

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

The background of the slide is a photograph of a desert landscape with rolling sand dunes under a clear sky. The dunes are in the foreground and middle ground, creating a sense of depth. The sky is a pale blue.

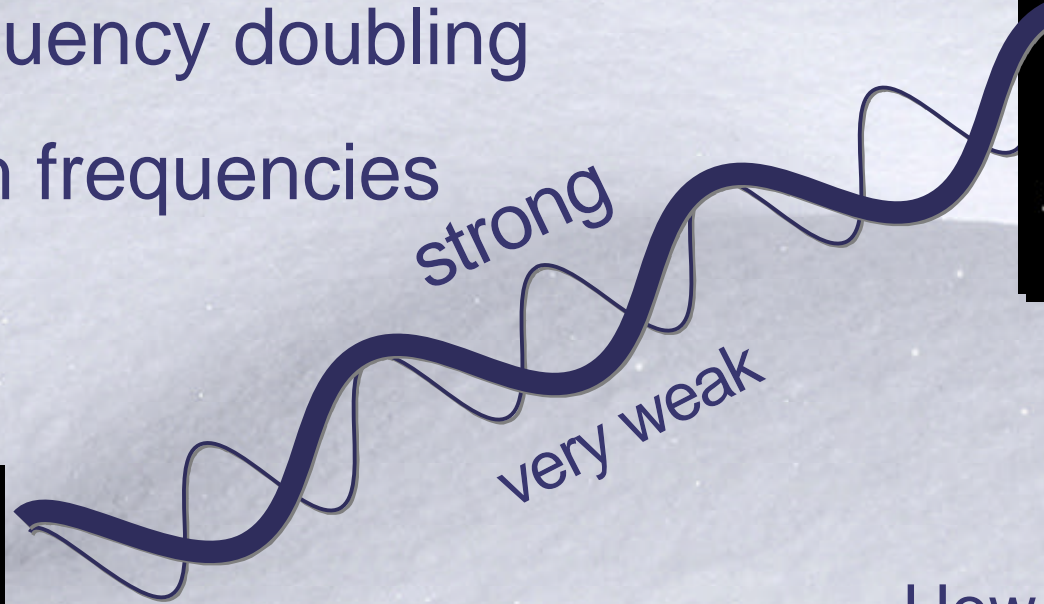
Technology

system

challenges
(differences in signal strength)

System

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



How strong?
How weak?

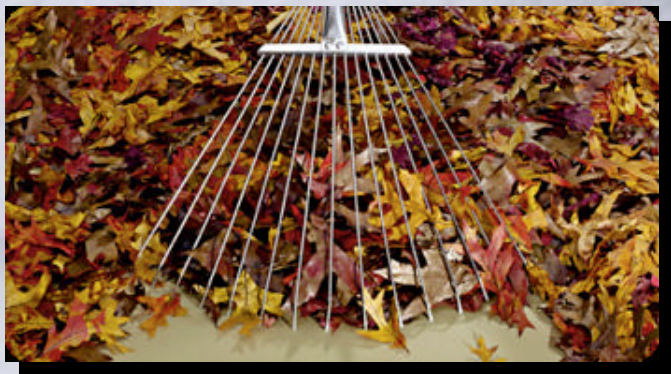
Relative Sound Signal Strength



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

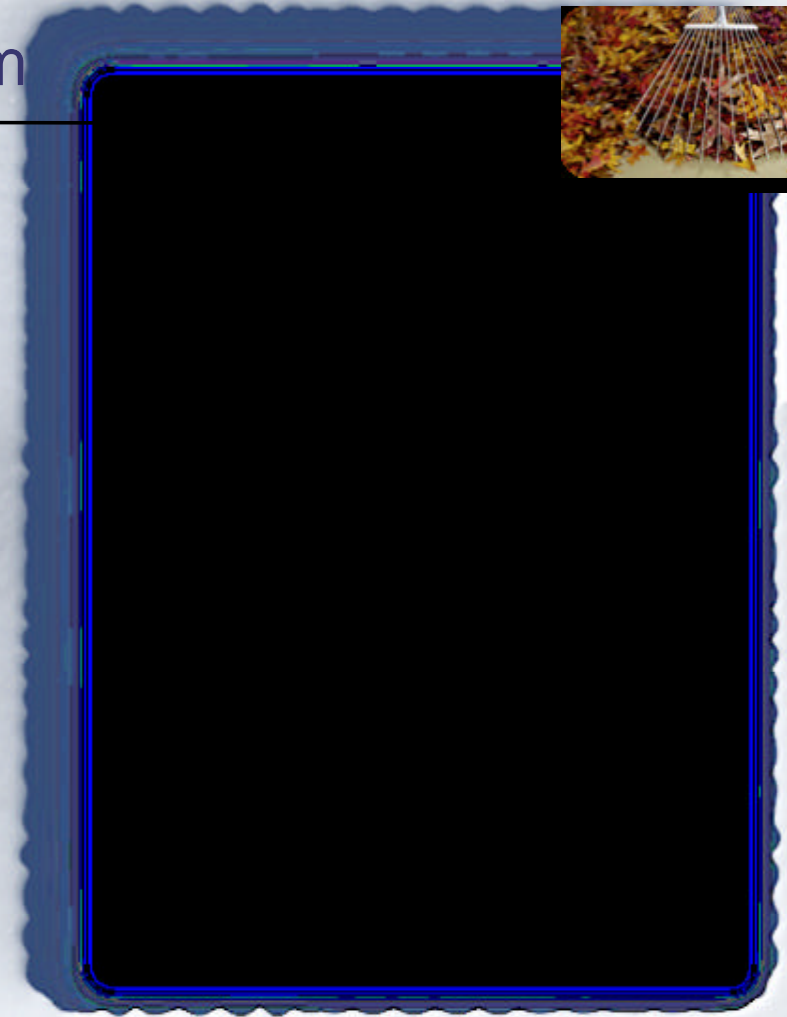


1000 m

receive



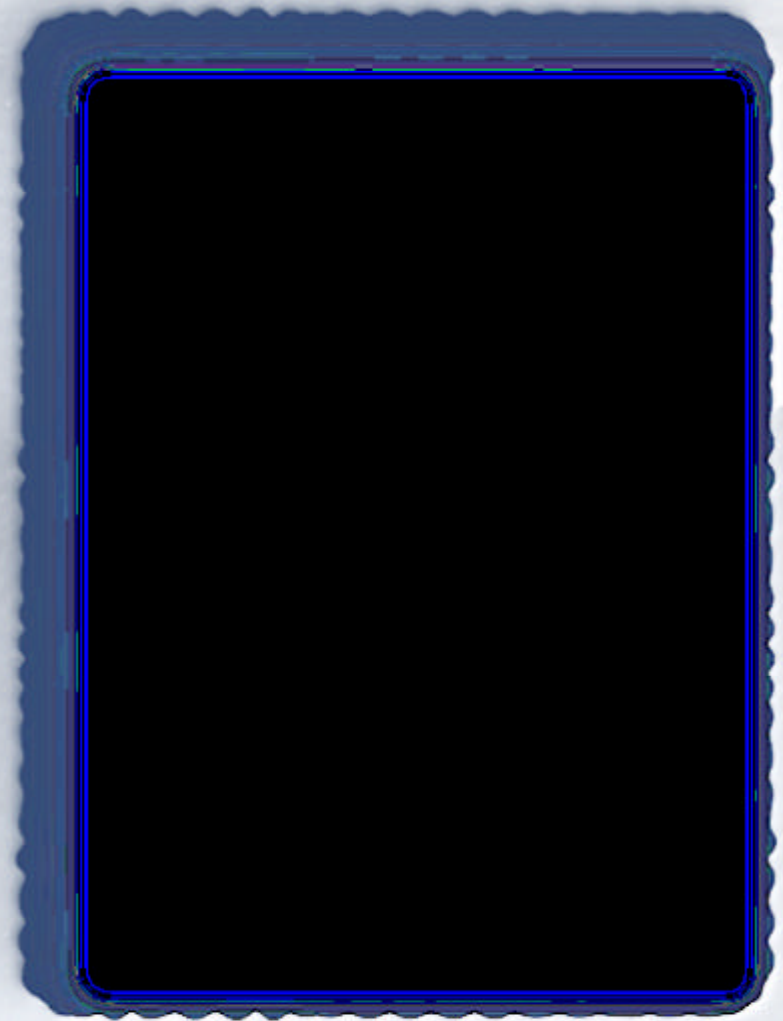
transmit and
receive antennas
had to be separated



Late 1970s

Detectors

✳ transmit and
receive antennas
closer together



1981

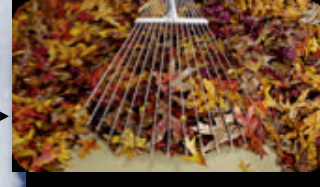
Detectors

transmit

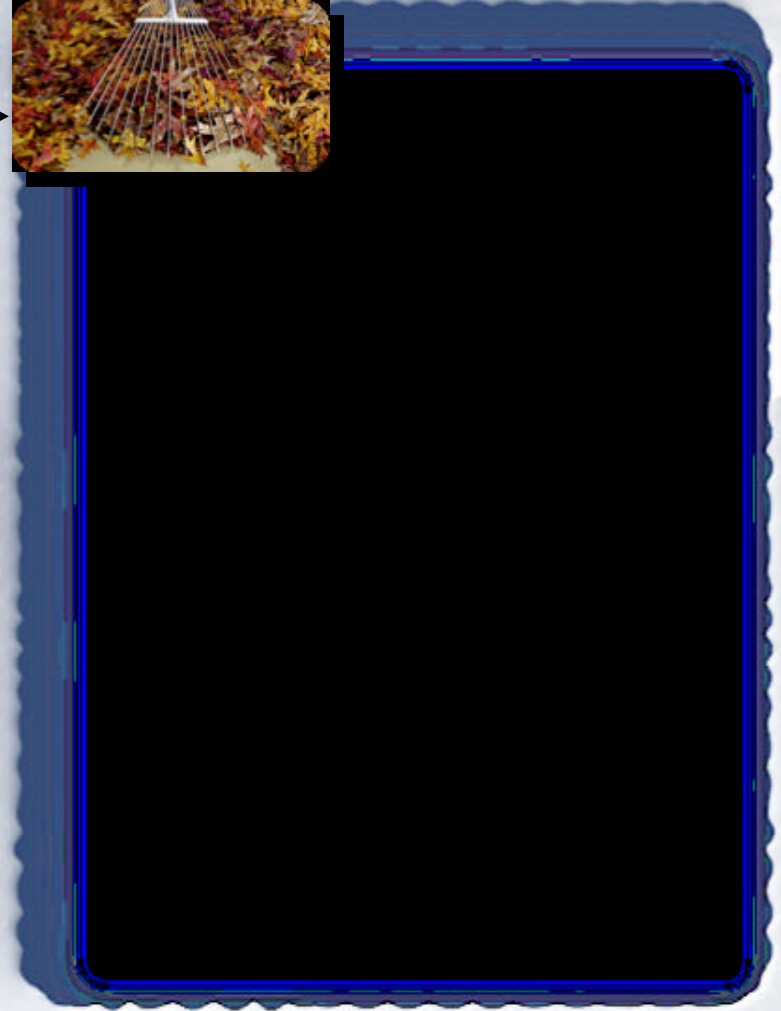


500 m

receive



transmit and
receive antennas
closer together



1983

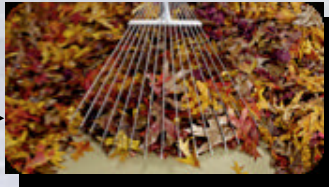
Detectors

transmit

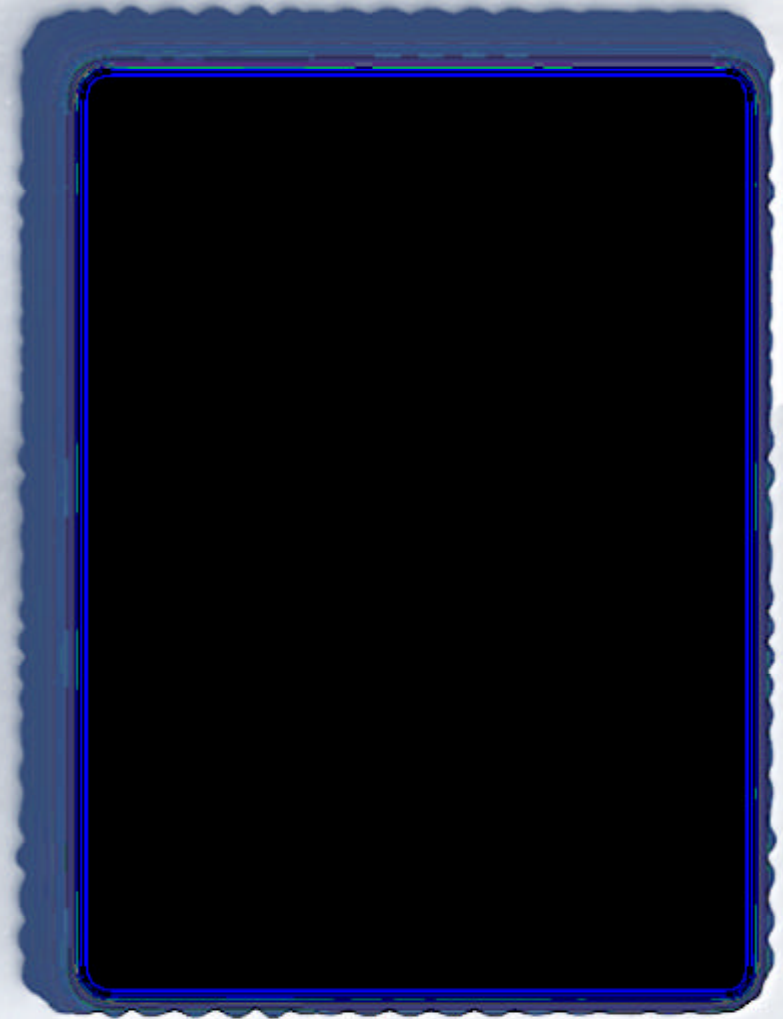


50m

receive



transmit and receive
antennas even closer
together

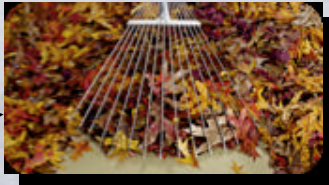


1997 – R5

Detectors

transmit

receive



10m



transmit and
receive antennas
very close together



caused serious
problems of
interference

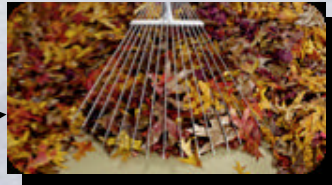


R9 – 2007

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

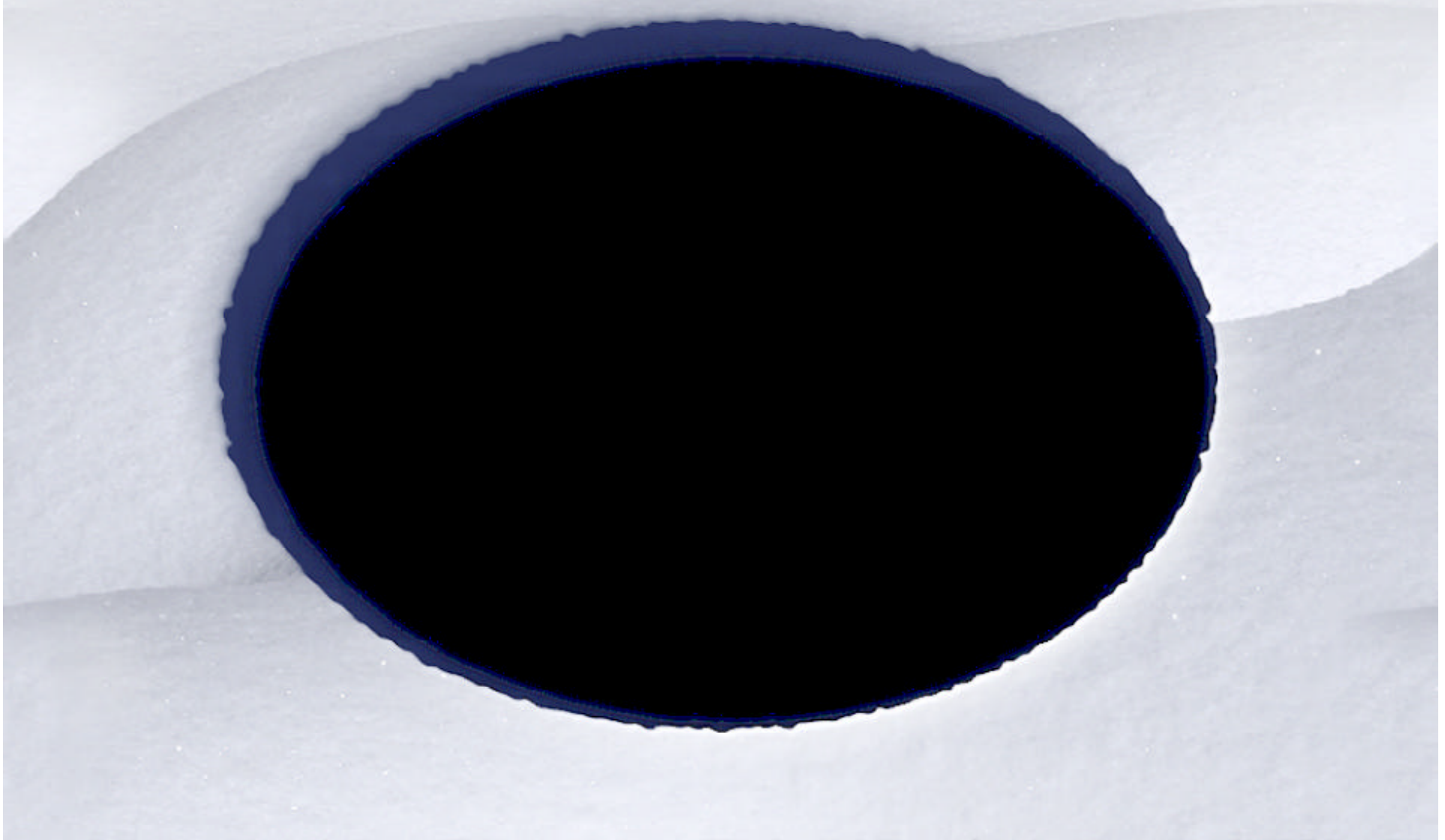


Distribution

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...

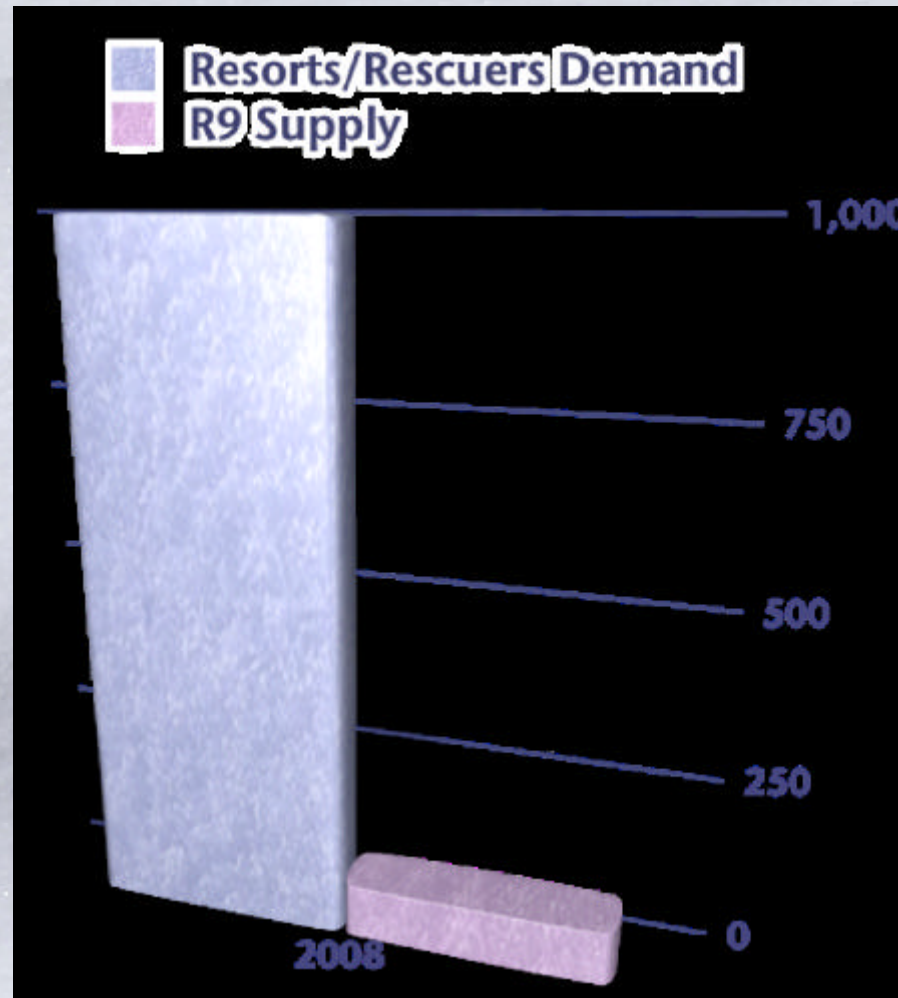


skiers, riders, alpinists to go to shops and use reflector - equipped gear



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

The background of the slide is a photograph of sand dunes under a clear sky. The dunes are rolling and have a soft, golden-brown color. The sky is a pale blue. The overall mood is calm and serene.

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



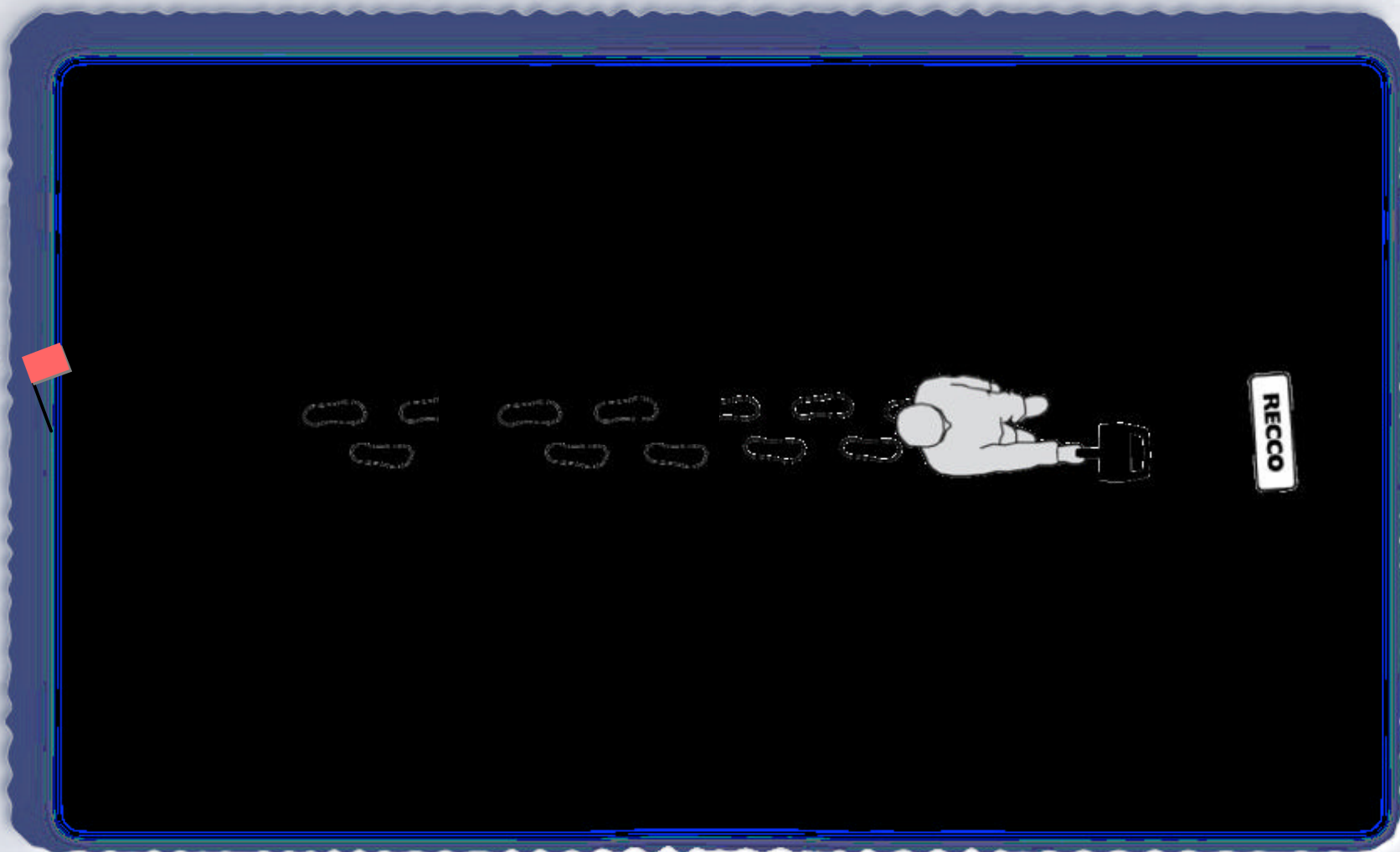
start at side of avalanche

Multiple Burials



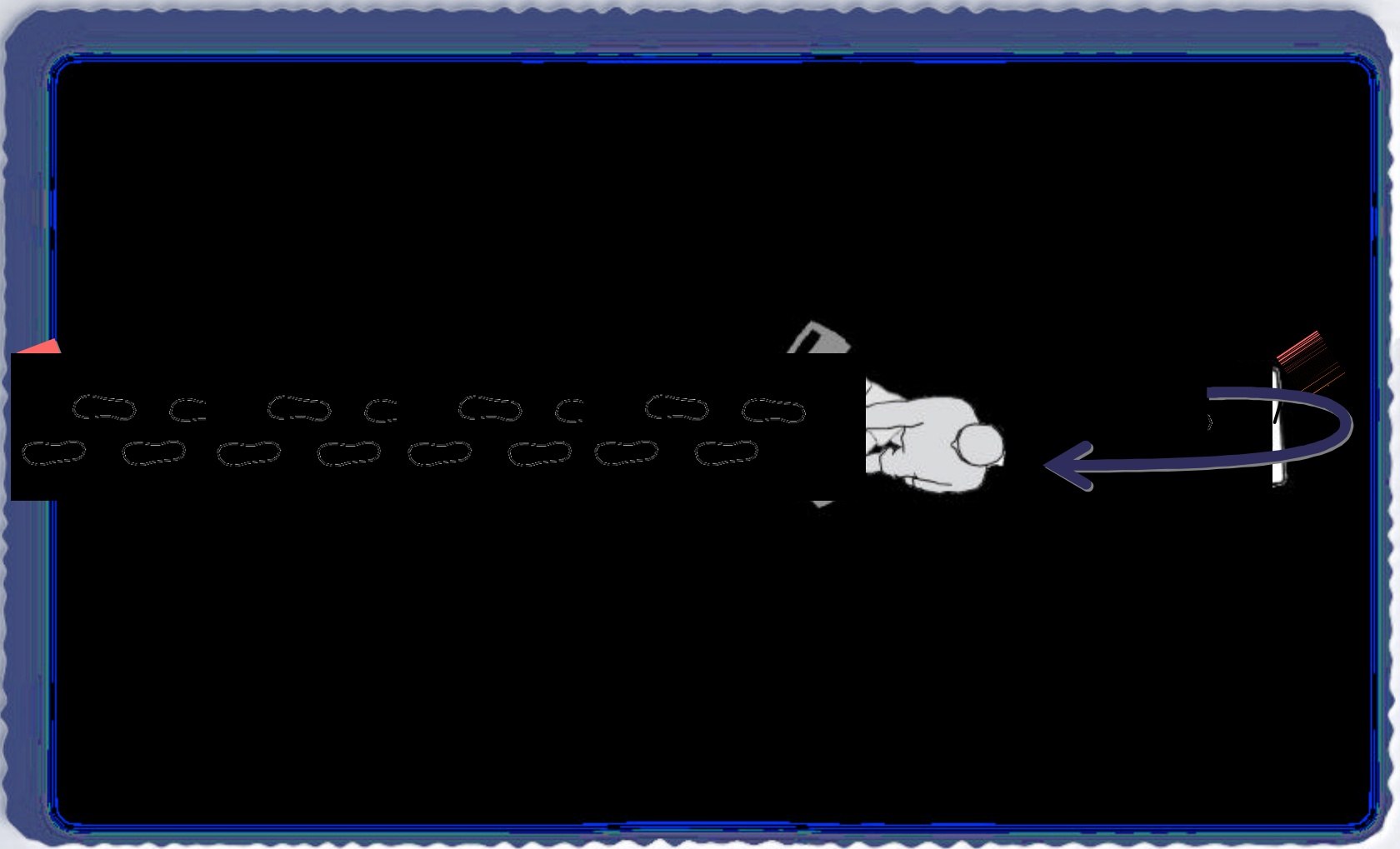
can miss near reflector because of orientation

Multiple Burials



train and practice multiple burials

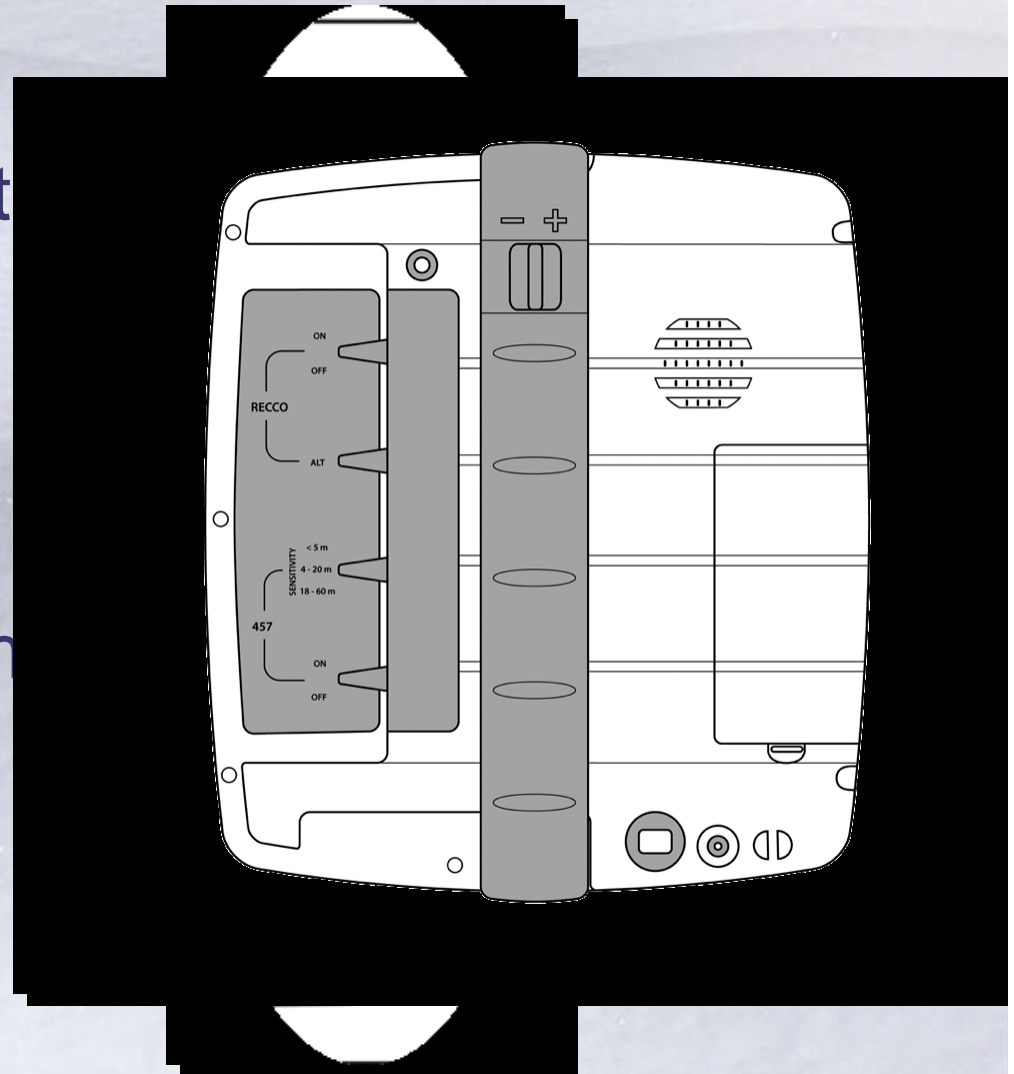
Multiple Burials



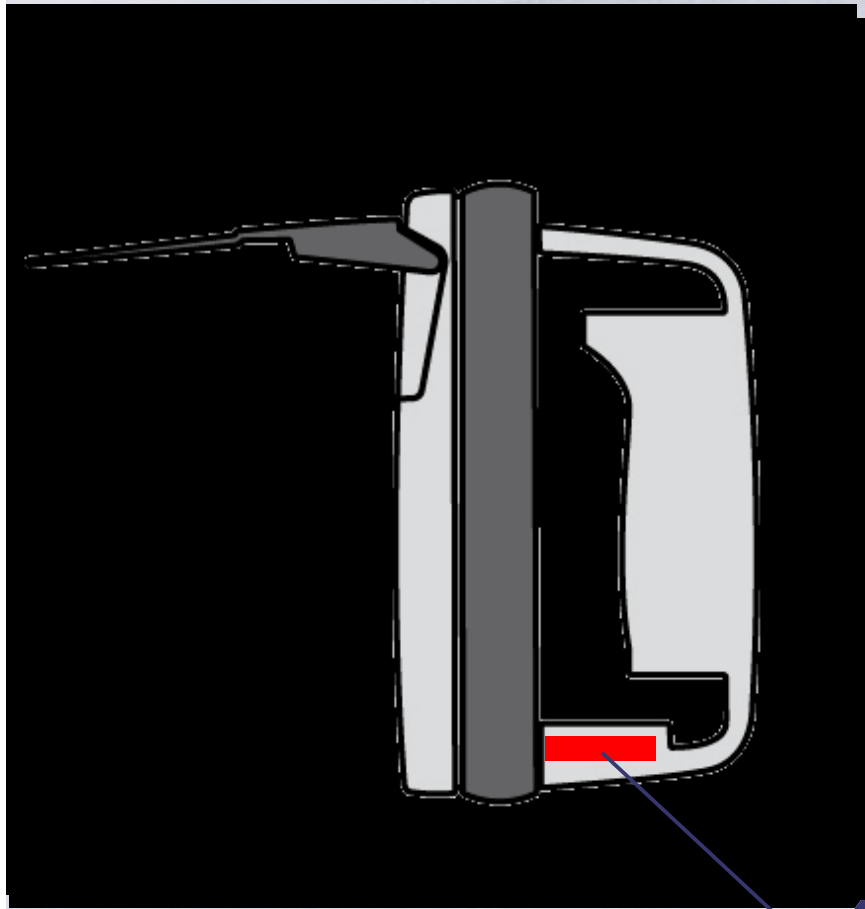
search back to where signal first heard

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

