

LifeSafety

MAGAZINE

Information on life safety from the leader in fire detection

The UL864 9th Edition Dramatically Affects the Fire- and Life-Safety Industry



Code Establishes Common Platform

A/E Pros Discuss Life-Safety Design, Space Selection and Code Compliance

Charles Darsch Receives Prestigious Industry Award

Directional Sound 'Exit-Marking Audible Notification Appliances' Included in 2007 Edition of NFPA 72



Carbon Monoxide: Get the Facts from Someone You Trust.



Carbon monoxide (CO) is an odorless, colorless, tasteless and highly toxic gas. It is produced when flame-fueled devices malfunction or don't receive sufficient ventilation.

Many common residential and commercial appliances can release carbon monoxide, such as clothes dryers, power tools, hot water heaters, furnaces, space heaters and generators.

Many ordinary household appliances produce CO.

If inhaled, CO immediately absorbs into your bloodstream, replacing your oxygen. Depending on the concentra-

tion of CO in the air and your length of exposure, effects can range from a simple headache to suffocation.

The best way to protect building occupants against CO poisoning is to install system connected detectors.

Only monitored carbon monoxide detectors are guaranteed to protect all the time.

As organizations such as the National Safety Council and the Centers for Disease Control and Prevention continue to educate the world on the dangers of

CO, the market continues to grow.

Right now, CO detectors are the fastest growing segment of the life safety industry.

In fact, as of August 2006, 12 states and dozens of municipalities require CO detectors in residential and commercial dwellings. Nine more states have legislation pending.

To learn more about CO and the recommended criteria for choosing a CO detector, take our online training at www.systemsensor.com/CO.

The System Sensor CO1224 carbon monoxide detector safeguards life with its electrochemical sensing technology, the industry's most reliable technology that accurately measures and provides early warning of carbon monoxide levels in the air. CO1224 also offers:

- System connecting capabilities for around-the-clock protection.
- Full compliance with UL 2075, offering both a trouble relay and wiring supervision.
- The lowest current draw in the industry.
- Versatile mounting for wall and ceiling.

 **SYSTEM
SENSOR**[®]
advanced ideas. advanced solutions.[™]
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www.systemsensor.com

An Additional Layer of Protection

System Sensor realized several years ago a growing need to expand its product portfolio to provide its customers with protection against the dangers of carbon monoxide poisoning, the leading cause of accidental poisoning death in America. Carbon monoxide is a colorless, odorless, deadly gas produced by burning any kind of fossil fuel.

System Sensor found that legislative bodies and major municipalities across the United States were passing laws that required the installation of carbon monoxide detectors in new and retrofitted buildings. In fact, during the past decade, 11 states, mostly clustered in the northern region, and large cities like New York, Chicago, Charlotte and St. Louis, passed resolutions to better protect their constituencies from the danger carbon monoxide poses. Several other states have pending legislation.

Just as regulation played a key role in the growth of system-connected smoke detectors, we believe regulation will be a key factor in the growth of system-connected CO detectors. These ordinances will aid in the adoption of CO detectors in the market.

What System Sensor found, however, was a market void. As a result, the company developed the only UL 2075 compliant system-connected carbon monoxide detector available on the market. The CO1224 carbon monoxide detector meets Underwriter Laboratories' standard by incorporating a code-required trouble relay into the device. This allows the CO1224 to communicate with the system, for instance, by sending a sensor end-of-life signal to the control panel. No other carbon monoxide detector has this code-required capability. Additionally, the CO1224 incorporates SEMS-type terminal Philips-head screws to provide a quicker and more positive wiring connection while facilitating code-required wiring supervision.

We will continue to look for new products, because providing products that protect the lives of our customers is more than an ideal. It is our way of life.



Richard Roberts
Product Manager
Security Business Unit

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LifeSafety

MAGAZINE

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Your thoughts and comments are welcome at info@systemsensor.com. For more information on System Sensor products, call 800-736-7672 or visit www.systemsensor.com.

The UL864 9th Edition Dramatically Affects the Fire- and Life-Safety Industry

New standard establishes a common platform that allows increased cost-effective retrofit flexibility.

The Underwriters Laboratories' new edition of the fire alarm controls standard may prove to be one of the most significant changes the fire- and life-safety industry has seen in the past 20 years.

"The 9th edition of UL864 is bordering more on revolutionary than evolutionary because of the time lapse since the publication of the UL 8th edition. During this interim, three cycles of the National Fire Alarm Code NFPA 72 were completed — in 1999, 2002 and 2007*," says Isaac Papier, vice president, industry relations, Honeywell Life Safety. "It has brought about a tremendous amount of re-design in the



* NFPA added a year to its normal 3-year cycle and because the standard will not be published until late 2006, it will be designated the 2007 edition.



industry. The changes have strengthened requirements for compatibility between smoke detectors, annunciation devices and the control panels, as well as status display and signal processing time.”

The UL864 9th edition includes a major change in alarm signal processing time that is driven by newer editions of the National Fire Alarm Code. The 90-second signal processing time for annunciation of an alarm from the time an initiating device is tripped has been reduced to 10 seconds. This change is a reflection of the capability of new technology that is incorporated in the new generation of alarm equipment.

Standardized Interface

Most importantly, the new edition of UL864 standardizes the interface between fire alarm notification appliance circuits and annunciation devices. Under this standardized scheme called regulated circuits, considerable new latitude is afforded to the installer in choosing compatible notification appliances. This is a significant enhancement from the old process where if the notification appliance was not identified in the control unit installation wiring diagram, it was not compatible.

“Because System Sensor manufactures initiating devices and audible/visible (A/V)

annunciating devices, this change is tremendously important to us because our products are at both ends of the control unit,” explains Papier. “Now, device manufacturers are able to specify operating parameters for their annunciation devices as a mechanism to establish compatibility. Engineered systems designers will then be able to determine which devices are compatible with which control unit by comparing specifications for regulated NAC circuits and notification appliances. System Sensor has a broad range of devices that will be compatible with most systems. Under the 9th edition, the determination of compatibility will require a review of ratings rather than a lengthy and expensive test program by UL.” It should be noted that some manufacturers have designated some or all of their NAC circuits as “Special Application.” The new compatibility scheme would not be applicable to these circuits.

Expandable Systems

During the life of a building, it may be expanded or remodeled to the extent that additional horns and strobes may be needed for continued code compliance. If the original devices are no longer available, it puts the building owner at a tremendous disadvantage, because it often means the entire system needs to

be replaced. Under the new scheme, building owners will benefit from having a choice of multiple brands of A/V products and the ability to determine compatibility, especially in retrofit situations.

“With a standardized interface between fire-alarm control and the annunciation devices, the owner gets relief. This was a primary concern when this section of UL864 was rewritten,” says Papier. “But, in order to have this flexibility, the voltage and current ratings of the NAC circuits have to be very clearly defined so that by comparing ratings, you can establish what is and isn’t compatible with a certain control panel.”

This flexibility, Papier says, is the result of the standard’s complexity that requires lengthy and complicated testing to address in-rush current, steady-state current, and maintaining voltage to operate the strobe and synchronization. “UL developed a testing protocol that permitted a device to be rated for all of those parameters,” says Papier.

This puts the responsibility directly on the device manufacturers to correctly report product ratings. It also puts pressure on designers and installers to make critical product choices, as their reputations are linked to the correctness of the installed system.

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COVER STORY

UL864 9th Edition

(Continued from page 5)

Operating Parameters

Papier recommends careful examination of the operating parameters when selecting devices to incorporate into an existing facility because some manufacturers may rate their products based on steady-state current, as opposed to in-rush current. By doing so, installers and engineers avoid the risk of system failure due to the control unit not being able to provide the required power to supply all the devices on the circuit. To guard against this situation, System Sensor will continue to rate its devices using the most conservative standards.

“When designers select a System Sensor product, they can be very much assured that a worst-case rating has been stated. They can have a great deal of confidence in those numbers based on our consistent approach to honest and conservative ratings,” says Papier.

Another advantage of the new standardization is that the industry can now focus on maximizing electrical efficiency to drive down costs of the life-safety system. System Sensor’s low-current-draw products will not only decrease life-cycle costs, but can have a big impact on initial cost.

“Our low current draw makes for an efficient installation,” says Papier. “When the number of A/V notification appliances grows, requiring higher amounts of energy to the circuit, this means a bigger power supply and bigger wires. If you can have a reliable, efficient device, you can optimize the installation and reduce your

costs right up front. The expense of the installation process depends, to a great degree, on the efficiency of the interconnected devices. Clearly, there is great benefit in low current draw.”

The UL 9th edition puts the industry one step closer to the “perfect” fire-alarm system. “As we converge on this mythical, perfect system, we continually learn. This allows us to upgrade the standards and performance requirements,” says Papier. “All of

engineering is to some degree an approximation. In a perfect system, the earliest stage of fire would provide an instant annunciation of the alert signal, and power consumption would be nil. But then it becomes a matter of practicality: You reach a point that for all practical purposes, the system is perfect. We’re pretty much there. Ten seconds, as required by the new standard, is a very, very short period of time.” LS

SpectrAlert® Advance CHSW

The SpectrAlert Advance CHSW is a white chime/strobe with selectable strobe settings of 15, 15/75, 30, 75, 95, 110, and 115 cd for ceiling or wall installation.

Physical/Electrical Specifications

| | |
|---|---|
| Standard Operating Temperature: | 32°F to 120°F (0°C to 49°C) |
| Humidity Range: | 10 to 93% non-condensing |
| Strobe Flash Rate: | 1 flash per second |
| Nominal Voltage: | Regulated 12DC/FWR or regulated 24DC/FWR |
| Operating Voltage Range: | 8 to 17.5V (12V nominal) or 16 to 33V (24V nominal) |
| Input terminal wire gauge: | 12 to 18 AWG |
| Chime/strobe dimensions (including lens): | 5.6" L x 4.7" W x 2.5" D (142 mm L x 119 mm W x 64 mm D) |





Choose the Right Tool for the Job

Different Applications Require Different Speakers

System Sensor's **SP2 series** voice evacuation speakers produce the most intelligible reproduction of the human voice. SP2 sound is yielded by a wide frequency response and low total harmonic distortion. You can only find sound quality this strong in SP2.

Although SP2 is the most popular choice for voice evacuation, areas with high ambient noise levels may require louder speakers. System Sensor's **new SP3 series** offers up to 6dB greater sound output at all tap settings.

Only at System Sensor can you choose between SP2's quality and SP3's volume in UL1480-listed voice evacuation speakers. To determine the right speaker for your next job or for information on System Sensor's complete line of wall and ceiling speakers and speaker/strobes, call or visit our website today.



advanced ideas. advanced solutions.™

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A/E Pros Discuss Life-Safety Design, Space Selection and Code Compliance

LifeSafety interviews Angie Wells, P.E., principal, and Rodwell King, senior project manager, of GPD Group in Akron, Ohio. GPD Group is a multi-disciplinary A/E firm that provides architectural, interior design, mechanical, electrical, structural, civil engineering and construction administration services to clients nationwide.



QUESTION

ANSWER

How much responsibility does the architect assume for life-safety matters?

King

The architect leads the design, and the engineer follows up with the details.

The engineer is responsible for the technical aspects of making sure there is adequate egress lighting and signage and that they are powered correctly. The location of these elements is up to the architect.

Who is responsible for code compliance?

King

It depends on the components. For example, lighting has to be compliant with the National Electrical Code®. Therefore, the engineer would be in charge. In terms of suppression, you would have a licensed professional designing the sprinkler system. Both of these items are outside the scope of the architect's work, but overall compliance with the building code is the architect's job.

Are clients more concerned with initial cost or operation/maintenance cost?

Wells

That varies. Clients with low operating budgets are typically willing to pay more upfront for lower operational costs, whereas others are less concerned with the long-term operating costs and are more concerned with the initial cost. We try to determine which approach is most desirable for the individual client. The duration of the lease, the life cycle of the equipment specified for the space, and the initial capital spending available are a few factors that need to be analyzed to determine the appropriate specifics for the design.

Will owners who plan to keep the building spend more money initially for greater savings in operation and maintenance?

King

That's true. And then there are some who plan some obsolescence into their development and they add more time for that cost over the life of the space. It really is not that significant to them.

QUESTION

What if you could cut 40 percent current draw from the fire notification device circuit?

Do larger retailers tend to build their own facilities or take over space?

Do the larger retailers usually rent or own their facilities?

What do you recommend when a client is looking to take over existing space?

At what point should building space be evaluated? What are the code implications?

What do you do to prevent false alarms? How do false alarms affect your clients and your business?

ANSWER

King

In terms of the overall building, it really is not a significant amount. But at the end of the day, savings add up. You need to take a holistic approach. Even if it is more expensive, sometimes the expense is minimal in terms of what the building could achieve in the long run with energy savings.

King

It's a mix. It can vary from location. You might have the same retailer in different locations go into a strip mall or stay in their own box. It's really location, location, location.

King

Both. It just depends on the location and the availability of property. If there is not much land available, they'll go into an existing facility or have it built to suit their needs.

Wells

The space should be appropriate for the proposed use in terms of construction classification and square footage. The function and proposed floor plan should be reviewed to ensure that the suppression system and fire alarm system are adequate and to determine whether redesign of the items will be necessary. The building codes have several requirements: providing lit exits, lights on battery packs that provide a path to the nearest exit and minimum travel distance to the nearest exit. The design should provide a clearly evident means of egress. Clear identification of egress paths is vital because patrons may be unfamiliar with the space. Some factors for egress design consideration include size, clarity, lighting and signage.

King

There are a lot of factors that could be involved based on the differing uses. Think of an Internet café, which would have a wide, open space, versus a craft store that could have a lot more shelves, material and flammable elements. You may need to have a suppression system engineered, depending on how the store is laid out. Or, you may need additional smoke detectors to trigger the alarms. You definitely need a design professional to evaluate the space.

King

The time to review and evaluate a facility is when you are doing alterations to an existing facility. In Ohio, you do not have to bring the whole building up to current standards, depending on the scope of the work you're doing. It really is an interpretation by the building official. Design professionals with experience have a feel for what will be permissible and what will not be.

Wells

The detection and notification systems should be maintained. Facility operations should budget funds for adequate testing and maintenance of these systems. Designers should locate these items appropriately and ensure installation is tamper proof. It is important that the designers provide systems that operations can maintain. Businesses are exposed to shrinkage due to false alarms. LS

Charles Darsch Receives Prestigious Industry Award

System Sensor executive honored with Triton Award for his lifetime achievements in the security industry.



Charles G. Darsch, director of corporate relations for System Sensor, was awarded this year's Triton Award for extensive contributions to the security industry.

"It's an honor to work with a professional who is as respected and recognized as Charlie Darsch," says David George, director, corporate communications, System Sensor. "He is the dean, so to speak, of the security industry. His wealth of knowledge has touched all of the organizations he has served during his productive career."

The Triton Award, established by the Central Station Alarm Association (CSAA), National Burglar and Fire Alarm Association (NBFAA) and the Security Industry Association (SIA), honors a professional whose lifetime achievements

have significantly contributed to the advancement of the security industry. This prestigious award is typically presented to professionals from a systems installation company. Yet, System Sensor's Darsch was unanimously selected for his dedication to all aspects of the industry.

Ralph Wayne Sevinor, a 2004 Triton Award recipient and president of Wayne Alarm Systems in Boston, says, "Charlie has been the consistent stabilizing force that has helped the electronics, security and detection industries move forward and prosper. From the beginning, Charlie has always worked to keep the lines of communication open. Charlie is known as the go-to person where the impossible becomes possible. His efforts will benefit us all for years."

50 Years of Experience

Darsch entered the security industry in the 1950s after losing a friend to an intruder. Putting his degree in electrical engineering from the University of Massachusetts Lowell to good use, he founded an alarm installing company, Minuteman Security. By 1972, Minuteman Security and Darsch were gaining recognition, and Aerospace Research, a Boston-based

company that was developing highly sophisticated intrusion detection sensors, took notice.

Darsch sold his alarm company to Aerospace and became its Northeast Sales Manager. "It was a highly intriguing venture into the new world of electronics," Darsch says. "As that company grew, purchased other companies, was acquired (by Aritech Corp. and later, Sentrol) and then spun off as a public company, I grew with it." By 1989, he was promoted to vice president.

In 2001, Darsch joined System Sensor as the director of corporate relations. At System Sensor, as well as Honeywell Analytics, Darsch mentors the sales team, opening doors through his vast array of fire and security contacts.

Industry Statesman

Darsch currently sits as a non-voting vice president and SIA representative to the NBFAA board of directors. He is also an ex-officio for the Alarm Industry Research Educational Foundation (AIREF), which is charged to receive, invest and reinvest money exclusively for charitable, scientific and educational purposes. Formerly, Darsch sat as a board member of CSAA, was the president and convention chairman of SIA and was an

Industry Education

2007 MAJOR TRADE SHOWS

Association of Heating & Refrigeration Expo

Dallas, TX
January 29-31, 2007

ISC West Expo

Las Vegas, NV
March 28-30, 2007

National Fire Sprinkler Association Annual Seminar and Exhibition

Las Vegas, NV
May 2-5, 2007

NFPA World Safety Conference and Expo

Boston, MA
June 3-5, 2007

Americas' Security Expo

Miami, FL
July 24-26, 2007

ISC East Expo

New York, NY
September 11-12, 2007

ASIS International Seminar and Exhibits

Las Vegas, NV
September 24-27, 2007

American Fire Sprinkler Association Convention

Phoenix, AZ
September 26-30, 2007

executive committee member of NBFAA.

Other organizational positions Darsch has held include:

- Board member of the NBFAA's CP-01, which helped develop the first control panel standard for false alarm reduction.
- Industry liaison to the AIREF
- Lifetime member of the Institute of Electrical and Electronics Engineers.
- Member of the American Society for Industrial Security, which was founded to better understand the constant changes in the security industry.
- Member of the National Fire Protection Association, which provides and advocates consensus codes and standards, research, training and education.

Darsch's industry-wide impact also earned him the distinction of being the first supplier to receive the NBFAA Weinstock Man of the Year Award in 1985, as well as being the 1998 SIA recipient of the George R. Lippert Memorial Award for industry leadership. And, along with the Triton Award, Darsch will be awarded the MSCA Award (Mass Systems Contractors Association) in May 2007, a rarity to win both awards in the same year. LS

SYSTEM SENSOR OFFERS ONLINE PRODUCT TRAINING COURSES

Visit www.systemsensor.com/training to stay current on the newest products from System Sensor.

System Sensor offers free online training courses for industry professionals interested in learning about the company's newest products.

These online courses are developed to educate engineers, architects, systems installers, facility directors and other security professionals on the latest technology and most effective strategies to better protect life and property.

To reiterate the most critical information in each course, a multiple-choice quiz follows each presentation, allowing users to gauge their retention.

New course topics include:

- **C01224: Carbon Monoxide Detector**
- **BEAM1224 Series: Reflective-Type Beam Smoke Detectors**
- **Fire Sprinkler Monitoring Products**
- **Mechanical Heat Detectors**
- **SpectrAlert® Advance Notification Devices**

Directional Sound ‘Exit-Marking Audible Notification Appliances’ Included in 2007 Edition of NFPA 72

The 2007 Edition of the National Fire Alarm Code® provides guidance for System Sensor’s ExitPoint™ directional sounders.

The life-safety benefit of directional-sound technology is recognized by the National Fire Protection Association in language that addresses exit-locating systems in the 2007 edition of NFPA 72, National Fire Alarm Code®.

System Sensor’s ExitPoint™ sounders, which fall under the category of exit-marking audible notification appliances, emit non-verbal cues to lead people to an exit in the event of a fire.

The 2007 NFPA 72 substantiates the inclusion of

these directional-sound devices in Chapter 6, Protected Premises Fire Alarm Systems, Section 6.16.8.1 Exit-Marking Audible Notification systems, which states: Where required, exit-marking audible notification appliances shall be activated by the building fire-alarm system.

Other areas of the 2007 NFPA 72, including chapters 7 and 10, address the standards to define exit-marking audible notification appliances, as well as code-complying maintenance practices.

Directional-Sound Devices

Chapter 7 of the 2007 NFPA 72 contains a new section that defines requirements for using exit-marking audible notification appliances. In addition to meeting or exceeding the frequency and sound-level settings specified in the manufacturer’s documented instructions, section 7.4.6.2 sets guidelines to ensure exit-marking audible notification appliance signals are clearly heard and can produce the desired directional-sound effects within 50 feet of

Directional Sound References in NFPA 72 2007 Edition

Chapter 6: Protected Premises Fire-Alarm Systems

6.16.8 Exit-Marking Audible Notification Systems

6.15.8.1: Where required, exit-marking audible notification appliances shall be activated by the building fire-alarm system.

6.16.8.2 Exit-Marking systems shall meet the requirements of Chapter 7.

Chapter 7: Notification Appliances for Fire-Alarm Systems

7.4.6 Exit-Marking Audible Notification Appliance Requirements

7.4.6.1 Exit-Marking Audible Notification Appliances shall meet or exceed the frequency and sound-level settings and guidelines specified in the manufacturer’s documented instructions.

7.4.6.2 In addition to 7.4.6.1, as a minimum, to ensure that exit-marking audible notification appliance signals are clearly heard and produce the desired directional effects for (15.24 meters) 50 feet within an unobstructed egress path, they shall meet the audibility requirements of 7.4.6.1, Narrow Band Tone Signaling for Exceeding Masked Thresholds in at least one 1/3 octave band or one octave band within the effective frequency ranges of the interaural time difference (ITD), interaural level or intensity difference (ILD or IID), and anatomical transfer function or head-related transfer function (ATF or HRTF) localization cues. The signal shall penetrate both the ambient noise and

the fire-alarm signal.

7.4.6.3 Where required, exit-marking audible notification appliances shall be installed, tested, and maintained in accordance with the manufacturer’s instructions.

7.4.6.4 Where required, exit-marking audible notification shall be located at the entrance to all building exits and areas of refuge as defined by the applicable building or fire code.

7.4.6.5 Where exit-marking audible notification appliances are utilized to mark areas of refuge, they shall provide an audible signal distinct from that used for other exits that do not have areas of refuge.

Chapter 10: Inspection, Testing and Maintenance

Table 10.3.1 Visual-Inspection Frequencies

13. Exit-Marking Audible Notification Appliances
Initial/Reacceptance and Semiannually

Table 10.4.2.2 Test Methods

16. Exit-Marking Audible Notification Appliances
Tests shall be performed in accordance with manufacturer’s published instructions.

Table 10.4.4 Testing Frequencies

21. Exit-Marking Notification Appliances
Initial/Reacceptance and Annually

How Directional Sound Works

There are three types of audible information that allow the brain to identify the location of a sound. The first two are known as binaural cues because they make use of the fact that people have two ears separated by the width of their head. A sound that emanates from either side of the mid-line will arrive first at the ear closest to it and will be loudest at that ear. At low frequencies the brain recognizes differences in the arrival time of sound between the ears, or Interaural Time Differences (see Figure A, Part I). At higher frequencies, the salient signal is the loudness/intensity difference between the sounds at each ear, which is called Interaural Intensity Differences (see Figure A, Part II). For single frequencies, these cues are spatially ambiguous.

The final piece of sound localization information processed by

the brain is the head-related transfer function (HRTF). The HRTF refers to the effect the external ear has on sound. As a result of passing over the bumps or convolutions of the pinna, the sound is modified so that some frequencies are attenuated and others are amplified (see Figure B).

The role of the HRTF is particularly important when determining whether a sound is in front or behind the listener. In this instance, the timing and intensity differences are negligible, and there is consequently very little information available to the central nervous system on which to base this decision. To locate the direction of a sound source, the larger the frequency content to overcome the ambiguities inherent to single tones, the better the accuracy.

Figure A: Interaural time and intensity differences of sound

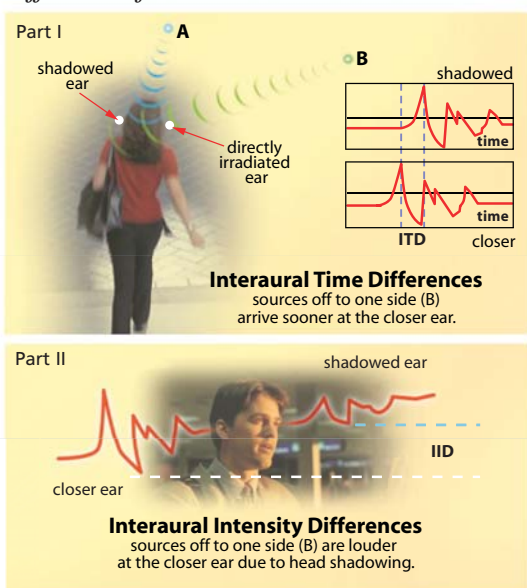
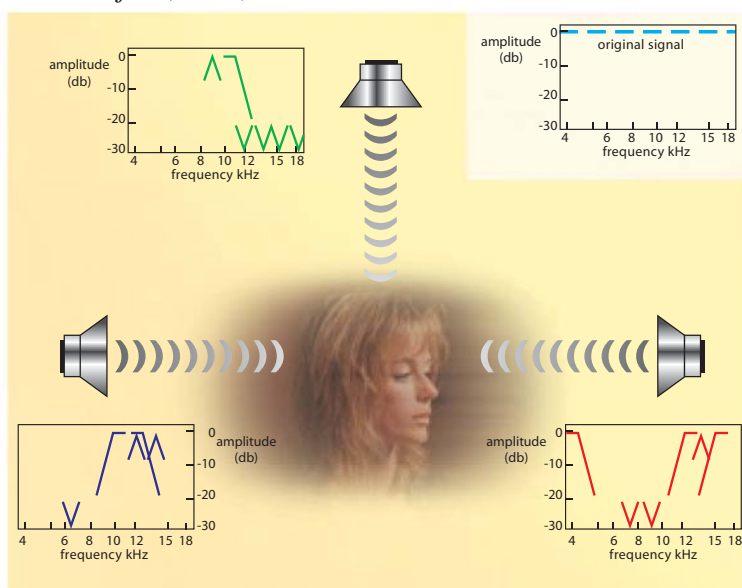


Figure B: Examples of frequency-dependent attenuation for sources in front, above, and behind the listener.



an unobstructed egress path.

Directional sounders also must meet the audibility requirements of Section 7.4.6.2. “To ensure that exit-marking audible notification appliances are clearly heard and produce the desired directional effects for 15.24 meters (50 feet) within an unobstructed egress path, they shall meet the audibility requirements for Section 7.4.6.1, Narrow Band Tone Signaling for Exceeding Masked Thresholds, in at least one 1/3 octave band or one octave band within the effective frequency ranges of the Interaural Time Difference (ITD), Interaural Level or Intensity Difference (ILD or IID) and Anatomical

Transfer Function or Head Related Transfer Function (ATF or HRTF) localization cues. The signal shall penetrate both the ambient noise and the fire alarm signal.” (see “How Directional Sound Works”)

NFPA 72 also specifies locations for installation of directional-sound devices, including the entrance to all building exits, as well as areas of refuge, which must have an audible signal distinct from that used at other exits. Additionally, directional-sound devices shall be located at all identified exits in a building to ensure that occupants utilize all of the exits and areas of refuge, which is the ultimate goal of the technology.

Benefits of Directional-Sound Devices

Annex material in the 2007 NFPA 72 supports the inclusion with a detailed explanation of what constitutes directional sound and how the human ear receives audible information.

In Section 3.3.113.1.1, exit-marking audible notification appliances are defined as “an audible notification appliance that marks building exits and areas of refuge by the sense of hearing for the purpose of evacuation or relocation.” Sounders can be located and identified in an emergency situation due to the broadband

(Continued on page 14)

PRODUCTS

Exit-Marking Audible Notification

(Continued from page 13)

frequency content of their sound. Broadband frequencies are those that contain a large spectrum of frequencies in the human hearing range, 20Hz to 20,000Hz.

In contrast, output by traditional fire-alarm sounders have a strong tonal content, usually centered near the 3,000Hz region (see Figure C). While traditional fire alarm sounders dominate the 3,000Hz and upper harmonic range, a broadband signal is 20 to 30dB louder across the remaining range.

As Figure C shows, both traditional fire alarm and directional sounders are audible except at the narrow range of frequencies where the two lines intersect, masking each other. At other frequencies, the directional sounders will be audible because they have a wide spectral range of broadband sound. Hence, the two types of sound are distinguishable.

Adding Directional Voice Devices

The broadband noise that ExitPoint technology produces dramatically reduces evacuation times.

In addition to broadband directional sounders, in 2007, System Sensor will offer directional sounders with voice messaging. An example of how directional sounders with voice messaging will increase functionality can be demonstrated at a stairwell. Currently, an up- or down-sweep is activated when evacuees are nearing a staircase. With voice capability, ExitPoint will produce the broadband sound and clearly enunciate the words "Stairs Up" and "Stairs Down," as well as "Exit Here" and "Area of Refuge" at the appropriate locations. LS

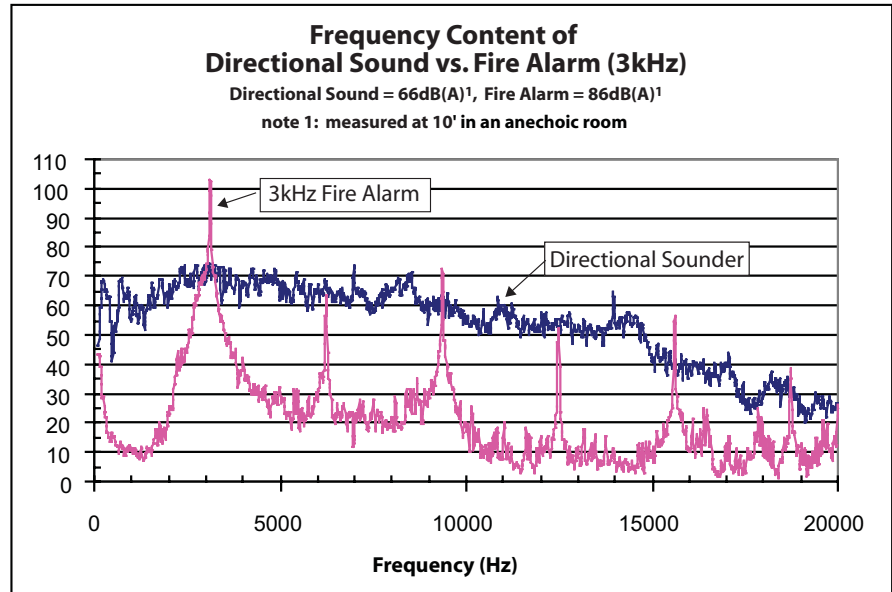


Figure C: Comparison of frequency content of a traditional fire-alarm sounder to a directional sounder

The Future of Directional Sound

Directional-sound technology can enable life-safety professionals to create an audible map using ExitPoint devices to guide occupants along an escape route to safety.

This type of installation requires sounders at exits, stairwells and areas of refuge, as noted in NFPA 72, as well as additional sounders that lead a person through an egress route.

The egress route is dotted with strategically placed directional sounders that produce noise patterns that become progressively faster as a person nears an exit. For this more complex egress system to be effective, sounder placement must align with a direct egress path that does not lead evacuees in a circular route or into a dead end. When creating this type of path that turns or changes direction, the sounder should be located within 2 feet past the turn for maximum effect. Generally, sounder spacing of 50 to 80 feet provides the necessary sound output to alert occupants they should move from one sounder to the next along the egress route. Such spacing will result in occupants entering the audible zone of one sounder a couple of steps after passing the previous audible zone.

The effectiveness of directional sound overcomes two phenomena common in building evacuations. First, occupants tend to exit a building via the same door they entered, often bypassing other exits. Second, people seldom consider the information conveyed by visual exit signs. As a result, directional-sound technology offers significant advantages over visual aids, which can be difficult to see in smoke-filled environments.

Additionally, directional sounders can lead people of all languages to exits using broadband sound, and the audible cues can direct people with visual impairments.

ExitPoint directional sound is the only technology to overcome all of these obstacles.





Artworks courtesy of B.D. Mallon Gallery, Geneva, IL.

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