



BACKGROUND

# emergency notification

a life safety white paper

EST BRAND LIFE SAFETY & COMMUNICATIONS FROM EDWARDS

See what's possible now...

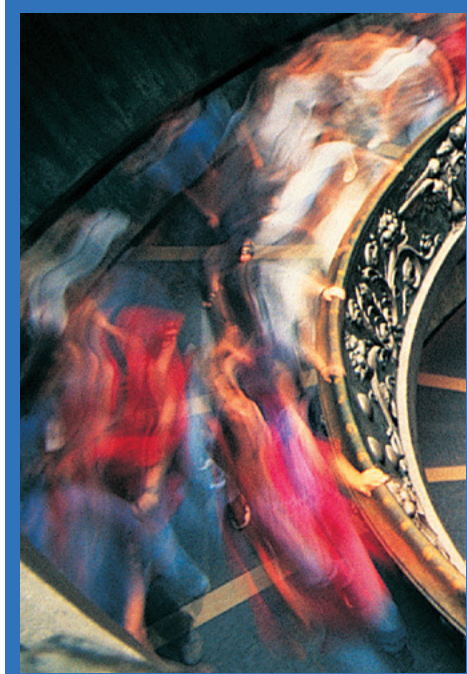
# 2

For as long as there have been buildings there has been the need to prevent people from becoming trapped in them. Structures, by their very nature, inhibit movement. When an exit becomes blocked, and deadly smoke fills occupied spaces, people need to be directed to safety. Quickly. This is more important today than at any other time in history.

As structures become more complex, so too does the means of escape. When fire destroyed London in 1666, people were able to get out of their homes and shops with little difficulty. Warning cries were heard in the streets. People made their way to safety because they could see the approaching flames and because they were able to communicate directly with those who knew the path of the fire. Yet despite the fact that some 13,000 buildings were consumed by fire, few people lost their lives.

Two centuries later when Chicago burned, it was a different story. While a nearly identical number of buildings were destroyed, the death toll was immense compared with the Great Fire of London. Obviously population density played a part, as did the size and relatively complex nature of the buildings. But perhaps the most crucial element lacking in the Chicago blaze was communication: early warning of the impending disaster; clear direction as to a means of escape.

Present-day architecture is as far removed from 19th Century Chicago as the buildings that burned in that city's fire from 17th Century London. What makes matters even more precarious today is that, with the proliferation of synthetic building materials and furnishings, the products of combustion are much more deadly. Speed is more important than ever; event notification is absolutely vital.



Even if the panel goes off-line, the emergency audio system will continue to operate, sending coded signals in the event of an alarm input.

## Communications come full circle

It's interesting to note that with all the advances in life safety over the centuries, the method of notification has come full circle. In 17th Century London, voice communication saved lives. A year after the Chicago fire, Robert Edwards installed the first electric alarm bell in a New York City church, and for decades to follow, bells offered the primary means of disaster warning.

Today, voice communication is again saving lives by providing early warning and direction. Spoken instructions, whether pre-recorded or broadcast live, can provide infinitely more information than a ringing bell or a sounding horn. But the similarity with pre-industrial methods ends there. Now computers are doing the talking and sophisticated programming determines who hears what, and when.

Just as bells represented a quantum leap in fire alarm technology of the day, digital voice communication is setting the pace for the latest generation of life safety systems. The EST3 Fire and Security Control Platform, engineered by Edwards, offers perhaps the most sophisticated emergency communications package available today. Providing digital quality sound, and eight channels of audio over a single pair of twisted wires, EST3 is the product of advances in both digital sound processing and microprocessor-based control.

The system represents a departure from conventional approaches to emergency voice communication because it integrates audio into the entire life safety package. It is not a bolt-on, or an add-in.

## No-compromise solution

Early life safety voice communication systems typically piggy-backed on external audio systems that were de-

signed to meet the needs of office paging or even music sound systems. As a result, these conventional non-integrated life safety systems were often forced to utilize hardware not always intended for this application. This shotgun wedding didn't always result in a happy marriage.

With the development of EST3 came the opportunity to provide a package that would finally satisfy a building's emergency audio needs without compromising the all-important issue of life safety.

From a life safety point of view, there is no match for an integrated emergency audio system. It performs flawlessly under a much wider range of conditions and configurations. While non-integrated systems must be configured to accommodate audio communications, EST3 is audio-ready "out of the box." This means that there is no compromise on performance. The system is engineered for audio, so there are no complicated protocols to set up, no factors that could limit the application of voice communications.

This has definite advantages when it comes to ensuring the system has enough power available to drive all connected audio amplifiers. Non-integrated systems that use standard amplifiers typically suffer from noise, cross-talk, and distortion under low power conditions. EST3 emergency audio amplifiers, on the other hand, are specifically engineered for use in life safety systems and are finely tuned for a much wider range of operating conditions. In fact, testing by Underwriters Laboratories has concluded that EST3's audio system suffers relatively little distortion under the worst-case scenario of batteries operating at near cutoff levels with no external power.

Integrated audio also boosts system survivability by extending the computing power of EST3's main processor right

Throughout history, the evolution of emergency evacuation has kept pace with architectural developments. Voice annunciation is the latest answer to taller buildings and sprawling complexes, but it has remained on the periphery of system design — until now.

into the audio system. This means that the voice communication system is fully supervised at the main control panel and all connected network nodes. In the event of a trouble stemming from the audio system, the precise nature of the problem — not some obscure trouble code — is displayed on the panel's LCD display. Even if the panel goes off-line, the emergency audio system will continue to operate, sending temporal 3-3-3 signals in the event of an alarm input. This extremely high level of survivability is a definite advantage for a system whose purpose is to warn of danger.

System operation also benefits from integrated audio because switching can be programmed through software. Many non-integrated systems (also known as "interfaced systems"), rely on separate banks of relays for evacuation and alert inputs. These are connected to external speaker wiring and require the operator to manually select each zone when paging to different areas of a building. Integrated audio eliminates the manipulation of

complicated rows of buttons by allowing the operator to automatically select any pre-programmed area or group of areas. For example, with the press of a single button, EST3 can page all areas in alarm, or areas adjacent to the alarm zone, or all stairwells, etc.

### Digital audio sends clear message

This is a key life safety feature that reduces the chance of errors that could cost lives. If, in an emergency situation, the operator broadcasts instructions to the wrong area of a building, occupants could easily be directed into the path of danger instead of away from it. That's what happened at Dusseldorf Airport in 1996 when sixteen people died because during an evacuation they were mistakenly directed into an area filled with toxic smoke.

The quality of sound delivered by EST3 is among the best offered by any emergency audio system. In fact, it offers true digital-quality sound. But digital audio in the life safety context is much more than just superior audio fidelity. It lies at the very heart of the tremendous advantages EST3 has over any other system of its kind.

Because EST3 transmits audio in digital format, all eight channels of audio provided by the system can be carried over a single pair of twisted wires. No costly shielded cabling is required. And that saves money.

Digital audio also allows the system to broadcast clearer sound over larger areas. Because the digital signals are converted back to analog signals at the amplifiers, and because the amplifiers can be located virtually anywhere in a building, much longer wire runs are possible – without sacrificing intelligibility.

## **Eight channels provide ample audio bandwidth**

Multiply all these benefits by eight and the strength of the EST3 emergency audio system starts to come into perspective. Eight multiplexed channels of audio over the same pair of wires means there's ample bandwidth for all emergency communications needs. It means that during a crisis, seven different messages, plus live paging can be programmed to broadcast to eight different zones or locations simultaneously. It means that different recorded messages can play to evacuation and alert zones – even in different languages – while firefighters talk over handsets and response personnel broadcast instructions to people in stairwells or elevators. It means that all this can be accomplished without interruption or priority queuing that plague analog voice communications systems limited to two or three channels at most.

Orchestrating all this audio activity requires a control system built to manage it, which brings us back to the advantage of integrated audio in emergency evacuation applications. Audio capability places heavy demands on any life safety system. Both hardware and software related. A system engineered to meet these demands will be more efficient, more effective, and less prone to failure than a patchwork of subsystems and add-on modules designed to merely accommodate audio.

Cries of warning from the street and the sound of ringing bells have in their turn been rendered inadequate protection by developments in architecture. After the Great Fire of 1666, architect Christopher Wren rebuilt London to resist fire. Similarly, fire codes were adopted across the United States in the wake of the Chicago blaze.

But we live in different times now, and the life safety challenges posed by modern high-rise buildings and sprawling commercial/industrial complexes have never been faced before. Clear instructions delivered quickly and efficiently will meet these challenges. We don't live and work in buildings with highly combustible straw roofs any more, but then again, we can't just open a door to be free of them either.



### **Detection & alarm since 1872**

U.S.  
T 888-378-2329  
F 866-503-3996

Canada  
Chubb-Edwards  
T 519 376 2430  
F 519 376 7258

Southeast Asia  
T : +65 6391 9300  
F : +65 6391 9306

India  
T : +91 80 4344 2000  
F : +91 80 4344 2050

Australia  
T +61 3 9239 1200  
F +61 3 9239 1299

Europe  
T +32 2 725 11 20  
F +32 2 721 86 13

Latin America  
T 305 593 4301  
F 305 593 4300

[utcfireandsecurity.com](http://utcfireandsecurity.com)

© 2010 UTC Fire & Security.  
All rights reserved.