



WHEN IT COMES TO YOUR SAFETY, WE GO TO THE EXTREME.

IT'S NOT JUST A LINE OF COMMUNICATION. IT'S A LIFELINE.



We understand you need mission critical devices that perform in the most extreme environments. Whether you're in a smoke-filled structure or listening to instructions over the high ambient noise of equipment or apparatus, you need to hear every command clearly. Fire doubles in size every 60 seconds and one second can make all the difference.

How do we develop a new generation of mission critical technology that is more intuitive and glove-friendly, significantly louder and clearer? So that every time you turn a knob or talk to incident command – particularly under stress – communicating becomes second nature.

Motorola designed the APX™ Extreme Series to meet the specific needs of firefighters. Our complete portfolio of ergonomically advanced, ultra-rugged radios and accessories are safe, easy and efficient to use.

DESIGNED TO HELP YOU DEAL WITH THE ROUTINE AND THE EXTREME.

No one knows the challenges of communicating better than those working a fire. That's why firefighters' needs drive our design process. A two-way radio or remote speaker microphone (RSM) that is difficult or distracting to use can cause you to take your mind off the mission.

Under calm conditions, a radio might be easy to operate. Under high-stress, performing anything complex becomes almost impossible. In a room of intense heat and heavy smoke, there isn't time to search for the push-to-talk button or risk a burn to

remove a glove to select a channel. What's more, high stress can "situationally disable" even the most experienced responder.¹

Our challenge at Motorola is to create solutions that help you succeed in both high and low stress situations and survive through the harshest of environments. Looking at how firefighters use their devices under stress is a science we pioneered, and this science of high velocity human factors plays a pivotal role in helping us develop the APX Extreme Series.

WE WALK IN YOUR BOOTS TO UNDERSTAND YOUR EXPERIENCE.



IMMERSION

We undertake an unusual approach to designing safe and best-in-class ergonomic products that shape the market and lead the industry. More than sketches in a studio, Motorola designers, researchers and engineers ride the apparatus, wear the gear, carry the equipment and go into the smoke-filled environments of live-fire training. This full immersion in understanding typical fire response behavior helps us understand how firefighters around the world use their radios and accessories.

OBSERVATION

Then we dig deeper and study how firefighters actually act and react during varying extremes and how this differs from their daily routine. Our team utilizes a multi-disciplinary approach to create products based on this behavior – integrating concepts from industrial design, ergonomics, cognitive psychology, physical and cultural anthropology and clinical psychology.

EXPLORATION

During our interactive design process, firefighters engage in participatory design sessions, off site, at their workplace and in the Motorola User-Centered Design Lab. A variety of exercises, like hands-on 3D modeling, lets them define and prioritize the features and physical characteristics they consider most important, such as glove-friendly controls and the location of displays.

PROTOTYPE

Data gathered during Immersion, Observation and Participatory Design activities is translated into many choices for the final design. We produce a number of prototypes and meet regularly with firefighters to gather feedback on their viability under realistic conditions. This is an important learning stage where key observations are made and turned into workable ideas and potential solutions.

EVALUATION

Finally, we test, refine and retest to make sure we've addressed firefighters' requests – from better tactility with heavy gloves to stiffer knobs that prevent accidental activation. Audio, voice and usability tests are just the beginning of refinements we make before you ever hold an APX device in your hand.

¹ Recent studies show that due to their demanding and high stress work environment, firefighters can temporarily experience functional limitations. These limitations or situational disabilities can have a detrimental effect on their ability to communicate to each other and to incident command.

TEAMWORK THAT WORKS TO CREATE A NEW GENERATION OF DEVICES.

We asked firefighters from Miami to Malaysia what they wanted in mission critical devices designed for their environments. Here's what they said mattered most:

A louder radio and remote speaker microphone for clear communications in high-noise situations.

Larger displays with larger fonts that can be viewed looking down or at an angle.

Being clearly understood while talking from and in extreme noise environments.

Glove-friendly controls that are big, recognizable and easy to use.

Compact multiband radios that are small and light.

No compromises on the quality, durability and reliability they expect from Motorola.

When firefighters said they wanted a larger display and exaggerated controls but in a smaller unit, we viewed it as the ideal challenge. The APX Extreme Series brings together their priorities with our 80-plus years of experience in ergonomics, design and technology for public safety. It is the culmination of cross-disciplines and user input.

Working together with first responders around the world, we have designed and delivered the first mission critical two-way radios and accessories for personnel safety in extreme environments.



APX EXTREME SERIES: EVERYTHING FIREFIGHTERS ASKED FOR.

At first glance, the APX 7000XE, APX 6000XE and APX XE RSM are unquestionably rugged and mission-ready. Yet some of their most remarkable aspects come from questioning traditional thinking and conventional design.

Every feature and function of the APX Extreme Series is designed with your safety in mind: from best-in-class audio, to industry-leading ergonomics, to noise-canceling software that ensures every word is heard in the loudest environments. It's innovations like these that make these radios and remote speaker microphones an ideal fit for the fire service.

EXAGGERATED CONTROL TOP

Firefighters told us it was difficult to access one knob without accidentally adjusting the other. Drawing on the innovative T-grip design of the APX 7000, the APX 7000XE and APX 6000XE radios have significantly larger and wider control tops specifically for gloved hands. The APX XE RSM sports a unique asymmetrical shape so it can be operated without looking. All devices have larger knobs for volume and channel selection, with more room between them to increase access, particularly with gloved hands.

GREATER DEXTERITY WITH GLOVES

Firefighters often operate their radios by touch alone, mentally counting "clicks" while changing channels. Realizing this, we distinguished the APX Extreme Series knobs by tactility or touch. Not only are the radio volume knobs angled, their continuous high-resistance "feel" is purposely different than the sharp ratcheting 'clicks' on the channel knobs. Rather than a traditional knob or button for volume, we designed a toggle switch on the RSM with a different tactility, enabling responders to locate and use it quickly by "feel" even with gloves on.

50% LOUDER AND CLEARER

Volume is the most frequently-used control on any radio and the APX 7000XE and APX XE RSM honor this fact. They are 50% louder than traditional two-way radios and accessories without distorting or degrading communication. Now firefighters can hear clean, clear sound from virtually any angle. With a powerful 1 watt speaker, their voices won't wash out from background noise, whether the high-pitched alarm on an SCBA or the whine of power saws on the fireground.

EXTREME AUDIO PROFILE

Reducing background noise is essential for communications and APX Extreme Series radios handle this skillfully with their Extreme Audio Profile. A new software algorithm improves communications whenever an excessive amount of background noise is prevalent – such as PASS alarms sounding, exhaust fans blasting or diesel engines running. What's more, the APX Extreme Series radios and XE RSM features intelligent 2-microphone noise reduction software and the latest AMBE+2 vocoder to dynamically adjust for changing high noise environments.

ENLARGED TOP DISPLAY

We placed a larger display on top of the APX 7000XE and APX 6000XE radios, angled it, increased the font size for easier viewing. The top display is so large, it's double the size of the display on the APX 7000 portable. Now firefighters can see the radio status and channel/zone information at a glance, without removing the radio from their turnout gear.

SHIELDED PUSH-TO-TALK (PTT) BUTTON

Using a thumb, multiple fingers or gloved hand, the exaggerated PTT button on the APX 7000XE and APX 6000XE makes communicating even easier. Ramps on either side help firefighters locate the PTT button by "feel" alone, while a green ring around it provides an extra visual cue, especially in low light. If the radio is dropped, the ramps help prevent accidental activation. We also designed the XE RSM housing with an asymmetrical shape to make the PTT more identifiable by feel, even with heavy gloves on.

X-LARGE EMERGENCY BUTTON

We pioneered the emergency button at the base of the antenna so firefighters could quickly locate it. Now we've improved our innovation, making this lifesaving button on the APX Extreme Series radios and XE RSM the largest one available, yet well-protected against accidental activation.

BETTER, SURER GRIP

Minimizing distractions and maximizing control is critical on the fireground. So when firefighters asked us for a better, firmer grip of the device, we added rubber nibs on the back of our APX 7000XE model 1 radios to secure them from slipping. This "grip zone" improves coordination and control.

MULTIBAND INTEROPERABILITY

Meeting public safety specifications for multi-agency collaboration is key to a timely response. The APX 7000XE operates in any two bands seamlessly so firefighters can reduce the equipment they carry and be confident their communications are truly interoperable when they need it most.

APX EXTREME SERIES: TOUGHNESS RUNS IN THE FAMILY

APX 7000XE P25 PORTABLE RADIO – Extreme ergonomics and innovative technology in a stand-out multiband radio made for seamless interoperability. Combined with best-in-class audio designed specifically for extremely loud environments.

APX 6000XE P25 PORTABLE RADIO – Extreme ergonomics, excellent audio and advanced features in a rugged, single band radio. Choice of three models with full front display and front panel programming to instantly reprogram radios on site.

APX XE REMOTE SPEAKER MICROPHONE (RSM) – The ideal complement to any APX portable, with extreme ergonomics, glove-friendly controls, protected emergency button, large volume toggle and emergency-activated strobe light. The first accessory with dual microphones for exceptional noise canceling and a large speaker for the loudest, clearest accessory audio available.



YOU DESERVE SOLUTIONS DESIGNED TO KEEP YOU SAFE.

You told us what you needed and we listened. You want rugged, designed-for-how-you-do-business, two-way radios and accessories that stand up in the most extreme situations – as fire burns, smoke pours and multiple PASS alerts scream.

The APX Extreme Series is about using our knowledge, design leadership and technological innovations to collaborate and create solutions so firefighter-focused, they're unlike any you've ever used. Yet so intuitive, they're everything you expect communication devices to be.

By listening, observing and inventing products like the APX 7000XE, APX 6000XE and APX XE RSM, you can focus on the task instead of the technology – and focus your time on fighting fires rather than fighting

with communication devices. Together we are creating complete solutions that are second nature to use, with safety and reliability that are second to none.

TECHNOLOGY THAT'S SECOND NATURE™

The APX Extreme Series is part of the Next Generation Public Safety Mission Critical Portfolio of products that offer seamless connectivity between first responders. Motorola puts real-time information in the hands of fire and emergency service personnel to provide better information that enables better decisions for better outcomes. It's Technology That's Second Nature.

Additional information and resources on the APX 7000XE, APX 6000XE and APX XE RSM, including product information, 360-degree product tours, brochures and white papers are available on the APX product website at www.motorolasolutions.com/apx

MOTOTROLA POSITION PAPER

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