



➤ INTRODUCTION

The purpose of this guide is to provide information concerning the general operation and proper application of Fike's Integrated Emergency Communication System (ECS). It briefly outlines the basic operating principles and design options that you will need to consider when quoting or designing a Fike voice system. The information provided in this application guide is very high level and does not show all components necessary to form a complete voice system. Refer to the product documentation supplied with each component for further details.

For reference purposes, this guide will illustrate three different ways that Fike's voice system can be applied to a ten (10) story hotel that requires automatic evacuation of the fire floor and alert notification of the floor above and below the floor of incident.

➤ AUDIO SUBSYSTEM COMPONENTS

Fike's audio subsystem is designed such that the individual components can be seamlessly integrated into the CyberCat™ fire alarm system architecture. The following components form the back-bone of the audio subsystem:

FCC Digital Paging Assembly is the primary paging component of the audio subsystem and is the only audio component required to be installed in the fire command center enclosure. The paging assembly provides the following features: primary source of the audio system's network audio riser; connection point for the system's primary paging microphone; connection point for the system's primary firefighter's telephone; and provides the primary switches for manual operation of the voice system: Page to Alert, Page to EVAC, Page to ALL, Page to All Record and Repeat, and six configurable switches.

LOC Digital Paging Assembly adds remote paging capabilities to the audio subsystem and is included as an integral part of LOC enclosure assemblies. The remote paging assembly provides the following features: connects to the system's network audio riser, connection point for remote microphone assembly; and provides thirteen configurable switches for manual operation of the voice system.

Zoned Amplifiers are distributed throughout the system and provide the storage and amplification of all prerecorded audio messages (maximum 16 messages). Amplifiers are designed to feed a single audio zone (50 watts max.) and provide an integral 24VDC notification appliance circuit. Each amplifier is equipped with four supervised Class A or B speaker circuits configurable for 25 or 70 Vrms output. Each amplifier is connected to the CyberCat™ panel's RS485 peripheral bus and the digital paging assembly's network audio riser. All command and control signals for the system amplifier(s) is distributed over the peripheral bus; whereas live pages are distributed to the system amplifier(s) over the network audio riser.

SWITCH CARDS provide manual control of the audio subsystem and can be added to suit your specific project requirements. Available switch cards include: FCC paging control card, LOC paging control card, Input/Output switch card, and six zone audio control card.

NETWORK AUDIO RISER consists of a single cable run connecting all paging assemblies and amplifiers together in a Class A configuration. This connection allows live pages to be distributed to any amplifier connected to the network.

➤ **SYSTEM OPERATION**

Operation of the audio subsystem can be accomplished automatically based on the operation of the CyberCat™ system and/or manually based on the press of a switch configured for voice operation. A brief description of each operation mode (automatic or manual) is described as follows.

AUTOMATIC OPERATION of Fike's audio subsystem is based on the CyberCat™ panel's standard Zone and State relationship. During system configuration, each of the CyberCat™ panel's alarm zones can be mapped to other alarm zones (zone mapping) to facilitate automatic initiation of EVAC signals within the affected zone(s) and initiation of Alert signals within adjacent zones; thus allowing selective evacuation and notification of the building occupants.

Each amplifier card must be programmed to activate its four speaker circuits based on the operational state of a specific zone (1-253). Each operational state is assigned a priority level as shown in the table below. These priorities are embedded in the CyberCat™ panel and cannot be changed. When an event occurs, the CyberCat™ panel will determine the highest priority state for the affected zone and will instruct each amplifier as to which canned audio message to play (1 - 16) in response to the event.

Operational State	Priority
DRILL	1
EVAC	2
Alert	3
Alarm	4 (initiates EVAC and Alert)
Test Alarm	5
Supervisory	6
Process	7

CYBERCAT STATE PRIORITY TABLE

Each operational state can be assigned a different canned audio message that will be played in response to the event; however, each amplifier is only capable of playing a single audio message at one time (single channel audio). When more than one event occurs in a single zone, the amplifier assigned to that zone will play the audio message assigned to the operational state with the highest priority, as indicated in the table above.

MANUAL OPERATION of Fike's audio subsystem is controlled by the activation of a switch configured to perform any of the following voice functions:

1. *Voice Alert* – when pressed, the panel places the assigned zone(s) into Alert mode. All amplifiers assigned to the selected zone(s) will turn on and begin to play the stored Alert message.
2. *Voice EVAC* – when pressed, the panel places the assigned zone(s) into EVAC mode. All amplifiers assigned to the selected zone(s) will turn on and begin to play the stored EVAC message.
3. *Voice Page* – when pressed, all amplifiers assigned to the selected zone(s) will turn on and broadcast the live page being delivered over the network audio riser.
4. *Voice Record Page* – when pressed, all amplifiers assigned to the selected zone(s) will turn on and broadcast the live page being delivered over the network audio riser. In addition, the amp will record the live page into its onboard memory and then will repeat the recorded message over and over once the microphone is released.
5. *Voice Page To Alert* – when pressed, all amplifiers currently in Alert mode will switch to Page mode and will broadcast the live page being delivered over the network audio riser.
6. *Voice Page To EVAC* – when pressed, all amplifiers currently in EVAC mode will switch to Page mode and will broadcast the live page being delivered over the network audio riser.
7. *Voice Play Message ID* – when pressed, all amplifiers assigned to the selected zone(s) will play the assigned audio message ID (1 – 16) that is stored in the amplifier.
8. *MNS Page* – when pressed, all amplifiers assigned to the selected zone(s) will turn on and broadcast the live page being delivered over the network audio riser.
9. *MNS Record Page* – when pressed, all amplifiers assigned to the selected zone(s) will turn on and broadcast the live page being delivered over the network audio riser. In addition, the amp will record the live page into its onboard memory and then will repeat the recorded message over and over once the microphone is released.
10. *MNS Play Message ID* – when pressed, all amplifiers assigned to the selected zone(s) will play the assigned audio message ID (1 – 16) that is stored in the amplifier.

The CyberCat™ system utilizes control priority levels to resolve which switch has operational priority over another switch that is programmed for the same operation. A switch with a lower priority setting cannot override a switch with a higher priority. Switches with the same priority setting can override another switch with the same priority setting or a lower priority setting. Each switch must be assigned a priority level from 0 to 254 using the CyberCat™ panel's configuration software C-Linx. A setting of 0 disables the switches control priorities. A setting of 1 give the switch the highest priority and a setting of 254 give the switch the lowest priority. In most cases, manual activation of the voice system via switch operation will override the systems automatic operation.

➤ DESIGN OPTIONS

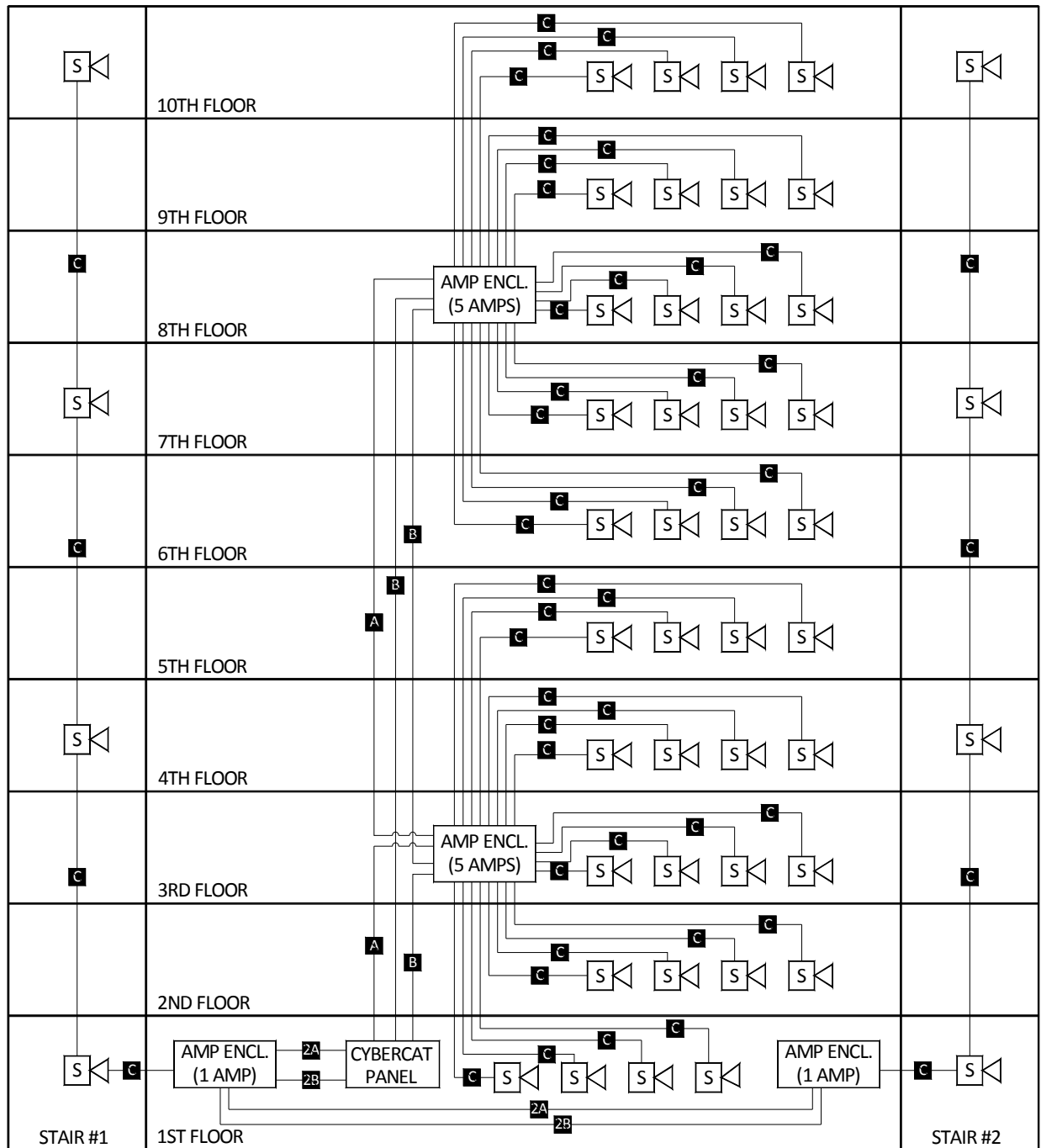
Fike's integrated ECS system can be designed for **Single Channel**, **Dual Channel** or **Page Only** system operation. Selection of which option best suits your project will depend upon how the customer wants the system to operate. A description of each design option and how it is applied to a typical installation (in this case a ten story hotel) is provided below:

• SINGLE CHANNEL SYSTEM

In a single channel system, individual amplifiers are distributed throughout the hotel with each amp serving a single, continuous audio/paging zone (i.e. single floor, stairwell, elevator cabs, etc.). This configuration provides the following features and functions:

- A. Each amplifier can be configured to play area (zone) specific messages in response to the following system events: Drill, EVAC, Alert, Alarm, Test Alarm, Supervisory, and Process.
- B. Each amplifier can supply a total of 50 watts maximum to its four (4) speaker circuits.
- C. Capable of executing the following page functions during normal and alarm operation: Page to selected Zone(s); Record and Repeat Page to selected Zone(s); Page to Alert; Page to EVAC; MNS Page to Zone(s); MNS Record and Repeat Page to selected Zone(s).
- D. One or all of the amplifier's four speaker circuits can be utilized to distribute audio throughout the zone; however, all four circuits must be assigned to a single zone. *Individual zoning of the amplifier's four speaker circuits is NOT allowed on a single channel system.*
- E. If a speaker circuit is physically not going to be used, the circuit can be disabled.

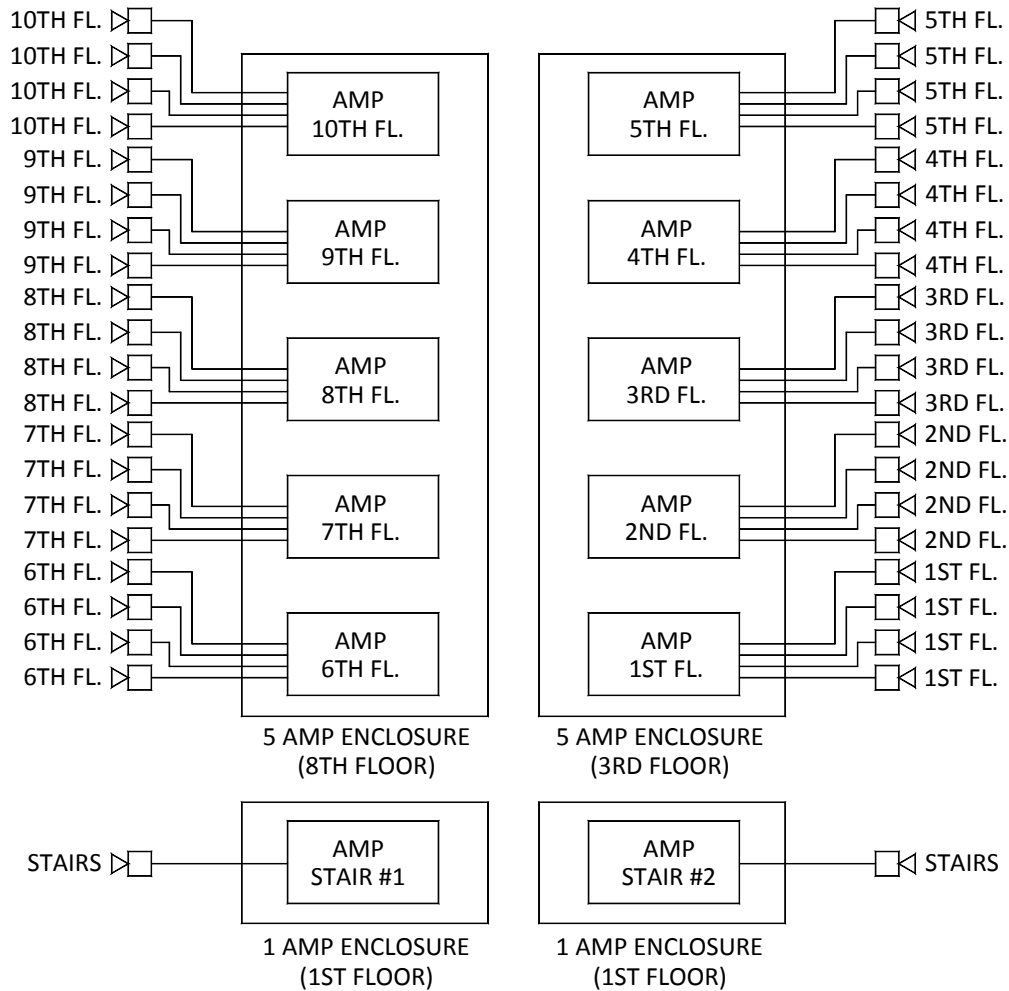
The example shown on the next page depicts a typical single channel system layout, where individual amplifier cards have been installed to serve each floor and each stairwell of the hotel. This configuration provides zoned evacuation and selective paging capabilities by providing an amplifier for each individual notification/paging zone. In this application example, all four of the amplifier's speaker circuits are being utilized to connect to the system speakers. An alternate method would be to utilize a single circuit to connect to the system speakers (max. 50 watts).



- A** RS485 PERIPHERAL BUS
- B** AUDIO RISER
- C** SPEAKER CIRCUIT

EXAMPLE OF A TYPICAL SINGLE CHANNEL SYSTEM

Fike offers several enclosure options for mounting the system amplifiers, ranging from a single amp enclosure to a five amp enclosure for larger applications. In this application example, the amplifier cards serving each floor of the hotel are centrally located in two five amp enclosures located on the 3rd and 8th floors. Two, single amp enclosures with amp are installed to service the stairwells.



AMPLIFIER ENCLOSURE LAYOUTS

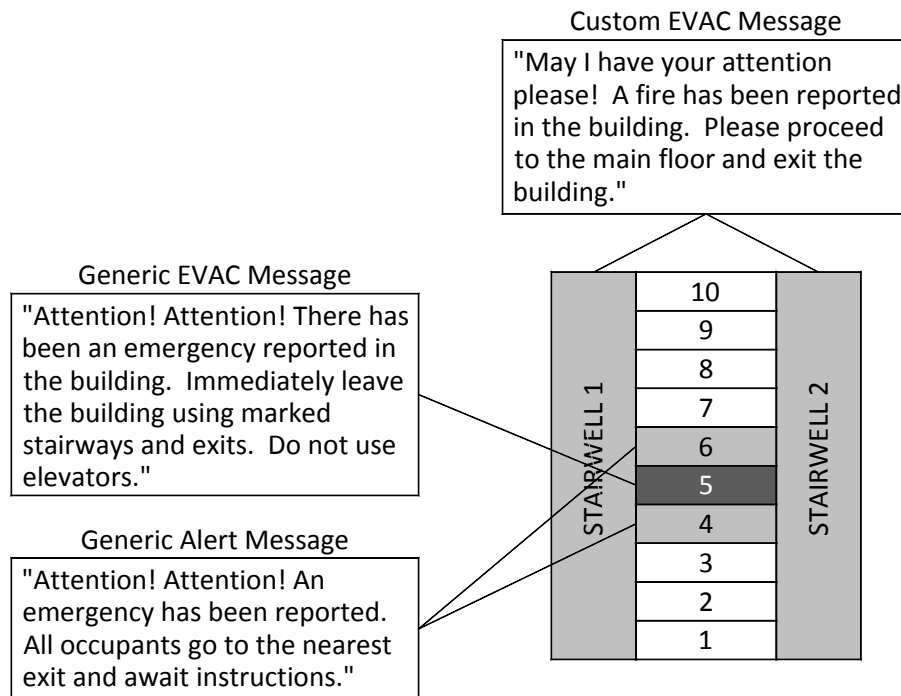
The following equipment list is very high level and does not reflect all components necessary to form a complete ECS system:

1. CyberCat™ control panel (254 or 1016), Qty. 1
2. Digital paging assembly, P/N 10-2751, Qty. 1
3. Single amplifier enclosure, P/N 10-2797, Qty. 2
4. Five amplifier enclosure, P/N 10-2755, Qty. 2
5. Amplifier kit, P/N 10-2773, Qty. 12

OPERATION

In response to an Alarm event on the 5th floor, the amplifier serving the 5th floor and its associated speaker circuits will turn on and begin to play the prerecorded EVAC message. Based on zone mapping, the amplifiers serving the 4th and 6th floors and their associated speaker circuits will turn on and begin to play the prerecorded Alert message. Amplifiers serving the stairwells will turn on and play a custom message that is different from the standard EVAC and Alert messages played on each floor. Amplifiers in non-affected areas will not turn on. See example below.

Should the fire condition spread, amplifiers in adjacent areas will automatically change from playing the Alert message to the EVAC message and amplifiers in adjacent zones not previously involved in the notification process will begin to play the Alert message in response to the spread of the fire.



EXAMPLE OF EVAC AND ALERT OPERATION ON A SINGLE CHANNEL SYSTEM

① Salesmen/Designer Note: To determine the total number of amplifiers required for a single channel system, you must first determine the total number of individual paging zones/areas (i.e., stairwells, elevator cabs, individual floors, etc.) that your system requires. Next you will need to verify that the total wattage output of the speakers connected to any single amplifier does not exceed 50 watts. If it does, additional amplifiers will be needed. Next, you will need to perform voltage drop calculations on each speaker circuit to determine if the voltage drop is too great. If it is, consider moving the amplifier(s) closer to the area served, increase the size of the wiring used on the speaker circuit(s), or install additional amplifier cards.

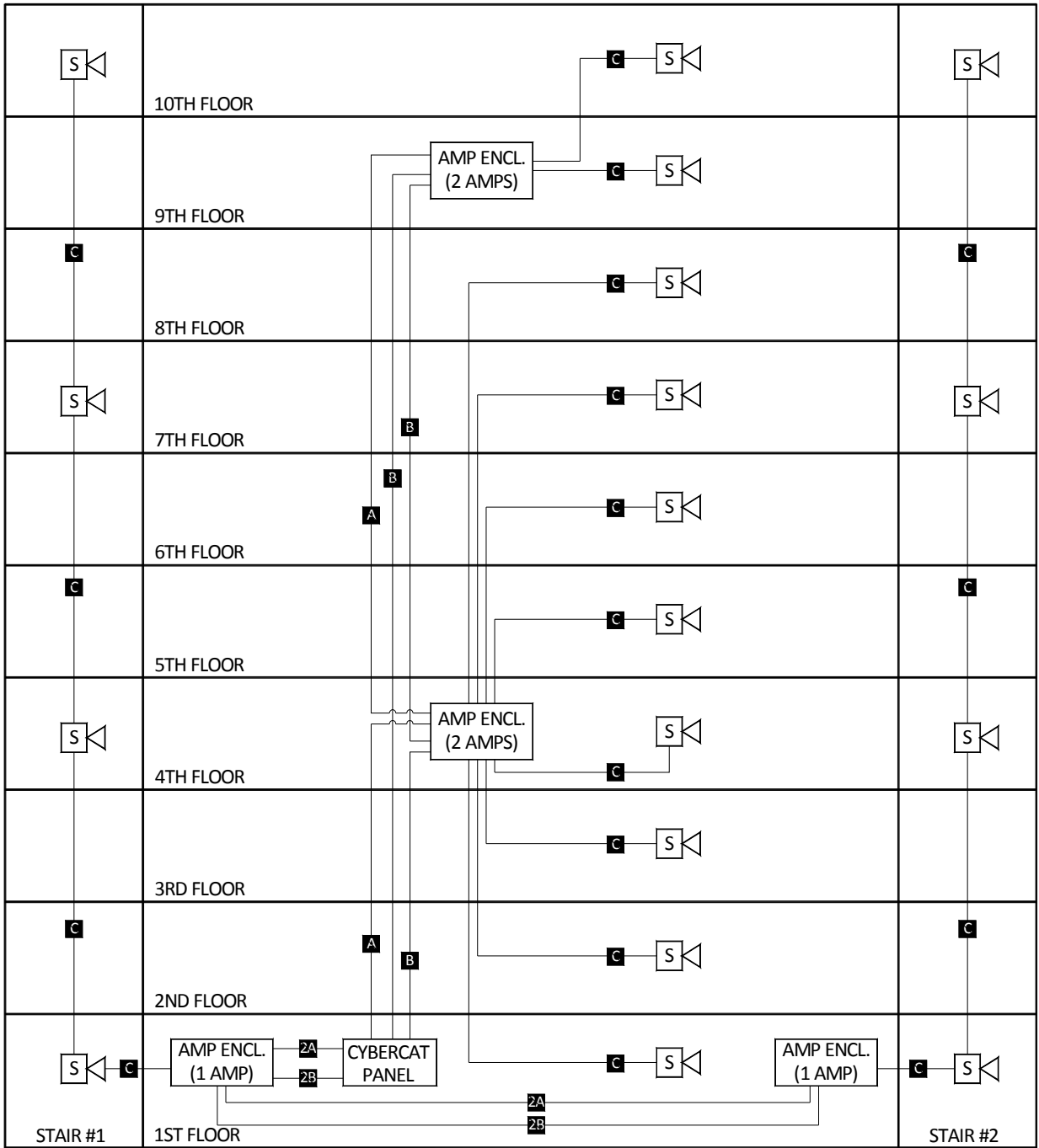
① Operational Note: On a single channel system, each amplifier serves a single paging zone. This allows Page to All, Page to Alert, Page to EVAC and Page to Zone functionality.

• DUAL CHANNEL SYSTEM

In a dual channel system, two amplifiers are tied together to form a single dual channel amplifier with eight (8) speaker outputs. Each of the eight (8) available speaker circuits can be configured to serve a different audio/paging zone (i.e. single floor, stairwell, elevator cabs, etc.). This configuration provides the following features and functions:

- A. One amplifier must be configured as the EVAC amp and the other as the Alert amp.
- B. Each amplifier pair (EVAC and Alert) will activate in tandem in response to an Alarm event in their assigned zone(s). The EVAC amp will play the evacuation message and the Alert amp will play the alert message. Each of the eight (8) speaker circuits will select either the EVAC or Alert amplifier as their audio source based on system programming.
- C. Each amplifier pair (EVAC and Alert) can be configured to play specific audio messages in response to the following system events: Drill, EVAC, and Test Alarm. Both amplifiers will operate in tandem in response to these events.
- D. Each amplifier pair can supply a total of 50 watts maximum to the eight (8) speaker circuits.
- E. Each speaker circuit can be configured to serve a different zone.
- F. If a speaker circuit is physically not going to be used, the circuit can be disabled.
- G. Page operation in a dual channel system varies depending upon the operational state of the voice system (i.e., normal operation or alarm active). Refer to “Dual Channel Paging Operation” for further details.

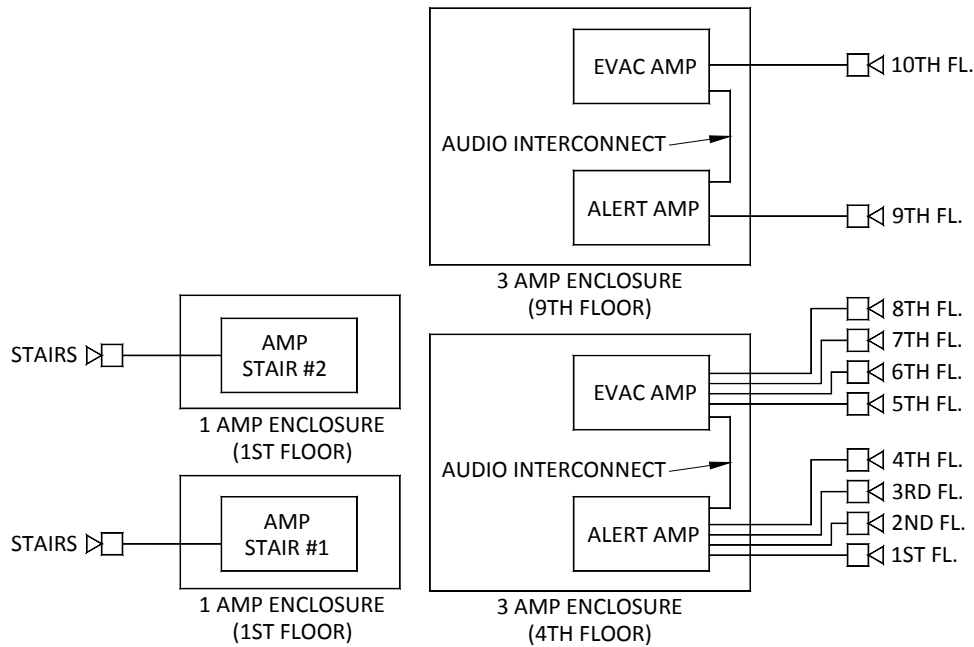
The example shown on the next page depicts a typical dual channel system layout, where two sets of interconnected amplifiers have been installed to serve all ten floors of the hotel. Two interconnected amplifiers have been installed on the 4th floor of the hotel and will serve the 1st through 8th floors. While a second set of interconnected amplifiers have been installed on the 9th floor of the hotel and will serve the 9th and 10th floors. Two additional amplifiers (single channel) are installed to service each stairwell.



- A** RS485 PERIPHERAL BUS
- B** AUDIO RISER
- C** SPEAKER CIRCUIT

EXAMPLE OF A TYPICAL DUAL CHANNEL SYSTEM

Fike offers several enclosure options for mounting the system amplifiers, ranging from a single amp enclosure to a five amp enclosure for larger applications. In this application example, two sets of interconnected amplifiers have been installed in two three amp enclosures located on the 4th floor and 9th floors of the hotel. Two, single amp enclosures with amp are installed to service the stairwells.



AMPLIFIER ENCLOSURE LAYOUTS

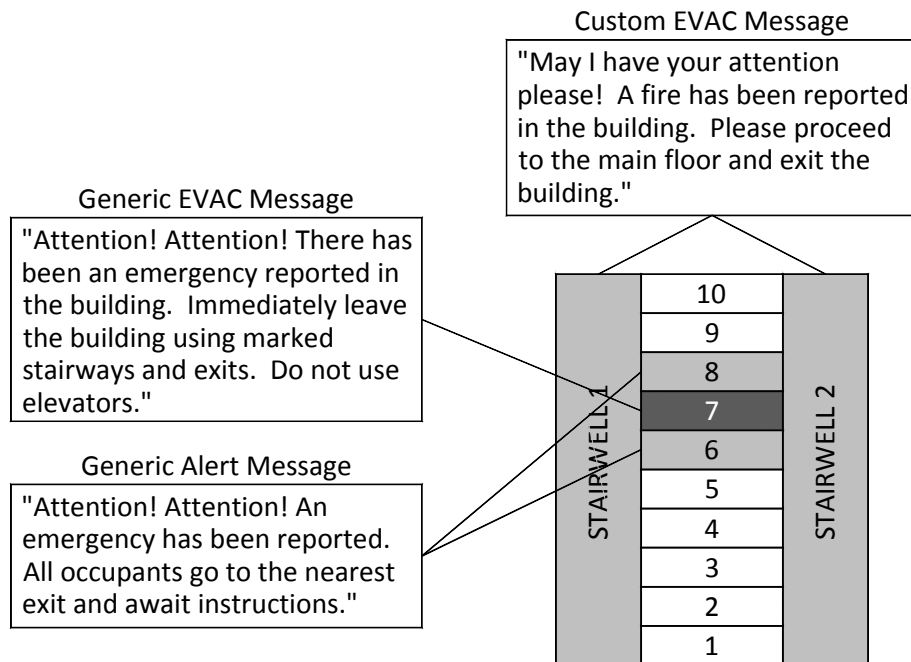
The following equipment list is very high level and does not reflect all components necessary to form a complete ECS system:

1. CyberCat™ control panel (254 or 1016), Qty. 1
2. Digital paging assembly, P/N 10-2751, Qty. 1
3. Single amplifier enclosure, P/N 10-2797, Qty. 2
4. Three amplifier enclosure, P/N 10-2754, Qty. 2
5. Amplifier kit, P/N 10-2773, Qty. 6

OPERATION

In response to an alarm event on the 7th floor, both sets of dual channel amplifiers located on the 4th and 9th floors will turn on and will begin to play their prerecorded EVAC and Alert messages. Based on zone mapping, the speaker circuits serving the 7th floor will select the EVAC amp as their audio source and will play the EVAC message, whereas the speaker circuits serving the 6th and 8th floors will select the Alert amp as their audio source and will play the Alert message. Speaker circuits serving non-affected areas will not turn on. See example below.

Should the fire condition spread, active speaker circuits currently playing the Alert message will automatically switch to play the EVAC message and speaker circuits serving zones not previously involved in the notification process will begin to play the Alert message in response to the spread of the fire.



EXAMPLE OF EVAC AND ALERT OPERATION ON A DUAL CHANNEL SYSTEM

① Salesmen/Designer Note: To determine the total number of amplifiers required for a dual channel system, you must first determine the total number of evacuation zones/areas (i.e., stairwells, elevator cabs, individual floors, etc.) that your system requires. If certain areas (i.e., stairwells, elevator cabs, etc.) require that a distinct evacuation or alert message is played in response to an Alarm event, you will need to provide a separate amplifier to play the distinct message in each zone/area. Next you will need to verify that the total wattage output of the speakers connected to any dual channel amplifier pair does not exceed 50 watts¹. If it does, additional amplifiers will be needed. Next, you will need to perform voltage drop calculations on each speaker circuit to determine if the voltage drop is too great. If it is, consider moving the amplifier(s) closer to the area served, increase the size of the wiring used on the speaker circuit(s), or install additional amplifier cards.

¹ Each set of dual channel amps is limited to a maximum of 50 watts output due to possibility that all eight speaker circuits could be required to play either the EVAC or Alert message on all eight circuits at the same time.

DUAL CHANNEL PAGING OPERATION

On a dual channel system, it is important to remember that each speaker circuit on an amplifier can be configured to serve a separate audio/paging zone.

Paging During Normal Operation – When the CyberCat™™ system is in Normal operation page commands are limited to Page All or Page to Zone and can be manually initiated by pressing a control switch programmed for the selected page operation. Upon switch press, the CyberCat™ panel will initiate a page command for the zone(s) assigned to the switch. Amplifiers and their associated speaker circuits that are assigned to the selected paging zone will activate and distribute the live page.

Paging During Alarm Operation – When an Alarm event is present on the CyberCat™ system, page commands are limited to Page All, Page to EVAC and Page to Alert and can be manually initiated by pressing a control switch programmed for the selected page operation. Upon switch press, the CyberCat™ panel will initiate a page command for the zone(s) assigned to the switch. Amplifiers and their associated speaker circuits that are assigned to the selected paging zone will activate and distribute the live page.

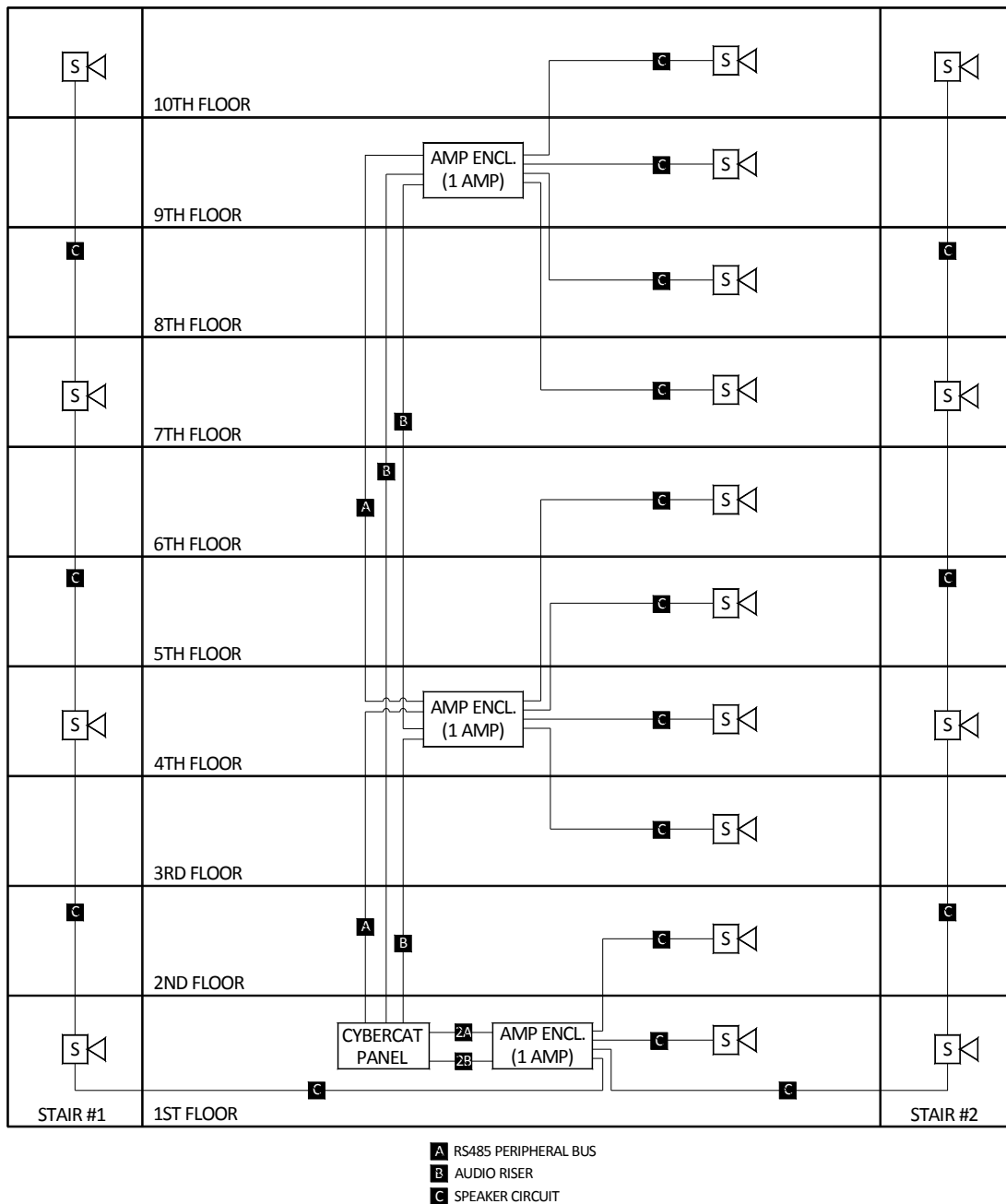
During Alarm operation, paging to individual zones is no longer possible due to the fact that in a dual channel system, interconnected amplifiers serve the same zones and both will activate in tandem in response to an alarm event with one playing the EVAC message and the other playing the Alert message. If a page to zone command is initiated, both amplifiers will switch to page operation causing both the EVAC and Alert messages to stop playing on all eight speaker circuits until the page operation to the selected zone is complete.

- **PAGE ONLY SYSTEM**

In a page only system, the amplifier(s) is utilized for paging purposes only. No automatic voice messaging is involved. This configuration provides the following features and function:

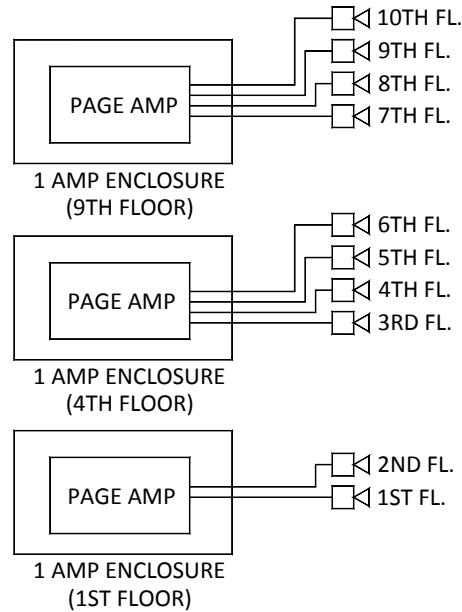
- A. Individual amplifier cards are distributed throughout the hotel with each amp being capable of serving up to four individual paging zones (i.e. single floor of a high rise building, stairwell, elevator cab, etc.).
- B. One or all four of the amplifier's speaker circuits can be utilized for paging purposes. If a speaker circuit is physically not going to be used, the circuit can be disabled.

The example below depicts a typical page only system layout.



EXAMPLE OF A TYPICAL PAGE ONLY SYSTEM

Fike offers several enclosure options for mounting the system amplifiers, ranging from a single amp enclosure to a five amp enclosure for larger applications. In this application example, three individual amplifiers have been installed in single amp enclosures located on the 1st, 4th and 9th floors of the hotel.



AMPLIFIER ENCLOSURE LAYOUTS

The following equipment list is very high level and does not reflect all components necessary to form a complete ECS system:

1. CyberCat™ control panel (254 or 1016), Qty. 1
2. Digital paging assembly, P/N 10-2751, Qty. 1
3. Single amplifier enclosure, P/N 10-2797, Qty. 3
4. Amplifier kit, P/N 10-2773, Qty. 3

PAGE ONLY OPERATION

In a page only system, page commands are limited to Page All and Page to Zone and must be manually initiated by pressing a control switch programmed for the selected page operation. Upon switch press, the CyberCat™ panel will initiate a page command for the zone(s) assigned to the switch. Amplifiers and their associated speaker circuits that are assigned to the selected paging zone will activate and distribute the live page.

ⓘ Salesmen/Designer Note: To determine the total number of amplifiers required for a page only system, you must first determine the total number of individual paging zones/areas (i.e., stairwells, elevator cabs, individual floors, etc.) that your system requires. Next you will need to verify that the total wattage output of the speakers connected to any single amplifier does not exceed 50 watts. If it does, additional amplifiers will be needed. Next, you will need to perform voltage drop calculations on each speaker circuit to determine if the voltage drop is too great. If it is, consider moving the amplifier(s) closer to the area served, increase the size of the wiring used on the speaker circuit(s), or install additional amplifier cards.