THE EVOLUTION OF RADIO COMMUNICATIONS IN PUBLIC SAFETY

MOTOROLA SOLUTIONS

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RADIO HAS COME A LONG WAY

In the generations since its discovery in the 1880s, radio technology has powered some of the most pivotal moments in history. Radio transformed the way we consume information with the first news broadcasts in 1920. It was instrumental in WWII, when the iconic "walkie talkie" helped Allied troops communicate on the front lines. It was the reason we could hear, "that's one small step for man, one giant leap for mankind," live as we saw Neil Armstrong touch down on the moon from more than 200,000 miles away.

"that's one small step for man, one giant leap for mankind"

IF ONLY HEINRICH HERTZ COULD SEE IT NOW.

THE INVENTOR, WHO IN 1886 WAS THE FIRST PERSON TO BROADCAST AND RECEIVE RADIO WAVES, FAMOUSLY QUIPPED, "I DO NOT THINK THAT THE WIRELESS WAVES I HAVE DISCOVERED WILL HAVE ANY PRACTICAL APPLICATION." IN REALITY, HIS DISCOVERY HELPED CHANGE THE VERY NATURE OF COMMUNICATIONS.

Since 1886, Land Mobile Radio (LMR) networks have revolutionized radio communications at the push of a button. As early as 1933, police departments began relying on LMR communications to stay connected. The Bayonne, New Jersey police department is widely credited as the first to operate an LMR system.

From the late 1930s to the 1970s, devices were added to vehicles, transistors enabled radios to shrink in size and data capabilities were incorporated. By 1972, Motorola's mobile data radio system was being used in public safety vehicles to transmit and receive data from dispatch computers.

The 1990s and 2000s saw the introduction of narrowband digital public safety radio and high-speed data systems. And in 2008, public safety communications were transformed with the launch of the APX family of Project 25 radios – custom-designed to meet the unique needs of first responders.

Today, LMR is an indispensable tool for public safety organizations and agencies. As other communications technologies have been introduced – from early cellular communications in the 1980s to WiFi and LTE in the 1990s and 2000s – radio has continued to be the communication tool of choice for mission-critical communications.

That's because radio offers the fastest and most reliable means to communicate. With modern push-to-talk (PTT) technology, first responders can talk instantly – without the dialing, routing, ringing and answering steps of a traditional phone call. And without the typing or dictating and sending of text messages. With no distractions to get in the way, PTT is what professionals use to get the job done right, when getting it done right the first time is critical.

LOOKING FORWARD, RADIO CONTINUES TO EVOLVE, ADDING POWERFUL FEATURES AND APPLICATIONS THAT HERTZ COULD ONLY HAVE DREAMED OF.

AT THE FOREFRONT OF RADIO INNOVATION

1886 Heinrich Rudolf Hertz becomes the first person in history to broadcast and receive radio waves

1928 Police departments begin using AM radio channels to broadcast information to the radios in patrol cars

1930 Galvin Manufacturing Corporation (later renamed Motorola) begins selling car radio receivers to police departments and municipalities

1933 Bayonne, New Jersey Police Department is the first to operate a land mobile radio (LMR) system

1936 Motorola introduces the Motorola Police Cruiser radio receiver, a one-way car radio designed to receive police broadcasts

1943 Galvin Manufacturing Corporation debuts the world's first FM portable two-way radio – the SCR300 "walkie talkie" backpack – for the U.S. Army

1958 Motorola introduces the Motrac radio, the world's first vehicular two-way radio

1972 Motorola's MODAT mobile data radio system allows users in vehicles to transmit and receive data from dispatch computers

1977 Motorola's Digital Voice Protection (DVP) system is the first digital encryption technology to provide two-way radio users with a high degree of voice communications privacy

1983 The world's first commercial handheld cellular phone, the Motorola DynaTAC, receives approval from the U.S. Federal Communications Commission

1991 Motorola's ASTRO two-way radio system is the world's first narrowband digital public safety radio system

2000 Motorola tests the world's first 700 MHz wideband high-speed data system for public safety users, enabling advanced mission-critical solutions

2008 The APX family of Project 25 multi-band two-way radios is launched. Designed with first responder input, the APX radios work in the 700/800 MHz and VHF bands, and have custom-designed microphones, integrated GPS, and text messaging

2012 Motorola Solutions introduces the LEX700 mission critical handheld – world's first handheld public safety LTE device

WHAT'S NEXT?

PURPOSE-BUILT DEVICES

PURPOSE-BUILT DEVICES ARE THE CORNERSTONE OF LMR. IN THE REALM OF PUBLIC SAFETY, MINUTES OR EVEN SECONDS CAN BE THE DIFFERENCE BETWEEN LIFE AND DEATH.

Having the right device, tailor-designed to the job at hand – whether it's a police officer under fire or a firefighter wearing heavy-duty gloves – is critical.

That's why today's devices have undergone multiple generations of development and user experience testing – ensuring they provide a number of functions integral to mission critical operations. Dedicated push-to-talk buttons, rugged construction, advanced noise cancellation and high-capacity batteries are all key features that have been incorporated into LMR devices with the customer in mind.

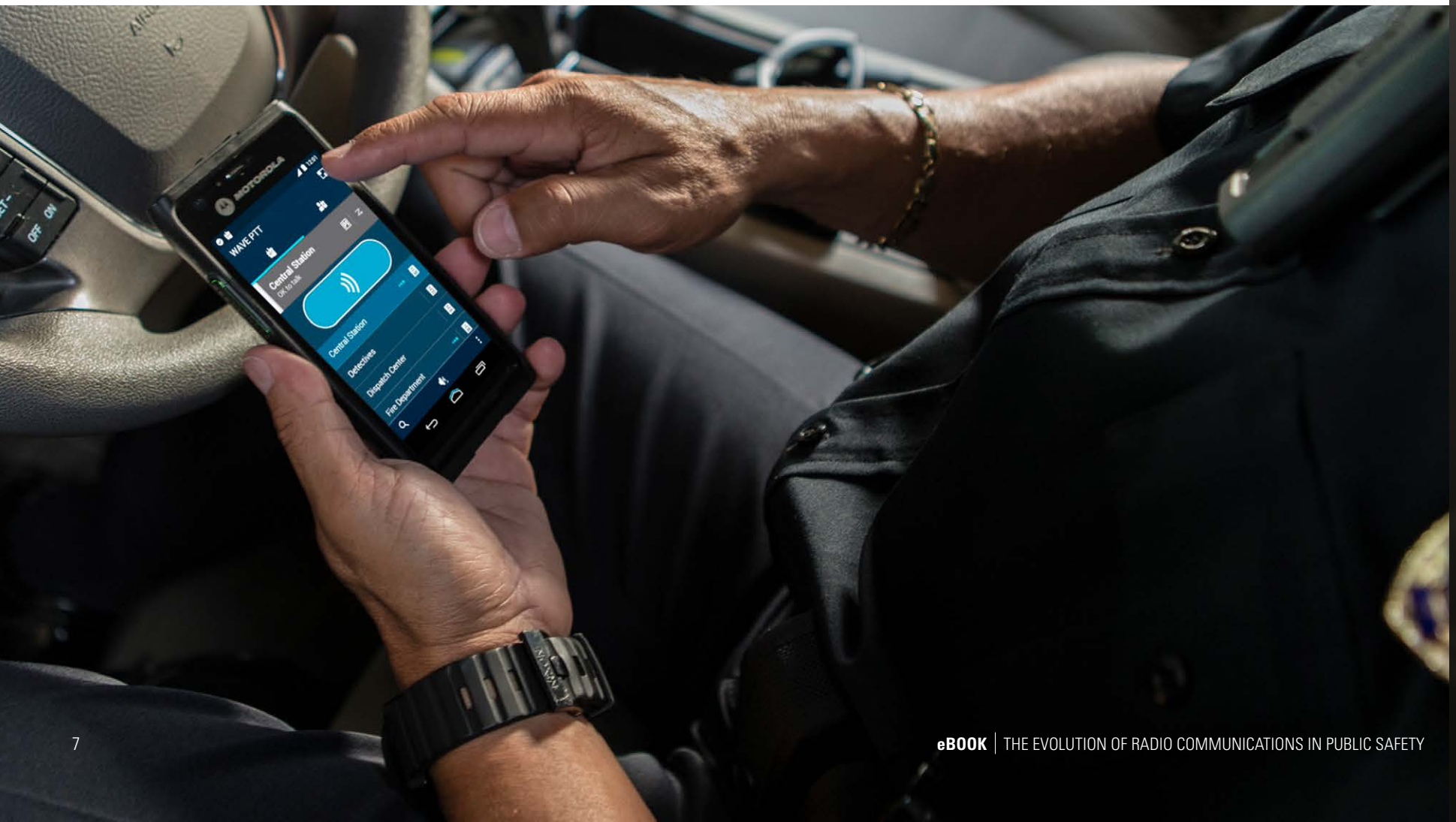
The radio of the future needs to build upon this foundation. It can't sacrifice the purpose-built features and hallmarked ruggedness that public safety personnel rely on in order to add new, sophisticated features. Whether it's environments with zero visibility, uniforms that include heavy gloves and protective equipment or situations of high stress, future mission critical radios must be designed to be easy to use, to let individuals focus on the work and the task at hand, knowing that they are connected at all times.

NATURAL USER INTERFACES

EVERY DAY, THE PUBLIC INTERACTS WITH AND MANAGES DATA USING TOUCHSCREENS AND VOICE CONTROLS.

The radio of the future will integrate the natural user interfaces the public has become accustomed to with the rugged devices public safety officers rely on. And much like those devices, the interface must be hardened to meet the unique needs of the police officers, firefighters and other first responders.

Touchscreens will be able to withstand the worst of conditions and still be able to be used by first responders wearing heavy-duty equipment. Displays will be readable whether indoors or outdoors. Voice commands will be understood the first time – without getting confused or muddled. The radio of the future must be effortless to use, regardless of the situation.



UNLIMITED CONNECTIVITY

PUBLIC SAFETY PERSONNEL RELY ON THEIR RADIOS TO WORK – NO MATTER WHERE THEY GO.

P25 networks today provide extremely reliable coverage, but can experience dead spots in rural areas or deep within buildings. First responders need unbroken communications, and the radio of the future will provide that.

Much like cellular devices that transition back and forth between WiFi and their network, the radio of the future will seamlessly move between P25, WiFi and other broadband networks to ensure that public safety officers are always connected – no interruptions.

And because the radio of the future will expand into new networks, it will be increasingly secure. Enhanced encryption will ensure all voice communications and data transmission remains private and secure.

SIMPLIFIED OWNERSHIP

TIME IS A CRITICAL ASSET. YET TODAY, PUBLIC SAFETY AGENCIES ARE SPENDING VALUABLE TIME AND RESOURCES ON MANAGING THEIR RADIO NETWORK – FROM INITIAL PROVISIONING TO CONTINUED MAINTENANCE AND UPDATES.

The radio of the future will simplify management and maintenance – saving time and resources for organizations. From initial pre-programming, remote updating and continued security patching the radio of the future will make it easier for agencies to manage their networks, keep them secure and ensure they stay up-to-date.

HAND-HELD INTELLIGENCE

IMAGINE DISPATCHERS BEING ABLE TO SHARE THE PICTURE OF A MISSING CHILD, FIRST RESPONDERS HAVING ACCESS TO A MAP OF AN INCIDENT, OR OFFICERS BEING ARMED WITH A DETAILED BACKGROUND BEFORE EVEN STEPPING ONTO THE SCENE – ALL IN THE PALM OF THE HAND.

Today's radio is a sophisticated tool, but it's mostly limited to voice. The radio of the future will move beyond voice and incorporate data and intelligence. It will enable first responders to get critical information before they arrive on the scene and provide updates while on the scene. It will ensure that public safety officers stay informed and connected to the latest intelligence at all times.

ROOM TO GROW

THE INTERNET OF THINGS (IOT) IS EXPANDING CAPABILITIES AND ENABLING DEVICES TO CONNECT AND COMMUNICATE WITH NEW PLATFORMS AND SENSORS.

It's critical that all devices are able to communicate with each other and integrate into one seamless system. Today's diversity of products and technology needs to work together. And the system needs to be able to grow as organizations expand.

The radio of the future will be built upon a platform of extensibility and connectivity. It will enable agencies to add sensors and other technologies that will seamlessly integrate with the central radio network. And that network will be able to evolve with the organization through added capabilities and functionalities. Ensuring the radio system will grow and change as the needs of public safety organizations evolve.

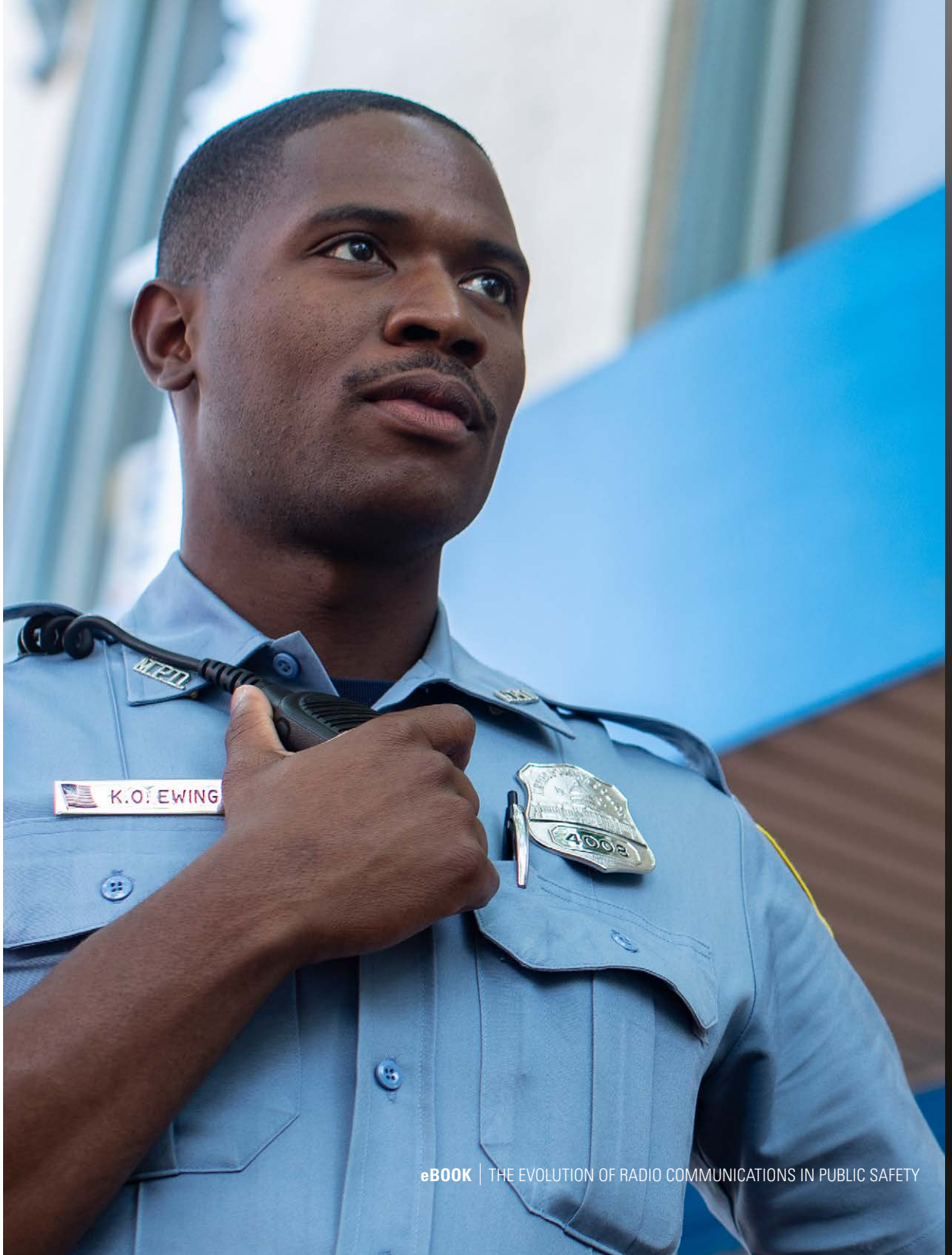
TOGETHER IN ONE DEVICE

FOR FIRST RESPONDERS, THEIR RADIO IS THEIR "FIRST-INSTINCT TOOL."

It enables them to communicate critical information and stay connected at all times. But there is room to evolve. To adopt the best features of consumer products and incorporate them into a device that is appropriate and effective for public safety.

The radio of the future will be carefully designed with public safety in mind. Combining the known usability of the radios responders have come to rely on with new features and interactivity that the next generation will need. The technology will be carefully managed and curated for the public safety industry and designed to provide exactly what is needed for the job at hand.

Radio has come a long way from its first introduction into the public safety field. And it continues to evolve and advance to meet the ever-changing needs of first responders around the globe. As complexity rises for those on the front lines, technology has the opportunity to add incredible value – simplifying processes and introducing efficiencies. It opens up the possibility of taking the first instinct tool that first responders rely on – their radio – and enhancing it with intelligence, connectivity and extensibility. Ultimately, this radio of the future will provide officers with the technology they need to stay focused and safe when it matters most.



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