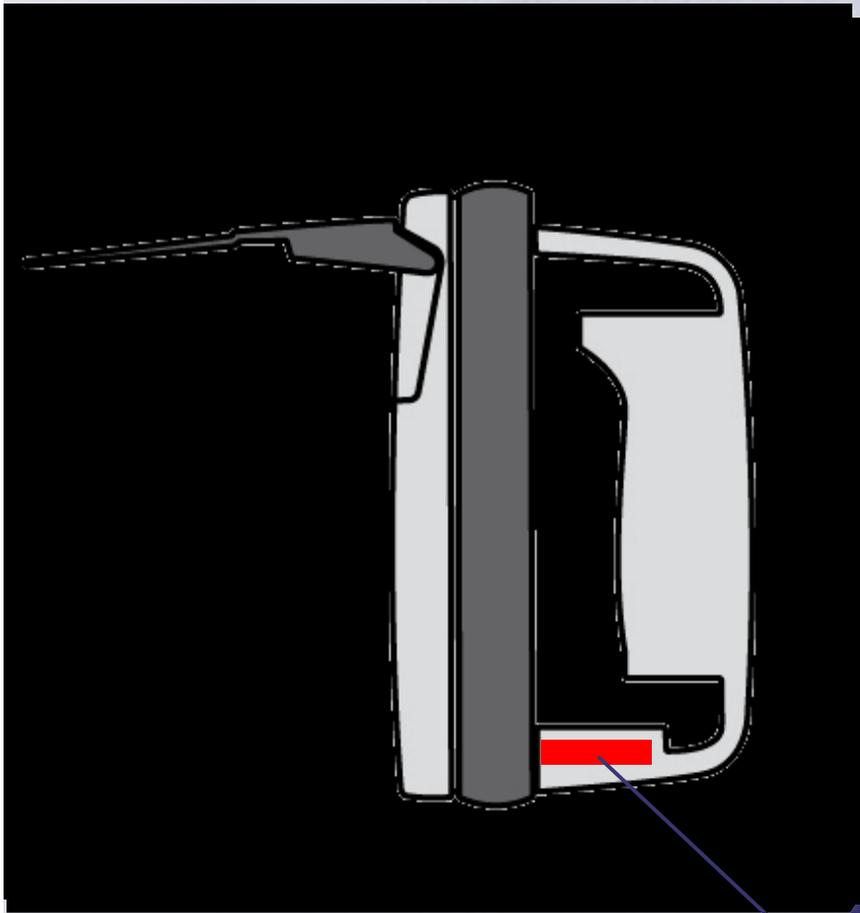
search back to where signal first heard

# 457 kHz Searching

- ❄ RECCO function must also be ON
- ❄ simple analog (acoustic) beacon
- ❄ search strip width 20m (same as RECCO)
- ❄ 3 volume settings



# 457 kHz Searching



- ❄ simple analog (acoustic) beacon

- ❄ when 457 signal detected – remember – R9 becomes a simple, beacon receiver

457kHz antenna

practice, practice,  
practice

