Geo-Location

Situations
- Tactical
- RIT-Rescue
- Self-Rescue

System Types
- Location
- Tracking
- Navigation/Homing

Technologies
- RF
- Inertial
- Magnet (Compass)
- Pressure (Altitude)
- Acoustic
- Optical

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Who needs the information?
Who uses the tool?
What information is needed?
Why is information needed?
Accuracy and Range?
Tactical Situations

Who: Incident commander
What: Firefighter locations
Why: Accountability
Resource management
Situational awareness

Accuracy/Range: 3-10 ft / 100-1000 ft

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RIT-Rescue Situations

**Who:** Rapid intervention team/crew

**What:** Shortest path to firefighter

**Why:** Lost member

- Firefighter down
- Mayday

**Accuracy/Range:** 6 in / 20-150 ft
Self-Rescue Situations

**Who:** Firefighter

**What:** Shortest path to exit

**Why:** Disorientation, excessive heat, low air, potential collapse, evacuate order

**Accuracy/Range:** 2-3 ft / 20-150 ft
Tracking System

Position History
Navigation System

Shortest Path to Location
# Preferred Combinations

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Tactical</td>
<td>✓</td>
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<td>✗</td>
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“I know where he is”  “I can find him”
RIT-Rescue: Which Door?

Search Time is Critical
RIT-Rescue: Which Door?

Search Time is Critical
RIT-Rescue: Which Door?

Search Time is Critical
RIT-Rescue: Which Door?

Search Time is Critical
Technology: Which Door?
Technology: Office Complex

Search Time is Critical
## Preferred Combinations

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- **Location**: Tactical
- **Tracking**: RF
- **Navigation**: Inertial
Sensor Fusion

Multiple Technologies

Inertial + RF
- Inertial + GPS/Trilateration
- Inertial + RFID

Acoustic + Optical
- Pathfinder + thermal camera

Acoustic: Audible + Ultrasound
- PASS + Pathfinder
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Pathfinder

- Beacon: Omnidirectional transmitter
- Tracker: Directional receiver
- Technology: ultrasound
- Range: 120+ feet
- Search Time: 2-5 Minutes (typical)
Why Ultrasound?

- Not Affected by Fire Environment
- Reflected Waves: Locate Behind Obstacles, Around Corners
- Penetrates Small Openings: Locate Behind Doors, Under Debris
- No Blind Alleys
- Indicates Path
Pathfinder Firefighter Beacons

Stand-Alone Beacon

ISI Viking SCBA

Survivair/Sperian Panther SCBA
Pathfinder Firefighter Beacon

Survivair/Sperian Warrior
Pathfinder Aux & Exit Beacon
Pathfinder Trackers

- Audible Annunciator
- U/S Receiver
- LED Bargraph
- ISI EchoSeeker

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## Preferred Combinations w/Fusion

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Every Tool has its Limitations