Welcome to

GAI-TRONICS®

2006

Page Party®

GAI-Tronics®

HUBBELL

Page Party®

2006

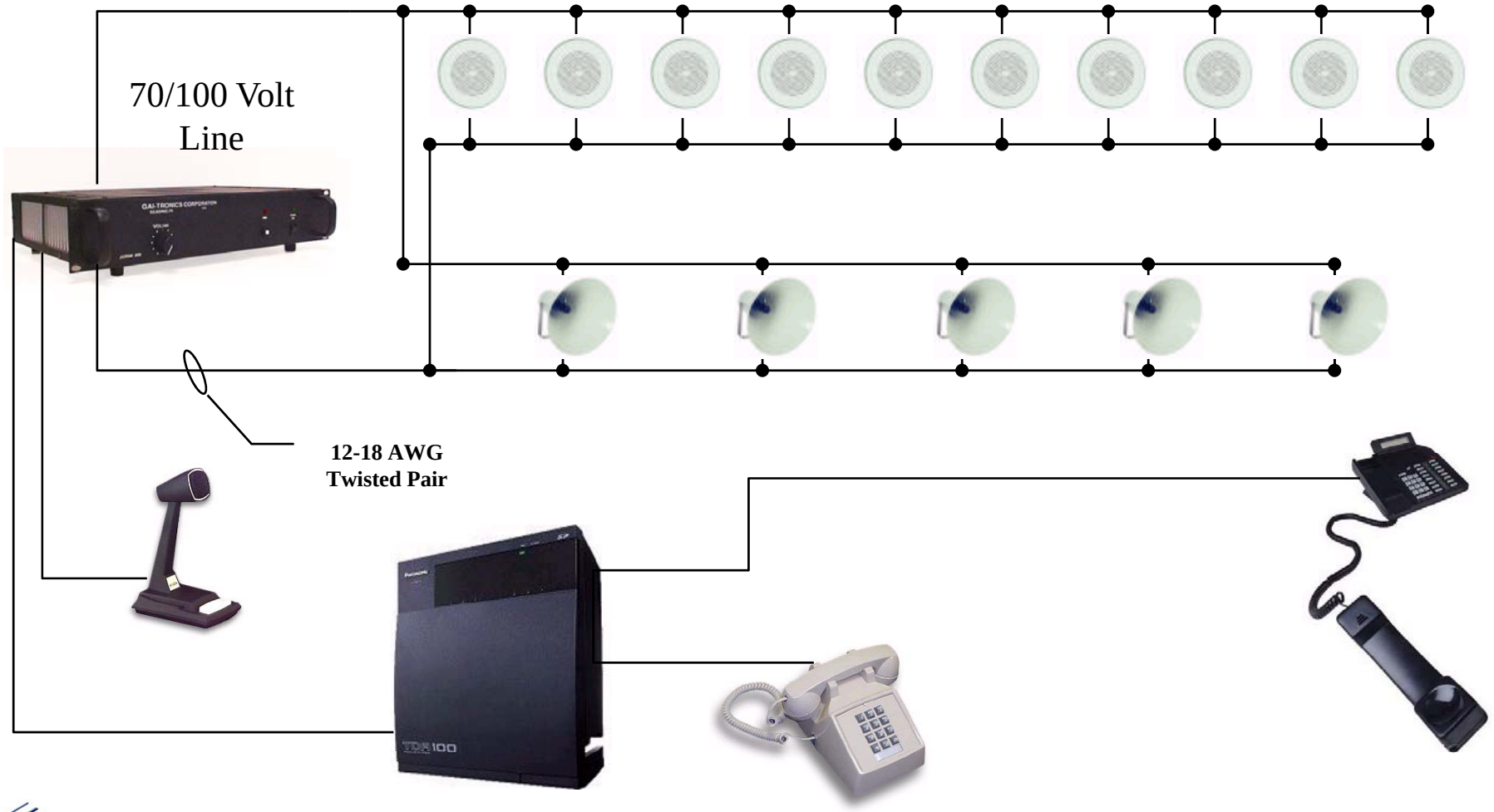
What is Page/Party®?

- Page Party is an intercom and public address system based upon a distributed amplifier architecture
- Allows simultaneous paging to all amplifiers
- Multi-channel non-private party line communications

Page Party®

2006

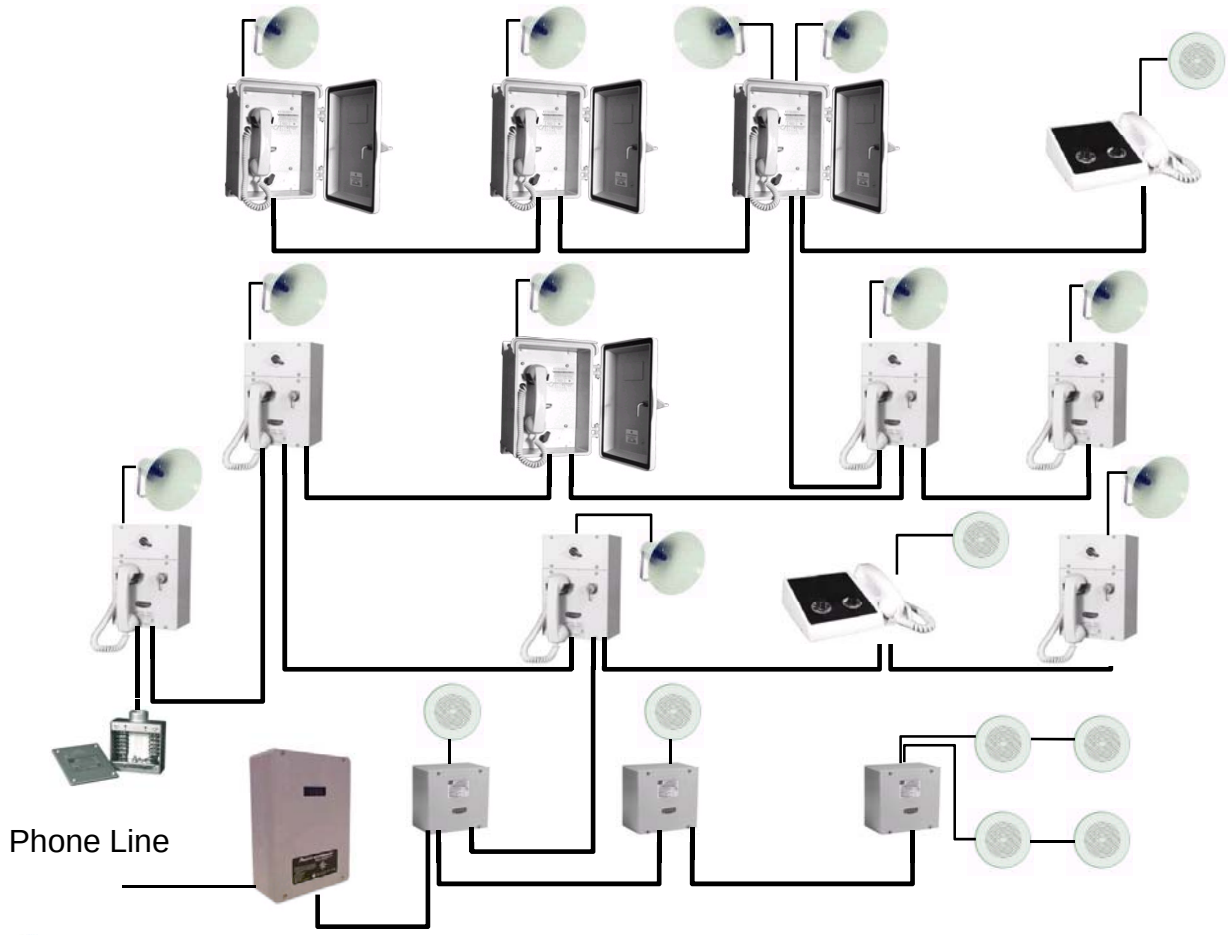
Traditional One-way Paging



Page Party®

2006

Distributed Paging/Intercom



- Distributed handset and speaker amplifier system.
- 1-4 Speakers per station.
- Telephone style communications on 1-5 party lines.
- Page Everyone - Answer from Anywhere.
- System cable distributes audio and power to each station.

Page Party®

2006

Characteristics

- Modular Plug-in Amplifiers
- Distributed Amplifier Architecture
- Low Impedance Audio (33 Ohm)
- Hazardous Area Approvals
- Large System Size/Expansion Capability
- Interface Capabilities
- Rugged Construction Features

Page Party®

2006

Features and Benefits

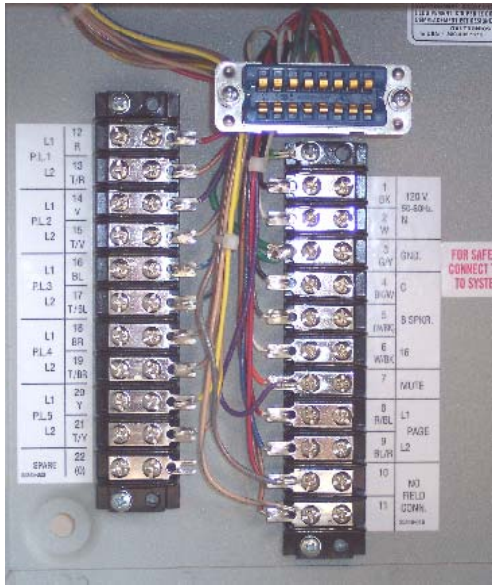
- Distributed Amplifiers
  - A failure in one amp only affects
- Page Party Concept
  - Efficient; call to and answer from anywhere
- 1.6Km Distance from Line Balance
  - Useful in Large Facilities
- Ease of System Operation
  - Little Training Required

Page Party®

2006

Features and Benefits

- Unlimited Stations in a System
  - Supports system expansion
- Space in Enclosure; Double Row Terminal Blocks
  - Eliminates need of junction boxes
- Parallel Station Wiring
  - No home run of cabling
- Approvals
  - Meets the needs of its environment



Page Party®

2006

Features and Benefits

- Hard Wired-twisted Pairs, 33 Ohm Impedance
  - Noise immunity, no cross talk or interference
- Interface Capabilities
  - Intercommunications across platforms
- Conference Calls for up to 5 People
  - Information quickly and easily communicated
- Noise-canceling Microphone-Anti sidetone
  - Clear communications in high noise areas

Page Party®

2006

Features and Benefits

- Rugged/Anti-corrosive Construction
  - Withstands abusive areas, lower maintenance costs
- Single/Multi-party Stations
  - Alternatives for large and small systems
- Pressbar Handsets
  - Permits one-handed operation
- Optional Volume Level Control
  - Volume preset override for night muting or critical alarm emphasis

Page Party®

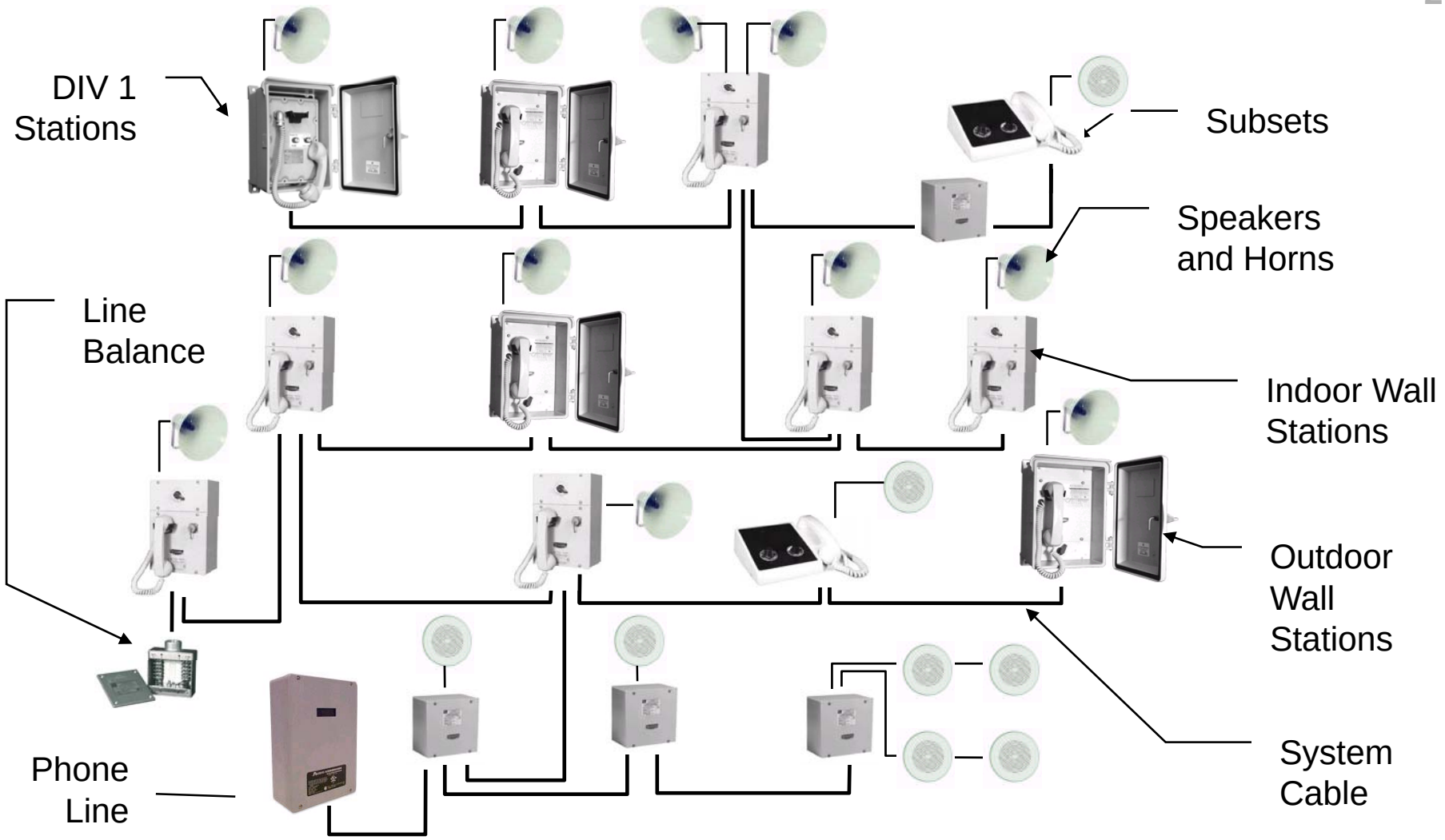
2006

Features and Benefits

- Muting of Local Station Speaker
  - Eliminates feedback
- Optional Wall Station Auxiliary Jack Receptacle
  - Permits hands-free two-way communication operation
- Terminal Block Labels Includes Color Code
  - Simplifies and quickens installation

What Makes Up Page Party®

2006

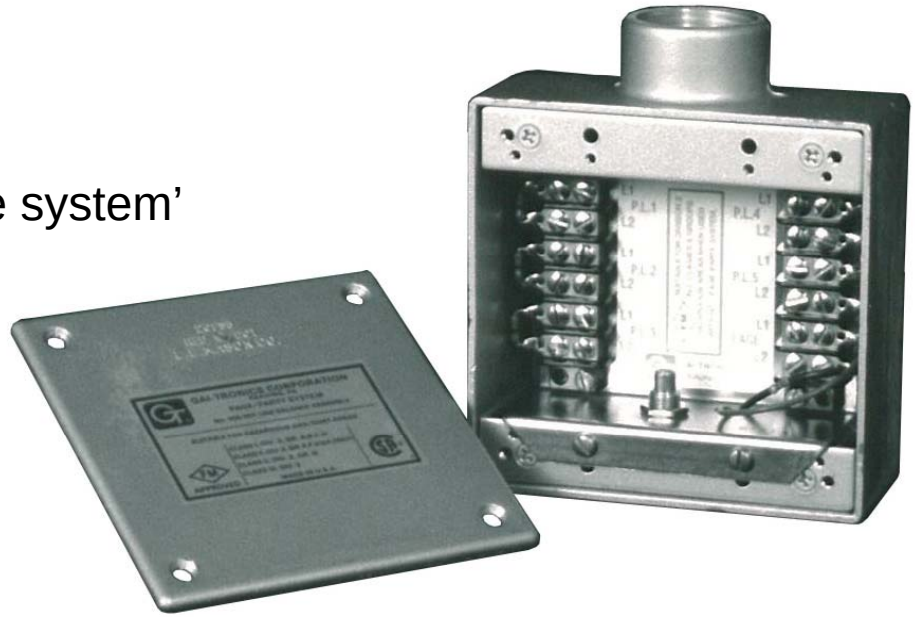


Page Party®

2006

Line Balance

- Provides Balancing of page and party lines in Page Party System
- One required per system
- Installed in the electrical ‘center of the system’
- Fixed 33 ohm resistors for party
- Adjustable balance for page line
- Should be installed next to station.



Page Party®

2006

Handset/Speaker Amplifiers

- **120 VAC Handset/Speaker Amp**
  - Standard 701-302
  - Standard with Auxiliary Jack 701-304
- **120 VAC Speaker Amplifier**
  - 751-001
- **24 VDC Handset/Speaker Amp**
  - Standard 701-307
- **24 VDC Speaker Amp**
  - Standard 751-002

Page Party®

Enclosures

Indoor Enclosures (CRS)

- **120 VAC**
  - Single Party 702A
  - Multi Party 703A
  - Remote Subset 7245-004
- **24 VDC**
  - Single Party 702-002
  - Multi Party 703-002
  - Remote Subset 7245-003

Page Party®

2006

Enclosures

Outdoor Enclosures

- **120 VAC Aluminum**
  - Single Party 732-101
  - Multi Party 7325-101
- **120 VAC Non-metallic**
  - Single Party 733-001
  - Multi Party 7335-001
- **24 VDC Non-metallic**
  - Single Party 733-002
  - Multi Party 7335-002

Page Party®

2006

Remote Subsets

Desktop
- 726-101
- 7265-101

- **Desk Edge**
  - 711-102
  - 7115-102
- **Flush-mount**
  - 716-102
  - 7165-102
- **120VAC Amplifier and Enclosure**
  - 723-001
  - 7245-004
- **24 VDC Amplifier and Enclosure**
  - 723-003
  - 7245-003

Page Party®

2006

Hazardous Stations

Indoor 120VAC

- Single Party 120VAC
  - 780-001
- Multi-Party 120VAC
  - 7805-001
- Speaker Amplifier 120VDC
  - 670-001

Outdoor 120VAC

- Single Party 120VAC
  - 785-001
- Multi-Party 120VAC
  - 7855-001

Indoor 24VDC

- Single Party 24VDC
  - 780-002
- Multi-Party 24VDC
  - 7805-002
- Speaker Amplifier 24VDC
  - 670-002

Outdoor 24VDC

- Single Party 24VDC
  - 785-002
- Multi-Party 24VDC
  - 7855-002

Model Numbers 101

2006

600 Series Units	8 Pin Connector
Handsets	601x or 601-xxx
Amplifiers	651x or 651-xxx
700 Series	16 Pin Connectors
Handsets	701-xxx
Amplifiers	751-xxx
700 Series	24 Pin Connectors
Remote Amplifiers	713-xxx
	723-xxx
700 Series	Remote Subsets
Desktop	726-xxx, 7265-xxx
Desk Edge	715-xxx, 7155-xxx
Flush-mount	716-xxx, 7165-xxx

Page/Party®

2006

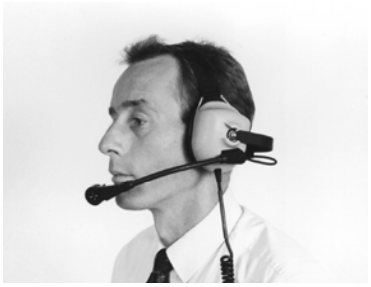
Accessories

Junction Boxes

- Indoor or Outdoor
- Metallic or Non-metallic
- 22-point or 38-point Terminal
- Hinged Door on Non-Metallic
- Model 9974 DIV 2 Approved

Portable Station

- Temporary Communications
- Easily Transported
- 25 Ft. Cable
- Weatherproof Speaker
- Connects to fixed receptacle



Headset

- Allows Handsfree Communications
- Offers 24dB Noise Reduction Rating
- Noise Canceling Microphone
- Hearing Aid Compatible
- Adaptable with or without Hard Hats
- Dual Ear Cups

Page Party®

2006

Acoustic Booths

988-60- 0002- Series
BS476, Part 7 Fire Retardant Classification of 1
Internal Stainless Steel Mounting Plate Std
23.1 dB Noise Reduction
External Mounting Straps
Standard Booth Accepts GTC Equipment
Yellow and Grey

6866- Series
- Fiberglass Construction
- Designed for GTC Equipment
- 9-14 dB Noise Reduction
- Available with Carpet Liner
- Yellow and Grey

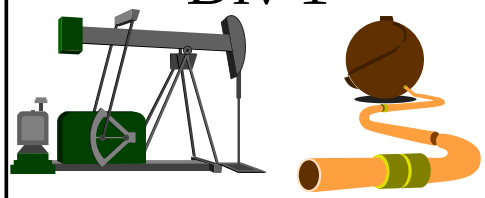
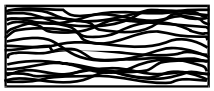
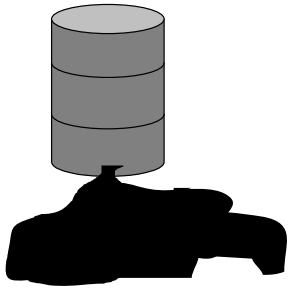
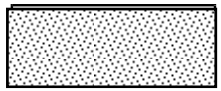
What are Hazardous Areas?

2006

- The National Electric Code (NEC) classifies locations depending on the “properties of the flammable vapors, liquids or gasses, or combustible dusts or fibers which may be present and the likelihood that a flammable or combustible concentration or quantity is present”.

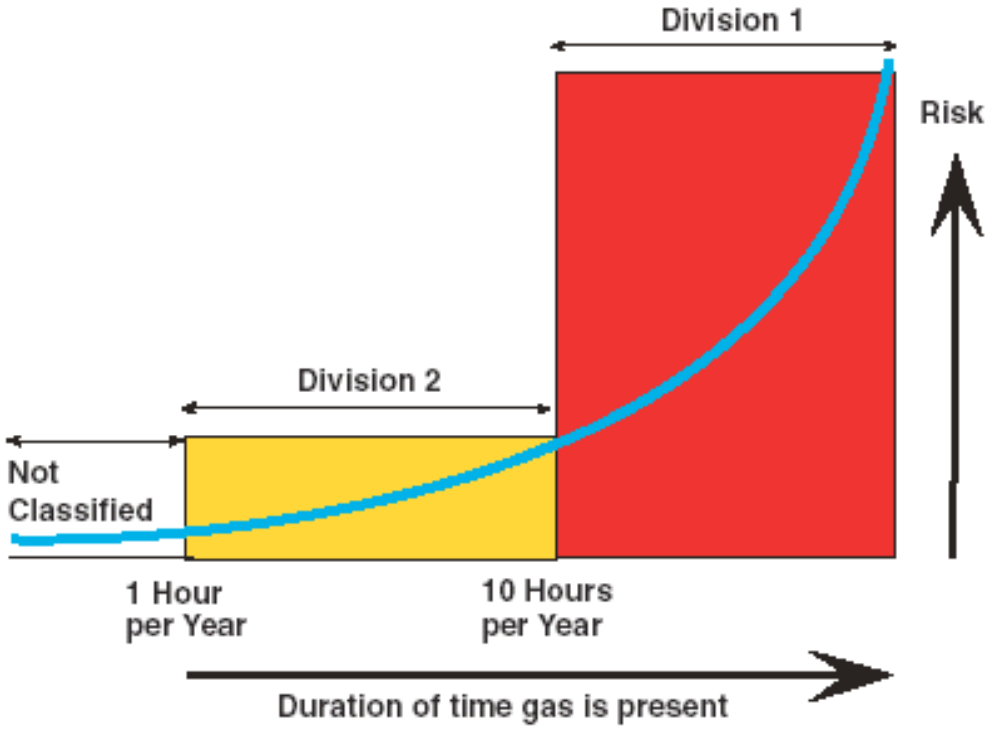
Hazardous Areas

2006

DIVISIONS	CLASSES	GROUPS
Div 1  Normal	 Class I Gas	  A B C D
Div 2  Abnormal	 Class II Dust	  E F G
	 Class III Fibers	none

Hazardous Areas

2006



Hazardous Areas

2006

- **Classes and Groups**
  - **Class I** covers flammable gasses and vapors
    - Class I is subdivided into Groups A, B, C, and D
  - **Class II** covers flammable dusts
    - Class II is subdivided into Groups E, F, and G
  - **Class III** covers suspended fibers and flyings

Hazardous Areas

2006

- **Divisions**
  - **Division 1** describes locations in which hazardous concentrations of gases or vapors may exist under normal operating conditions.
  - **Division 2** describes locations in which flammable liquids or gasses are normally confined but could escape in the event of accidental rupture or breakage of the containment.

Hazardous Areas

2006

Explosionproof vs. Intrinsically Safe

- **Explosionproof**
  - A unit designed in such a way that any internal spark or explosion will not permeate the enclosure of that unit and reach the surrounding atmosphere.
- **Intrinsically-Safe**
  - A unit designed with an electronic isolation barrier to eliminate the possibility of any spark or explosion. No sparks can possibly occur.

Hazardous Areas

2006

- **Class I** - Gases or Vapors
- *Division 1*
  Hazardous vapors present
- *Division 2*
  Hazardous vapors contained, but may be present
- Groups for both
  Division 1 and Division 2

  Group A - Atmospheres containing acetylene
  Group B - Atmospheres containing hydrogen or gases or vapors of equivalent hazard such as manufactured gas
  Group C - Atmospheres containing ethyl-ether vapors, ethylene or cyclo-propane
  Group D - Atmospheres containing gasoline, hexane, naptha, benzene, butane, propane, alcohol, acetone, benzol, lacquer solvent vapors, or natural gas

- **Class II** - Dust
- *Division 1*
  Air suspended
- *Division 2*
  Surface accumulated, non-air suspended
- Groups for both
  Division 1 and Division 2

  Group E - Atmospheres containing metal dust including aluminum, magnesium, their commercial alloys, and other metals of similarly hazardous characteristics
  Group F - Atmospheres containing carbon black, coal, or coke dust
  Group G - Atmospheres containing flour, starch, or grain dust

- **Class III** - Fibers
- *Division 1*
  Fibers handled, manufactured, or stored
- *Division 2*
  Fibers handled or stored
- No Groups for Class III
- Atmospheres containing textile,

  wood or synthetic fibers

370 Two-Way Interface

Features:

- Can be used for one-way or two-way interfacing
- 33 ohm to 600 ohm
- Adjustable levels and balance
- Copper wire connections

Models:

- 370-201 (has choke for keeping a phone line off-hook)
- 370-202 (has blocking capacitors so it doesn’t draw line current)

370 Two-Way Interface Uses

370-201:

- Page/Party® to Telephone Line

370-202:

- Page/Party® to Electrosound
- Page/Party® to Central Amp
- Page/Party® to Telephone Cable

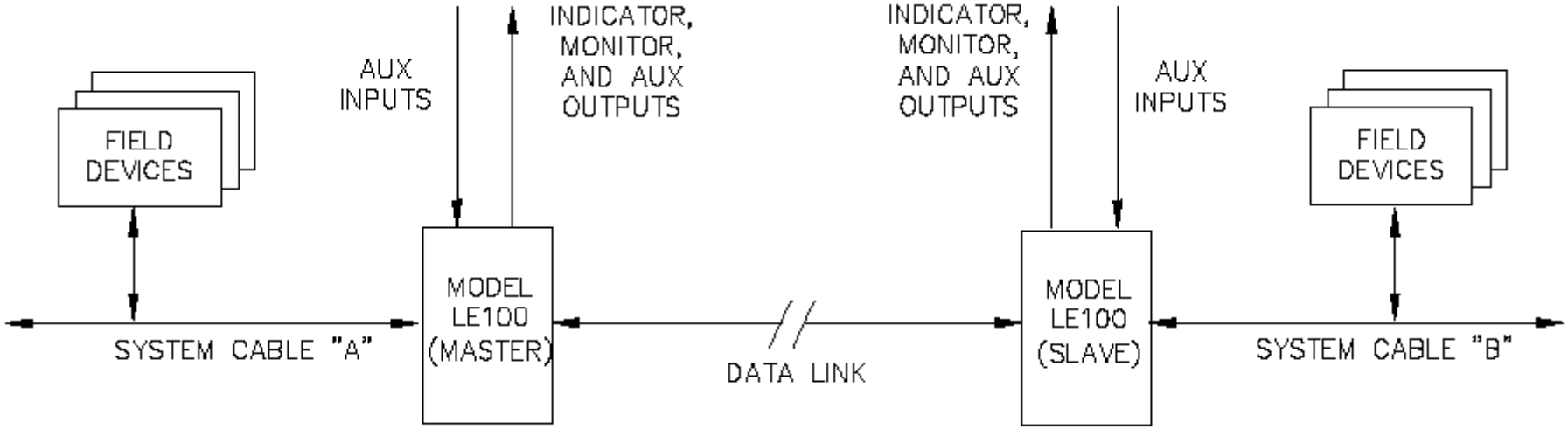
Line Extender - LE100

2006

- Copper or Fiber Transmission Medium
- LE100-FLR operates with single-mode fiber optic cable (9/125 um) connects system cables up to 82 km (51 miles).
- LE100-FSR operates with multi-mode fiber optic cable (62/125 um) connects system cables up to 6.7 km (4.2 miles) apart.
- LE100 - 6,000 feet using two pairs of 22 AWG unshielded twisted-pair (UTP) copper wire, category 3
- Compatible with Page/Party® and SmartSeries®
- Digital Transmission of Audio and Data
- 5 Inputs / 5 Outputs
- Page Line Monitor
- Audio Detector
- Ground Fault Detector

Line Extender - LE100

2006



Line Extender - LE100

2006

LE100 Line Extender

Uses:

- System expansion without overloading the page line
- Connecting remote stations
- Connecting a remote central amplifier

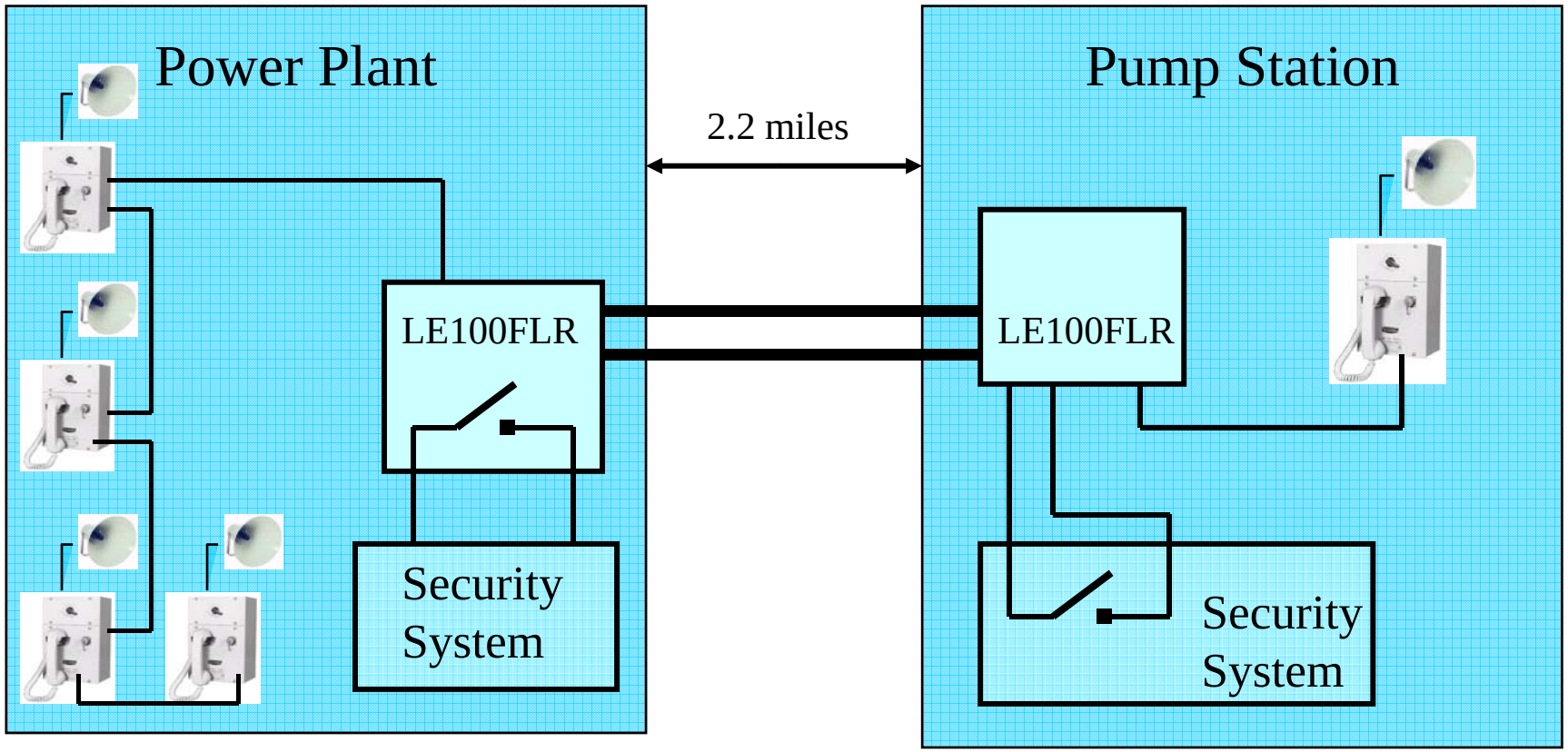
Example:

- A power plant uses cooling water pumped from a river 2 miles away. The LE100 will allow a Page/Party® station at the pumping station to be connected to the plant system.

Line Extender - LE100

2006

LE100 Line Extender



Merge Isolate

2006

MASTER CABINET

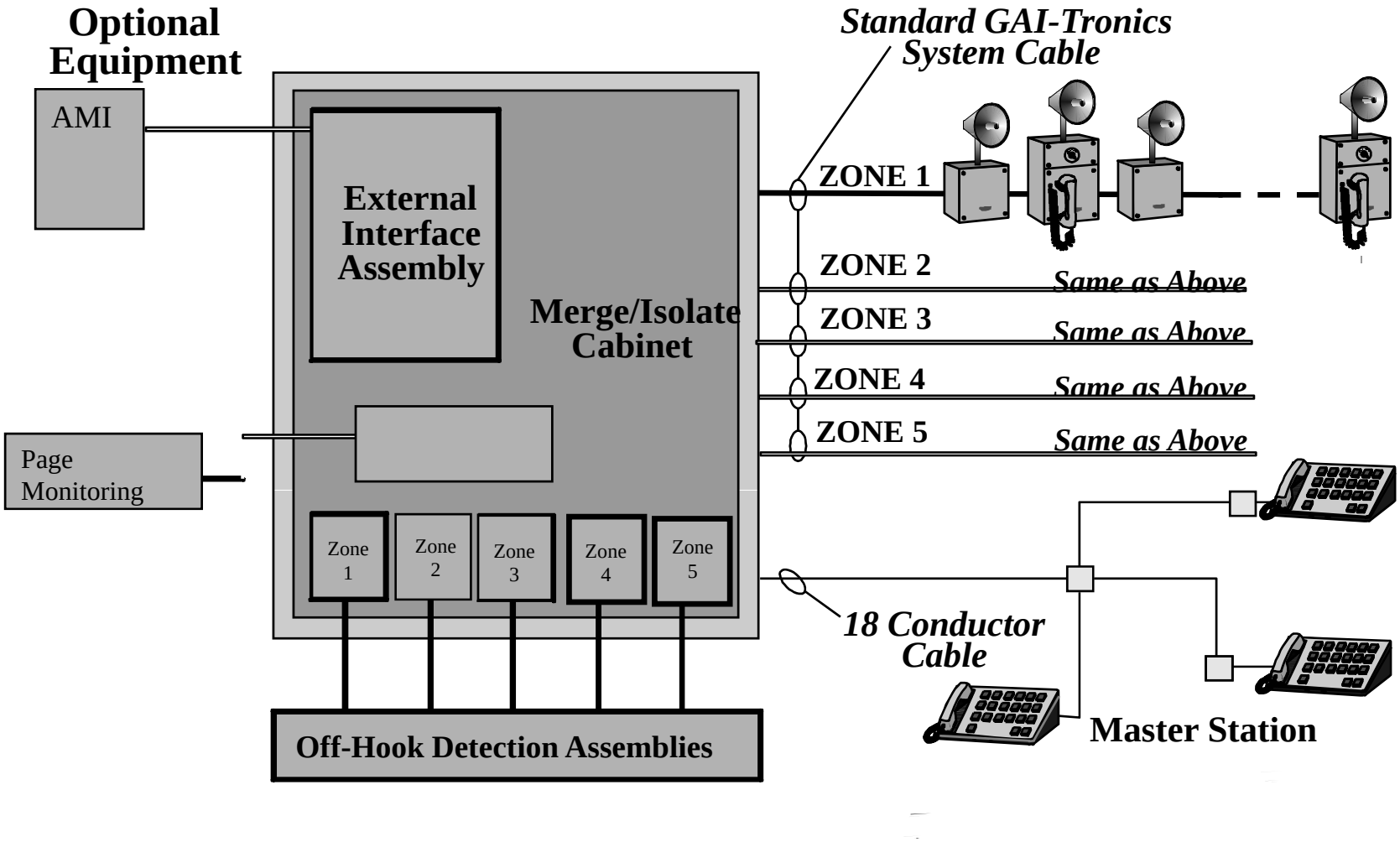
- Merge Isolate Control of up to 5 Zones
- Supports 1-16 Master Stations
- Wall Mount Enclosure
- Merges Page & One Party Line
- Supports Optional Kits and Accessories
- Common Party Lines between Zones
- Compatible with AMI
- Customer Configurable

DESKTOP MASTER

- Monitor Pages
- Merge and Isolate Control of Page and
- Party Lines
- Visual and Audible Call-in
- Activation of Alarms
- Reset of Alarms

Merge Isolate

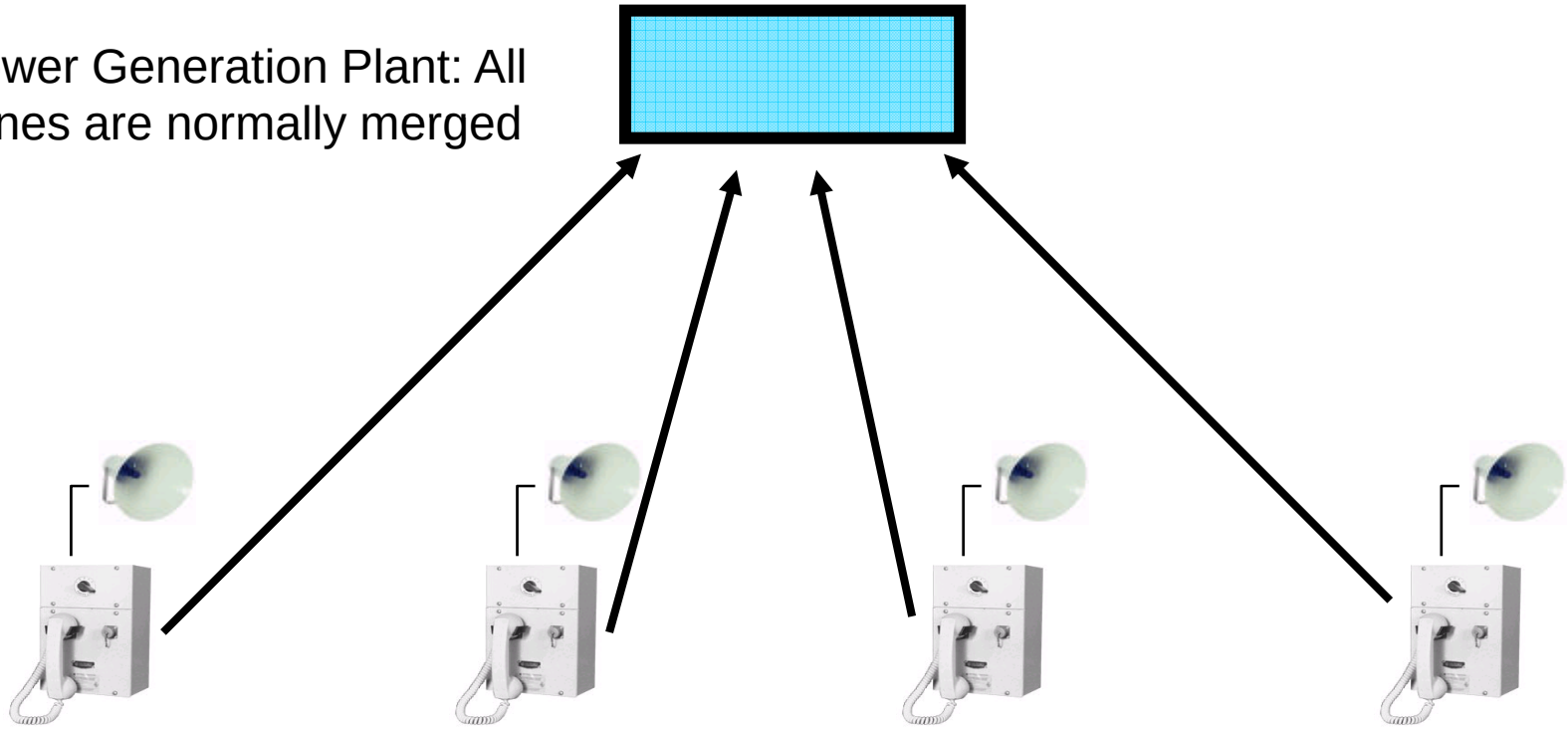
2006



Applications

Merge/Isolate

Power Generation Plant: All zones are normally merged



Zone 1 Zone 2 Zone 3 Zone 4

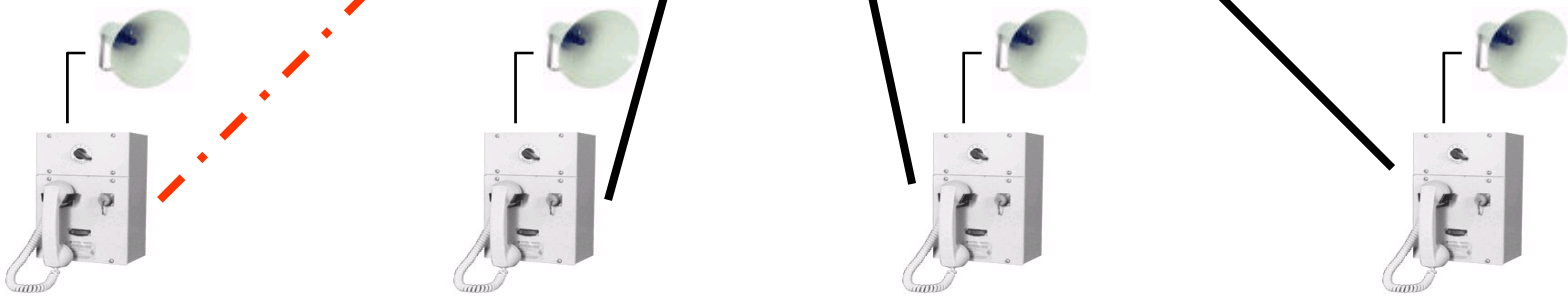
Applications

2006

Merge/Isolate

Power Generation Plant: All zones are normally merged

Zone 1 is down for service - isolated from the other 3 units



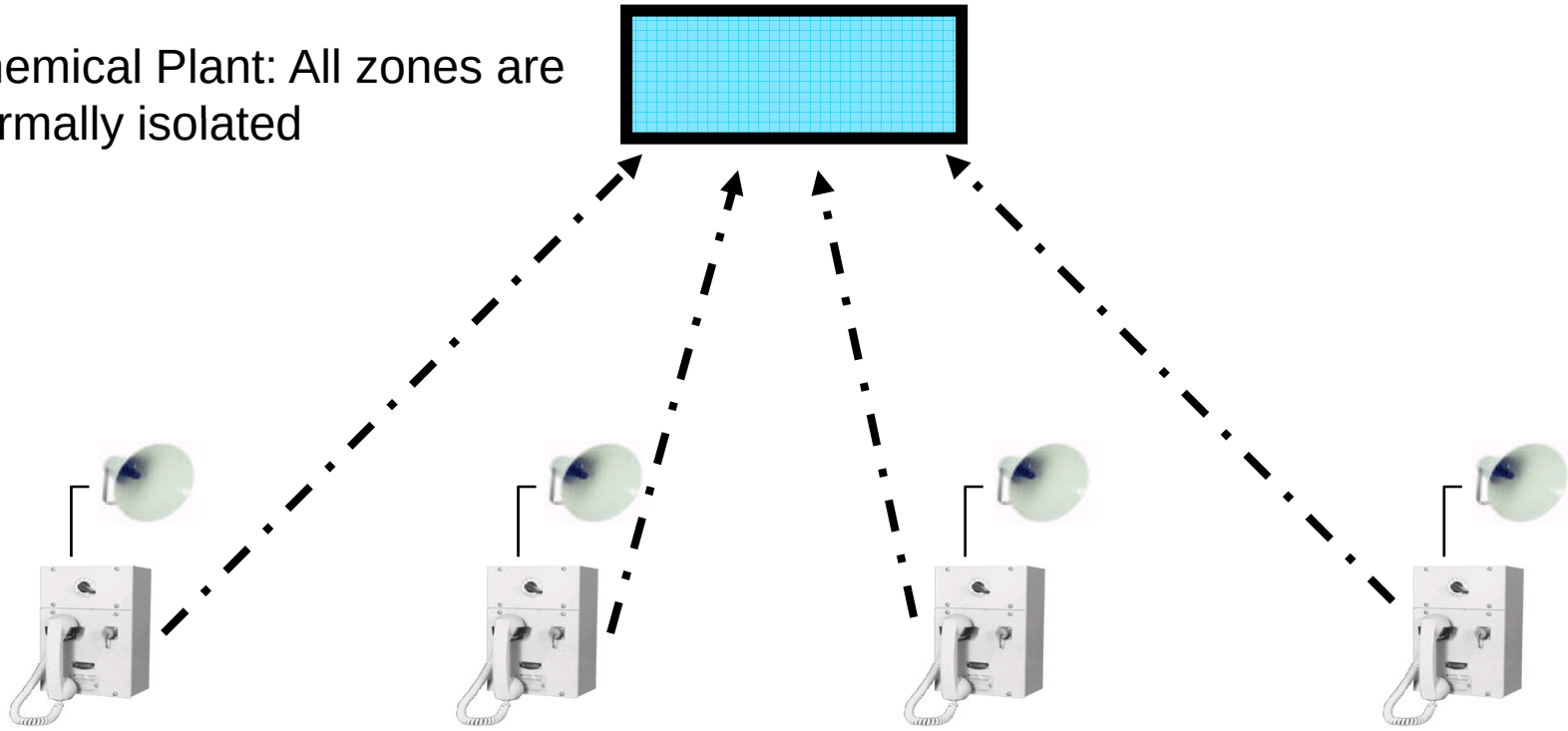
Zone 1 Zone 2 Zone 3 Zone 4

Applications

2006

Merge/Isolate

Chemical Plant: All zones are normally isolated



Zone 1 Zone 2 Zone 3 Zone 4

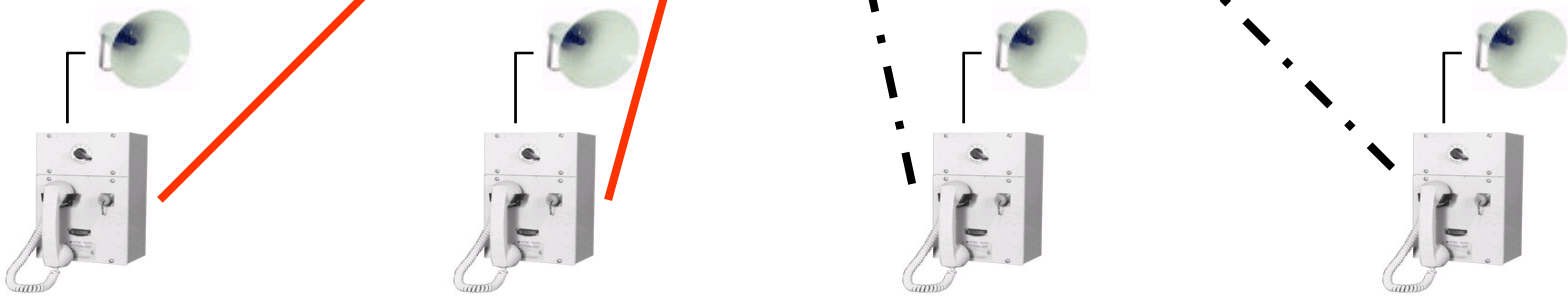
Applications

2006

Chemical Plant: All zones are normally isolated

Merge/Isolate

Zone 1 has a breakdown and their output normally feeds Zone 2. Merge Zones 1 & 2 so they can communicate freely with each other.



Zone 1 Zone 2 Zone 3 Zone 4

Applications

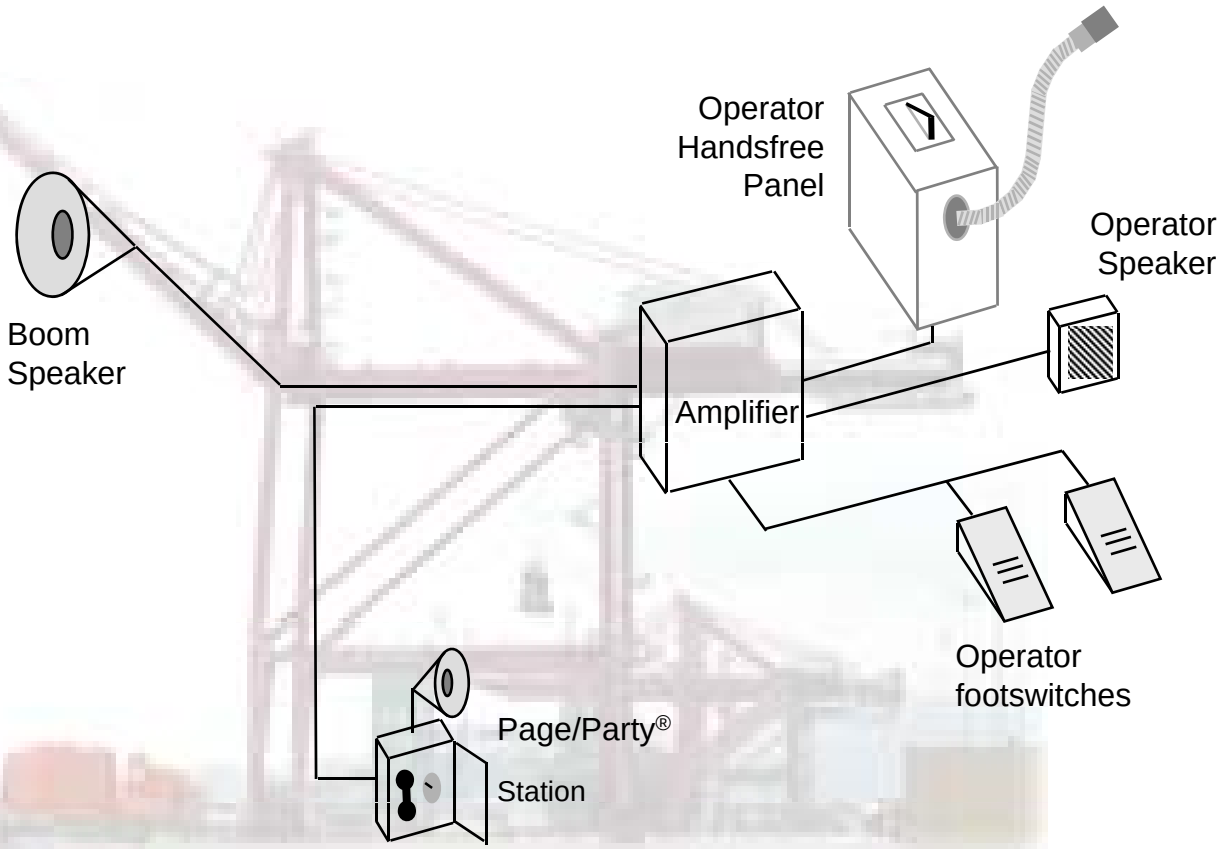
2006

Sea Ports - Crane - Page/Party®

Applications

2006

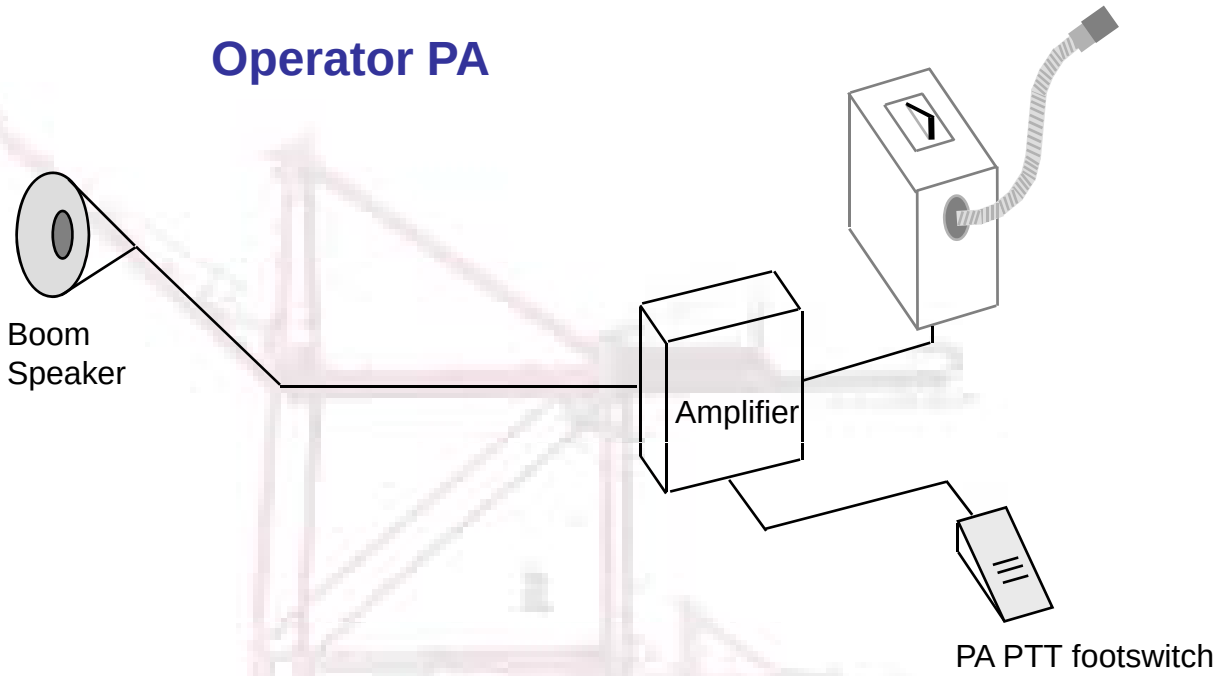
Sea Ports - Crane - Page/Party®



Applications

2006

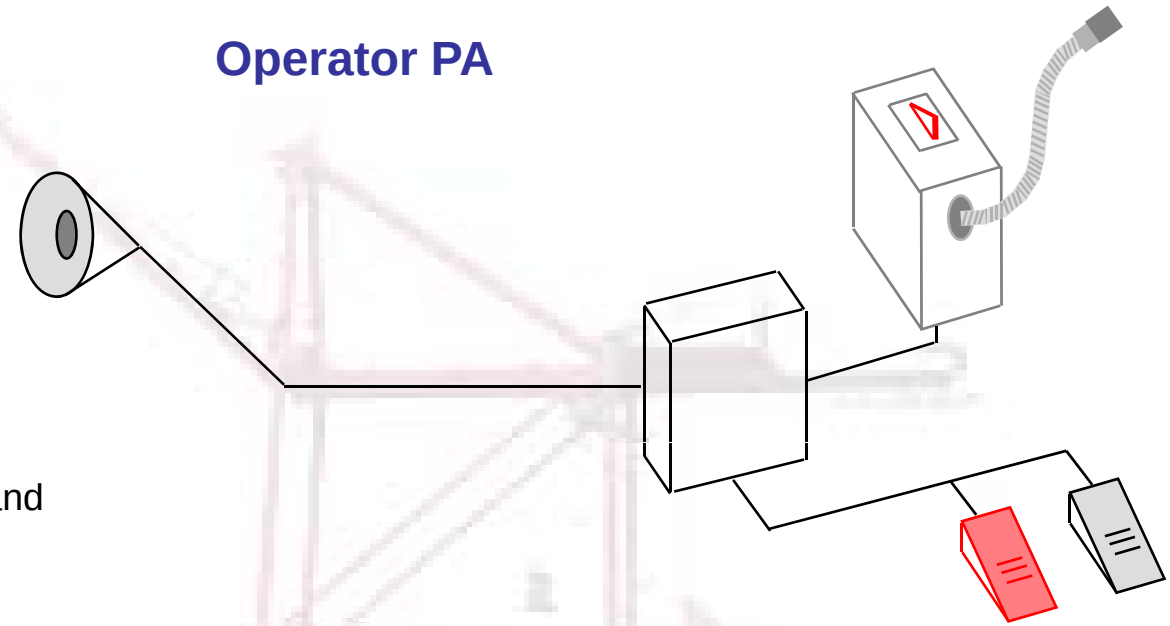
Sea Ports - Crane - Page/Party®



Applications

2006

Sea Ports - Crane - Page/Party®



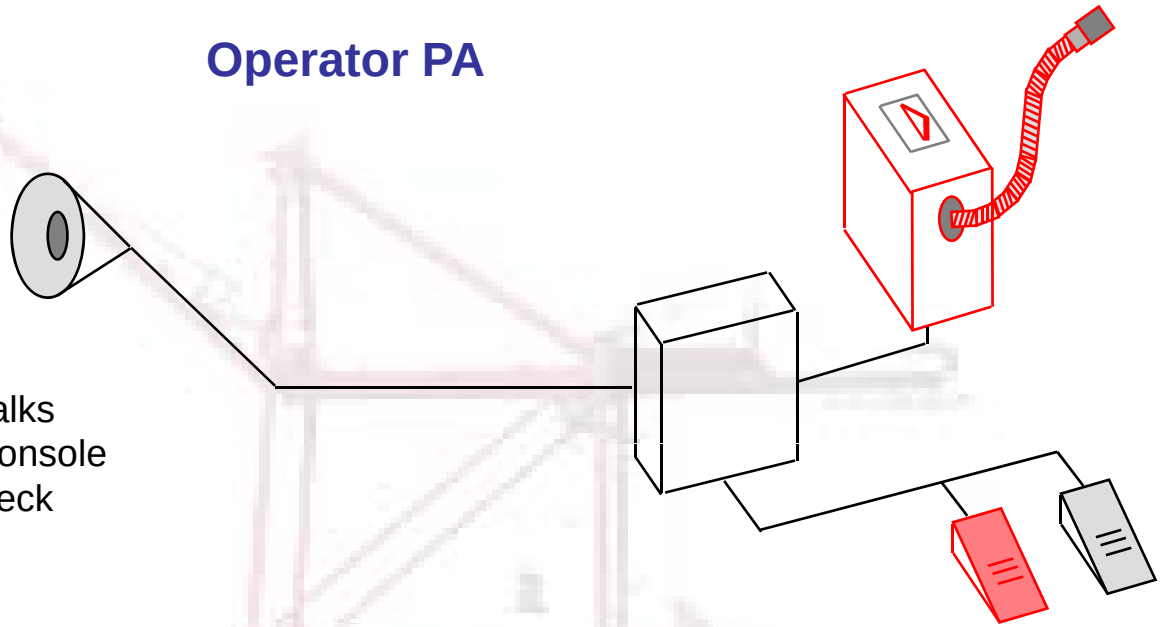
Crane operator initiates call with selector switch and PA press to talk footswitch

Applications

2006

Sea Ports - Crane - Page/Party®

Operator PA

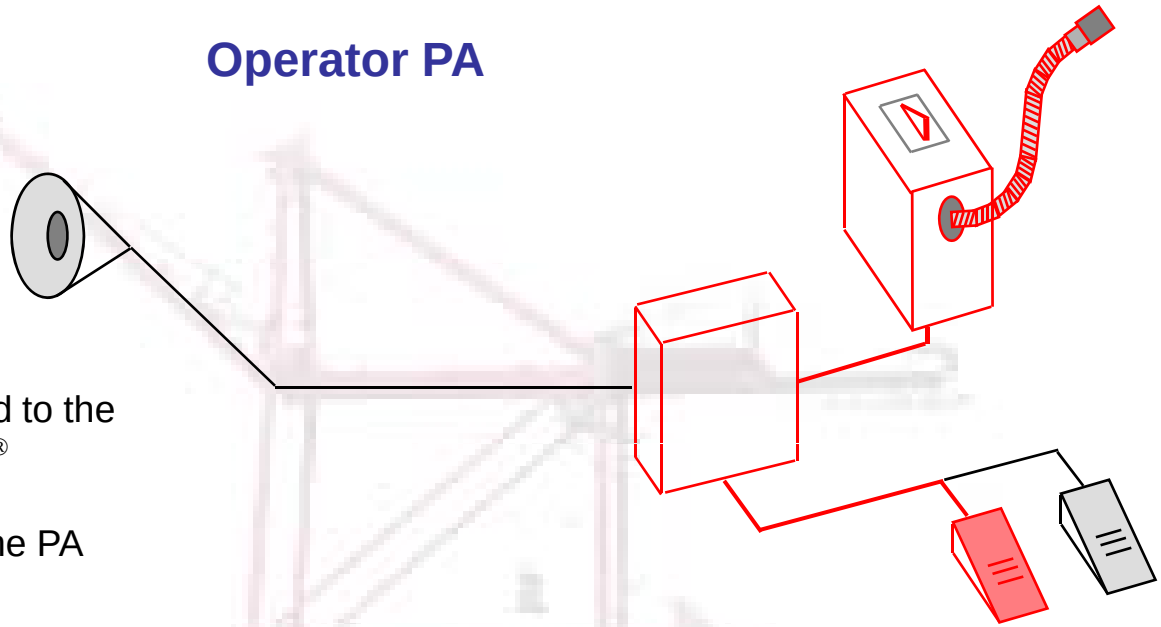


Crane operator talks “handsfree”into console mounted gooseneck microphone

Applications

2006

Sea Ports - Crane - Page/Party®



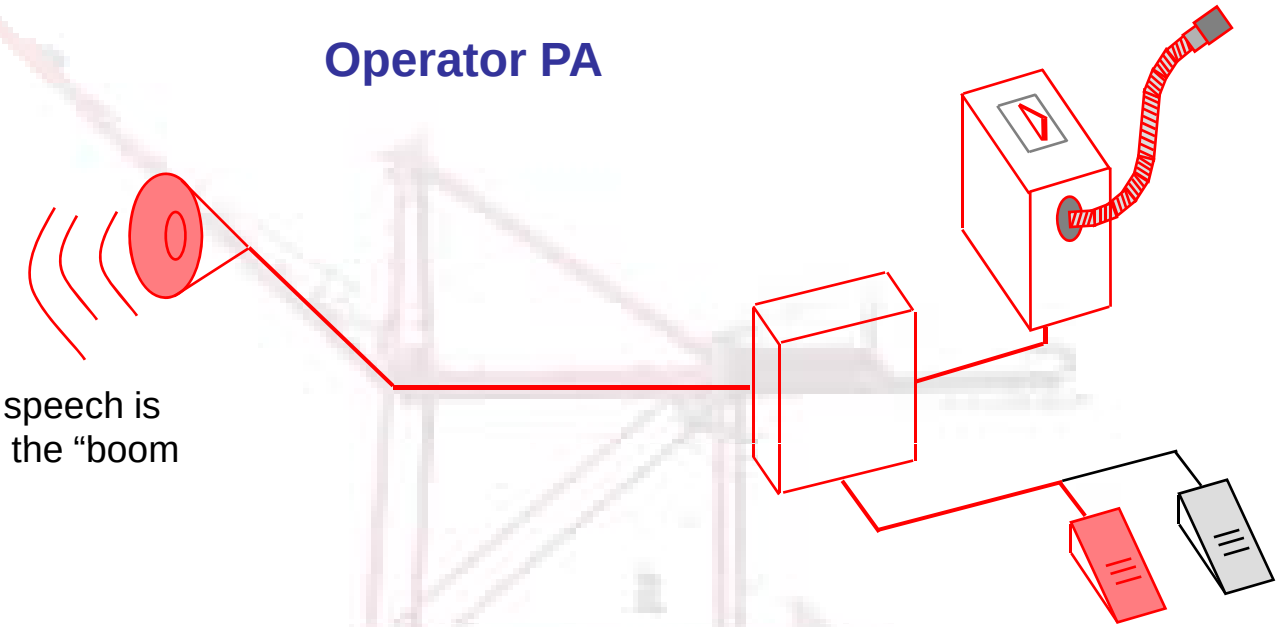
Speech is passed to the local Page/Party® amplifier which is switched on by the PA PTT footswitch.

Applications

2006

Sea Ports - Crane - Page/Party®

Operator PA

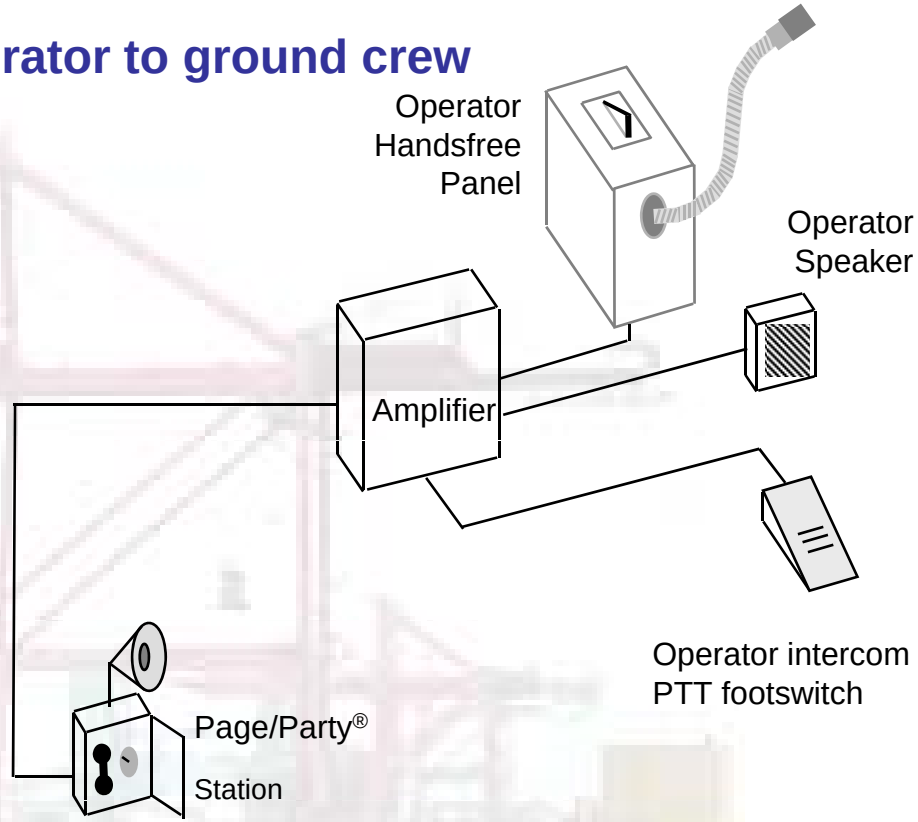


Amplified speech is passed to the “boom speaker”.

Applications

2006

Sea Ports - Crane - Page/Party®



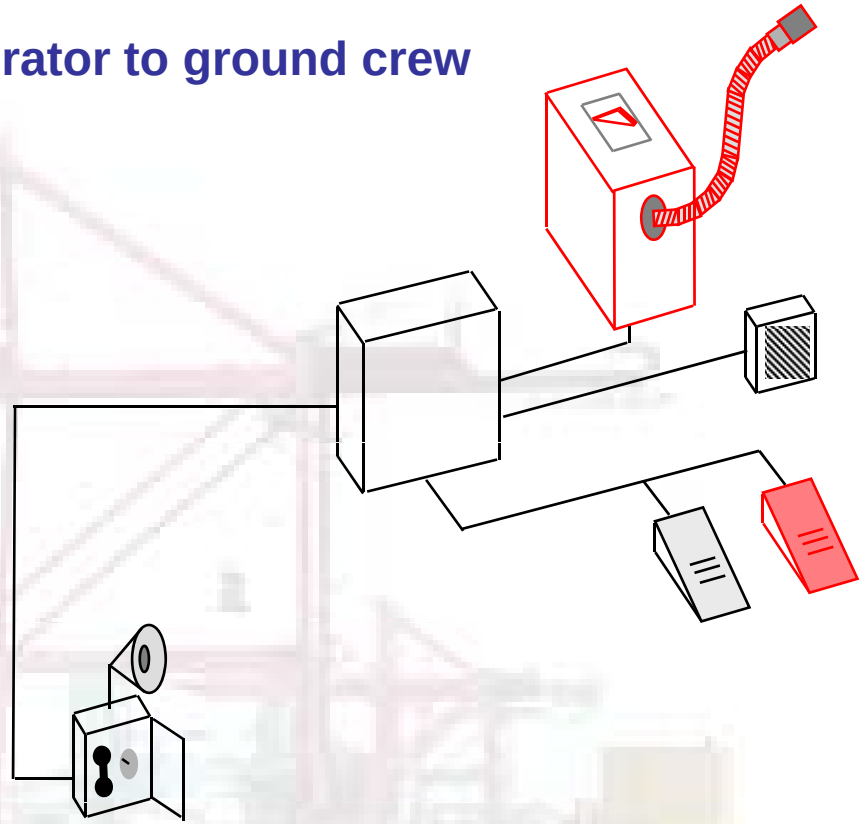
Applications

2006

Sea Ports - Crane - Page/Party®

Operator to ground crew

Crane operator initiates call with selector switch and Page/Party press to talk footswitch



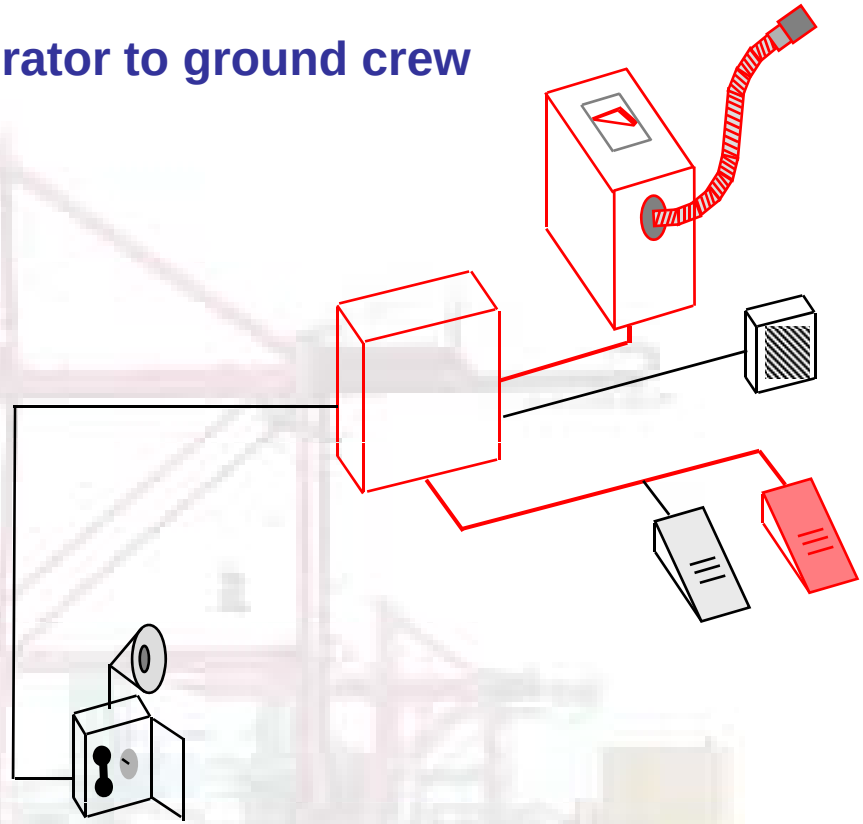
Applications

2006

Sea Ports - Crane - Page/Party®

Operator to ground crew

Speech is passed to the local Page/Party® amplifier which is switched on by the Page/Party PTT footswitch.



Applications

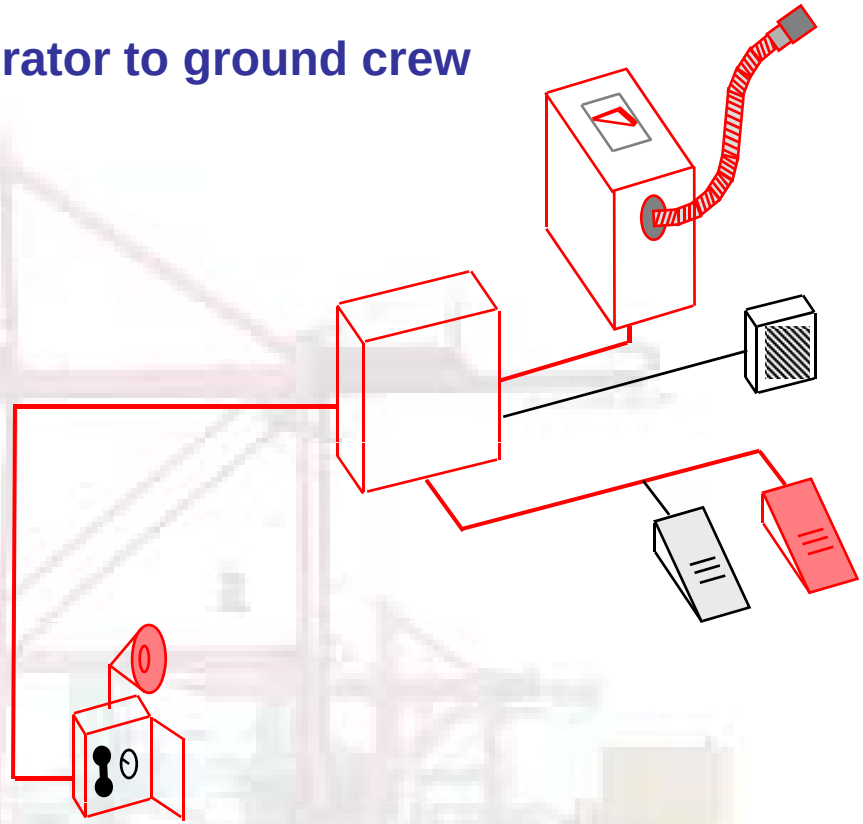
2006

Sea Ports - Crane - Page/Party®

Operator to ground crew

Page is heard at all Page/Party stations.

Operator is able to then party line connect to stations.

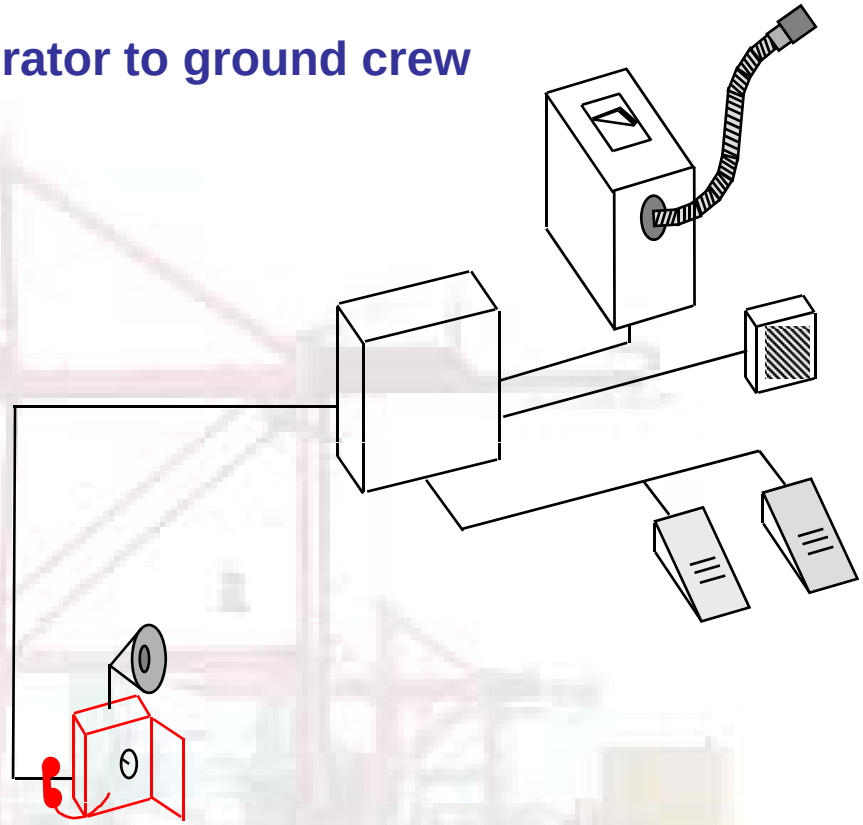


Applications

2006

Sea Ports - Crane - Page/Party®

Operator to ground crew



Ground crew lifts
handset and pages

Applications

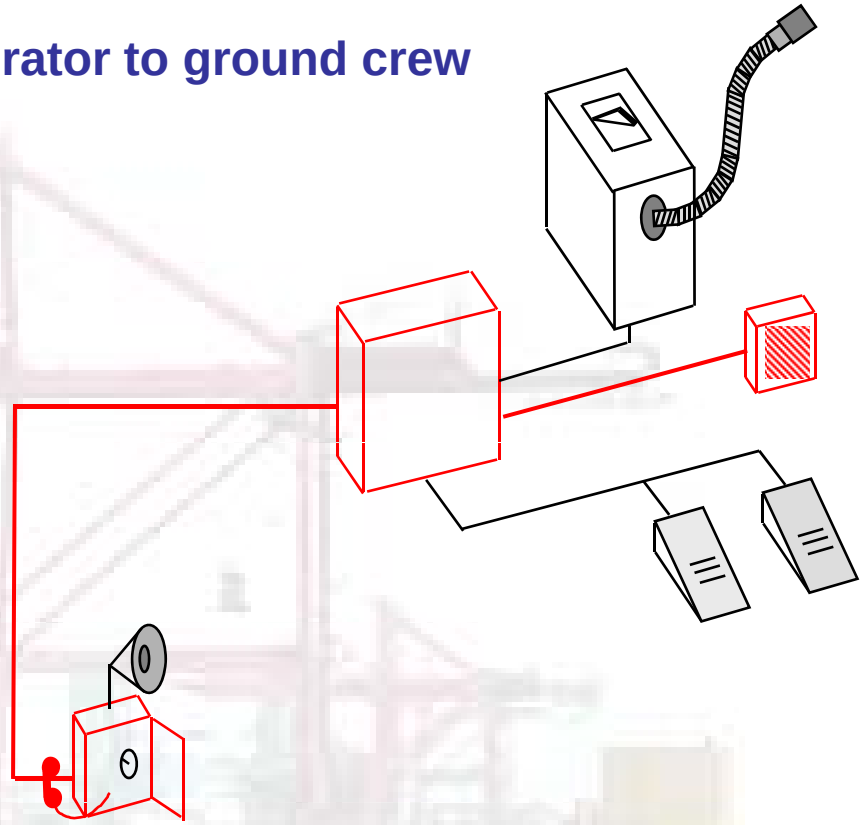
2006

Sea Ports - Crane - Page/Party®

Operator to ground crew

Audio is routed via the crane operators Page/Party amplifier to a local speaker.

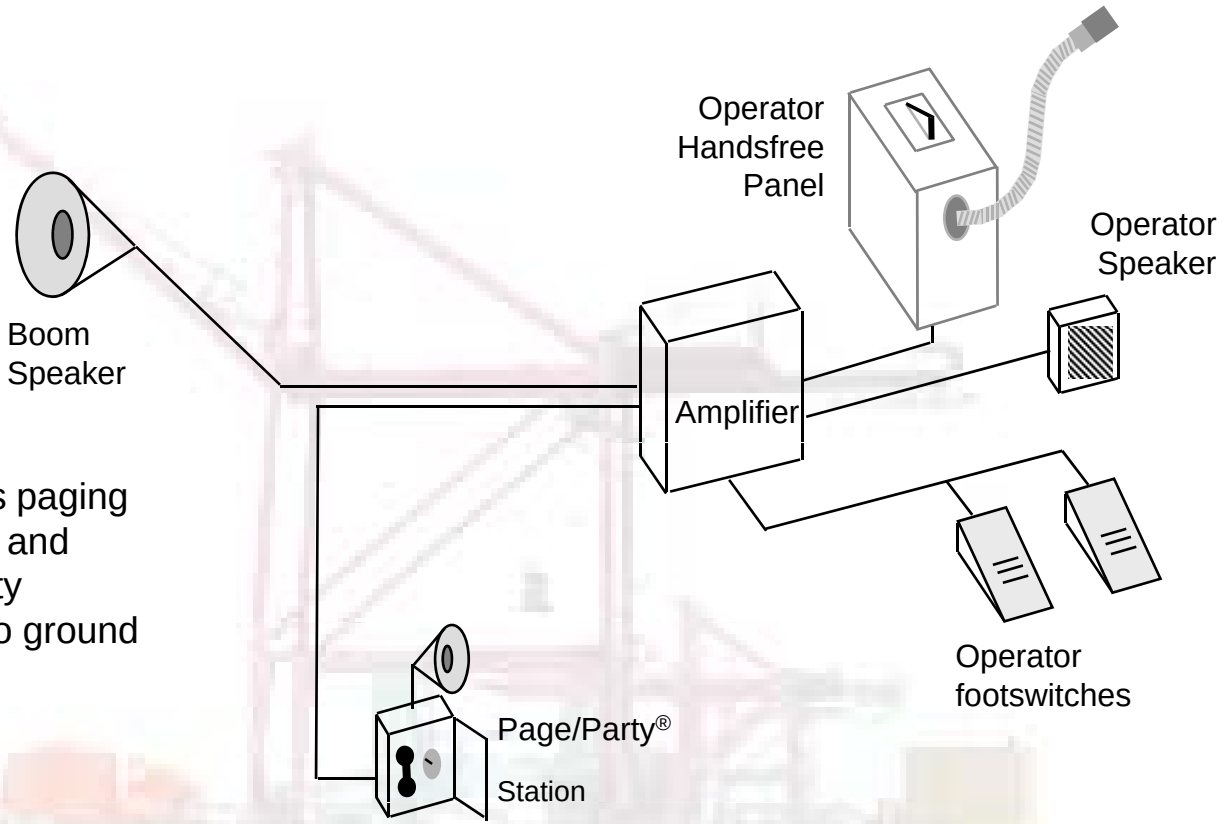
Crane operator may then converse with ground crew



Applications

2006

Sea Ports - Crane - Page/Party®



System provides paging to the boom, and Page/Party communication to ground crew.

Cable Introduction

2006

GAI-Tronics Cables are specially designed to optimize GAI-Tronics' communication system performance.

System Cable carries power, page and party (audio), ground and control for easy expansion.

Speaker Cable connects loudspeaker(s) to stations.

Cable Overview

2006

Standard Cable - 60029-101

Power Conductors

- 1 twisted pair of # 14 AWG copper
- 1 single for ground

Audio Conductors

- 6 twisted pair #18 AWG copper
- 1 # 18 AWG control
- 16 Conductors Total

Cable Overview

2006

Armored Marine Grade Cable - 60029-108

Power Conductors

- 1 twisted pair of # 14 AWG copper
- 1 single for ground

Audio Conductors

- 6 twisted pair #18 AWG copper
- 1 # 18 AWG control
- 16 Conductors Total

Cable Features

2006

- Cable pairs are twisted with systematic, varying lays to minimize crosstalk
- Color Coded to simplify installation
- PVC (Polyvinyl Chloride) insulation jacket
- UL listed (Subject 1277 for indoor/outdoor and direct burial installation)
- IEEE-45 Marine Shipboard Standards
- UL 1580 Marine Shipboard Cable
- American Bureau of Shipping

Speaker Overview

2006

GAI-Tronics designs loudspeakers especially for the reproduction and broadcast of voice communications.

GAI-Tronics Loudspeakers are designed for use in industrial and commercial locations.

GAI-Tronics Loudspeakers provide extremely high intelligibility and efficiency in the speech frequency range.

Speaker Overview

2006

Speakers available with integral or separate drivers.

Loudspeakers requiring a separate driver are generally referred to as horns.

A driver converts the electrical source signal to a sound pressure signal and passes it on to a horn which amplifies and projects this signal.

13350

13314-xxx

13302-xxx

System Design

1.) Determine primary (and secondary) functions for the system:
- Process communication
- Emergency notification
- Speech intelligibility

2.) Determine *distributed* loudspeaker coverage, based on population and usage.

3.) Determine call points; that is, handset stations, access panels, master stations, auxiliary inputs (such as telephone interface or radio interface)

4.) Determine central control cabinet system requirements to support the system requirements.

System Design

- Determine minimum system requirements, based on functionality and appropriate design standards. Refer to Technical Support inserts which accompany this seminar program.

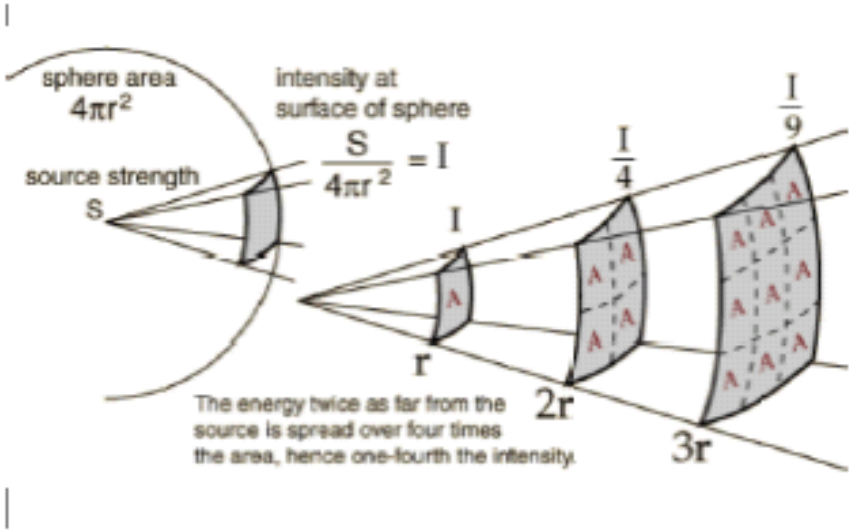
- American Bureau of Shipping - Part 4, Chapter 8, Section 2
- Code of Federal Regulations 46 Subpart 113.25 - General Emergency Alarm Systems
- Code of Federal Regulations 46 Subpart 113.50 - Public Address Systems
- Code of Federal Regulations 29 1910 OSHA; 1910.38, 1910.120, 1910.165 - General Emergency Alarm Systems

Properties of Acoustics

2006

- Based on the inverse square law, when the power to a speaker is doubled, the output level increases by 3dB, i.e. change in power in dB = 10(log P1/P2)
- When the distance from a speaker is doubled, the audio is reduced by 6dB, i.e. change in distance in dB = 20(log D1/D2)

$$\triangle I(dB) = 10\log_{10}[I / I_0]$$



Loudspeaker Placement

2006

- Ambient noise levels are critical to comprehension of voice messages. LQ=50dB, Production=85dB, Drill Floor=95-105dB
- Tones are repetitive with constant levels, the human voice changes with each individual. Tones with prerecorded speech are the best alarms as the tone will be heard through ear protection to get a person's attention.
- Automatic volume adjustment will compensate for fluctuating ambient noise levels.
- Hearing protection reduces medium to high frequency noise by 15-25 decibels.
- Loudspeakers should be mounted 10 to 12 feet above the floor.
- Hazardous area speakers have a flame arresting scinter that reduces audio output levels. Locate speakers in CI,D2 locations directed towards CI,D1 areas to lower costs where possible.

Loudspeaker Placement

As you move away from a sound source, the sound pressure level drops (attenuates) roughly 6 dB each time distance is doubled from the source. Therefore, if the loudspeaker and the noise source are very close together, both loudspeaker output and noise source will attenuate at the same rate, maintaining the proportional signal-to-noise ratio.

Avoid directing loudspeakers directly at each other. When the distance between loudspeakers exceeds 40 feet, the human ear can perceive the 40 mS time delay rendering the system unintelligible.

Loudspeaker Placement

2006

32m 16m 8m 4m 2m 1m

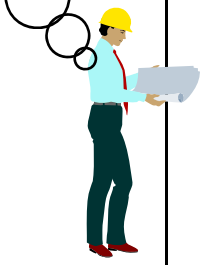
83 dB 89 dB 95 dB 101 dB 107 dB 113 dB

That page is too loud!

Heard the alarm whistle and the message OK!

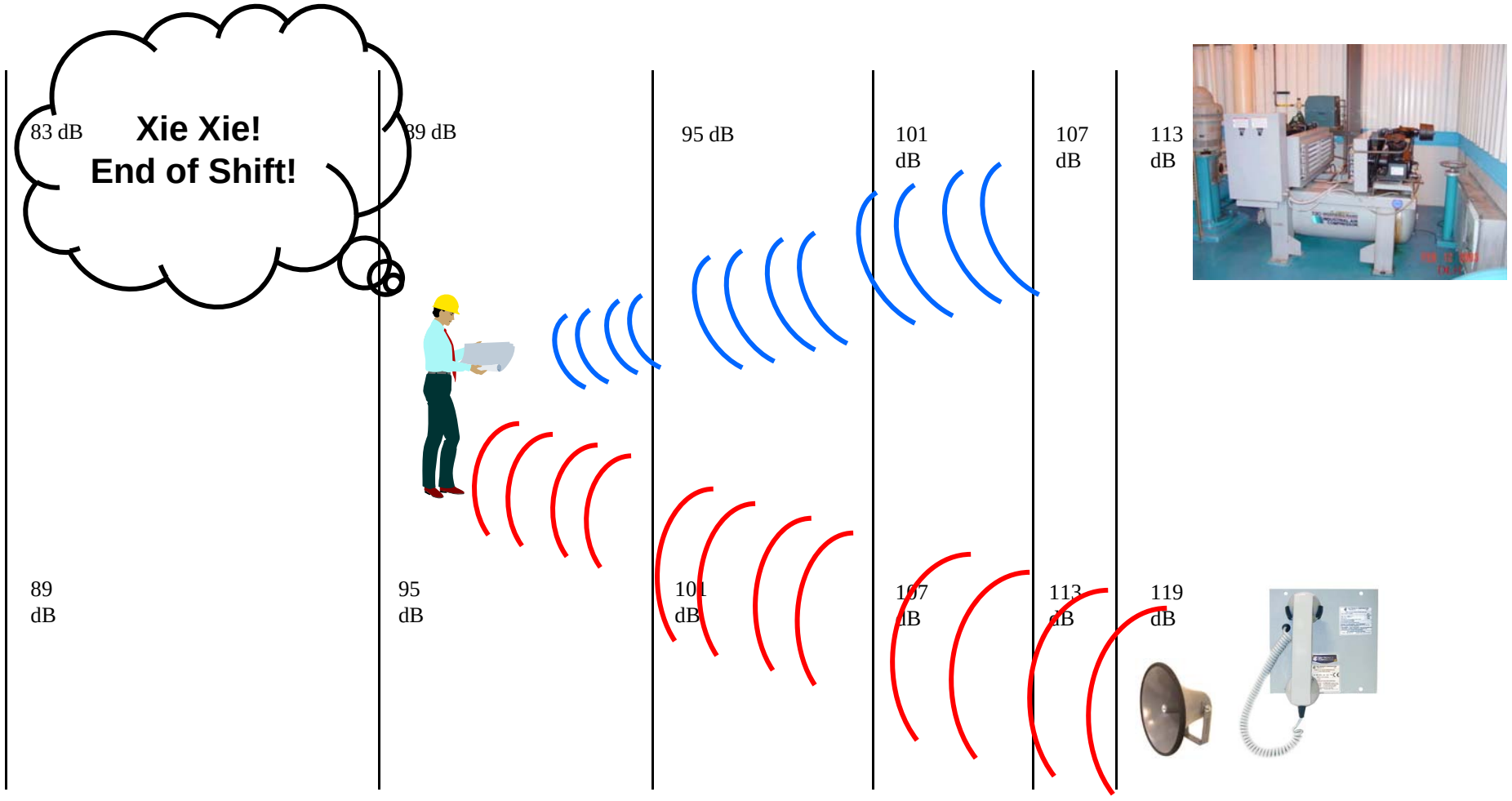
Now I can't hear anything!

119 dB 113 dB 107 dB 101 dB 95 dB 89 dB



Loudspeaker Placement

2006



Loudspeaker Placement

2006

- To meet minimum speech intelligibility and coverage requirements, particular attention must be given to each loudspeaker:
  - Location
  - Population
  - Orientation

- Loudspeaker location, population and orientation is based on several factors, such as:
  - Ambient noise levels
  - Location of noise sources
  - Coverage to maintain 10 dB SPL above ambient in compliance with OSHA and ABS recommendations
  - Alarm tones only, or alarms with Speech messages
  - Voice pages only

QUESTIONS ???

GAI-Tronics®

2006

60 Years

Loud and Clear For Sixty Years.