**SECTION 27 51 29**

**EMERGENCY COMMUNICATIONS SYSTEMS**

**PART 1 GENERAL**

**1.01 SUMMARY**

1. Equipment and materials used shall be standard components that are manufactured and available for purchase as standard replacement parts as long as the product is commercially available from the manufacturer.

**1.02 QUALITY ASSURANCE**

1. All command unit installation, configuration, setup, programming, and related work shall be performed by electronic technicians thoroughly trained by the manufacturer in the installation and service of the equipment provided.
2. All equipment shall be warrantied against any defects in material and workmanship under normal use for a period of sixty (60) months beginning on the earlier of (1) sale to an end customer, or (2) six (6) months after the equipment leaves the manufacturer’s facility.

**1.03 CERTIFICATIONS AND STANDARDS**

1. The command unit shall be designed to meet the following standards:
	1. NFPA 72: National Fire Alarm and Signaling Code (2016), §24.10
	2. International Building Code (IBC) (2021), §1009.8
	3. Accessibility
		1. ADA Accessibility Guidelines (ADAAG) (2010), Ch. 7
		2. ANSI ICC A117.1 (2017): Accessible and Usable Buildings and Facilities, Ch. 7
	4. Safety
		1. UL 60950-1

**PART 2 PRODUCTS**

**2.01 GENERAL**

1. The command unit shall:
	1. Be an indoor-rated emergency communications system device comprised of a local command unit phone, a monitoring panel, an external strobe/sounder, and an uninterruptible power supply (UPS) or an external DC power supply with backup battery.
	2. Be half duplex in operation.
	3. Be programmable through the local command unit phone.
	4. Be programmable from a remote location if a connection to the public switched telephone network (PSTN) is made available.
	5. Support and provide power to each analog call station for up to thirty-two (32) units as an area of refuge (or area of rescue assistance) station used for emergency communications.
	6. Provide analog call stations with the ability to establish communication with either an attendant at the local command unit phone or an attendant through a PSTN connection.
	7. Provide an audible and visual indication of a system ground fault.
	8. Provide an audible and visual indication of open faults and short faults that occur on an analog call station conductive pathway.
	9. Have a monitoring panel that provides a visual indication on the activation status and trouble status of the analog call stations.

**2.02 HARDWARE**

1. The command unit enclosure shall:
	1. Be constructed of 16 Ga. cold-rolled steel (CRS).
	2. Be powder coated red or black.
	3. Measure 14.5” W x 43.6” H x 6.0” D.
	4. Have mounting holes on the rear and sides of the enclosure.
	5. Have multiple 3/4" and 1” conduit knockouts for wiring access.
	6. Have a hinged door that shall:
		1. Provide a means for internal component servicing.
		2. Be held in place by 10-24 screws.
2. The local command unit phone compartment shall:
	1. Have a door with a magnetic latch.
	2. Have a door with an acrylic window so that the local command unit phone light-emitting diodes (LEDs) are visible.
3. The command unit shall:
	1. Weigh approximately 59 lbs.
	2. Group the thirty-two (32) analog call stations into banks of eight (8) for a total of four (4) banks.
4. The command unit shall have a monitoring panel to provide a visual indication on the activation status of analog call stations. The monitoring panel shall:
	1. Have one (1) LED for each analog call station to indicate activation status—for a total of thirty-two (32) LEDs.
	2. Group the analog call station LEDs into banks of eight (8)—for a total of four (4) banks.
	3. Have one (1) LED for each analog call station to indicate trouble status in the event an open fault or a short fault occurs on an analog call station conductive pathway—for a total of thirty-two (32) LEDs.
	4. Have one (1) LED for each bank to indicate the bank power status—for a total of four (4) LEDs.
	5. Have one (1) LED for each bank to indicate the status of a connection to the PSTN—for a total of four (4) LEDs.
	6. Have one (1) LED for each bank to indicate the status of a connection to the local command unit phone—for a total of four (4) LEDs.
	7. Have one (1) LED to indicate a fault when there is a loss in primary power provided to the UPS.
	8. Be protected by an acrylic window.
5. The local command unit phone shall:
	1. Have a handset with a coiled cord.
	2. Have a keypad with a standard 12-button layout.
	3. Support up to four (4) lines with each line assigned to access a dedicated bank of eight (8) analog call stations.
	4. Have lighted line indicators.
6. The external strobe/sounder shall:
	1. Be a combined unit that supports wall mounting.
	2. Have a strobe rating of 15 candelas.
	3. Have eight (8) audible signal options.
	4. Have an audio output ranging from 80 to 92 dBA at 10-feet (UL Reverberant); performance is dependent on selected audible signal.

**2.03 FUNCTIONALITY**

1. Local Command Unit Phone
	1. Receive calls from one (1) of the thirty-two (32) analog call stations.
	2. When an incoming call has been received, the local command unit phone shall audibly ring.
	3. When an incoming call has been received, the assigned line indicator button LED shall illuminate and flash.
	4. Originate calls selectively to one (1) of the thirty-two (32) analog call station.
2. Call Routing
	1. The command unit shall be configurable with one of the following call routing procedures:
		1. Only route calls to the local command unit phone;
		2. Only route calls through a PSTN connection;
		3. Route calls to the local command unit phone as primary, PSTN connection as secondary;
			1. First, route a call to the local command unit phone.
			2. Secondly, if there is no answer or there is a busy signal from the local command unit phone, then route a second call to the local command unit phone.
			3. Thirdly, if there is no answer or there is a busy signal from the local command unit phone, then route a third call through a PSTN connection.
			4. Fourthly, if there is no answer or there is a busy signal from the PSTN connection, then route a fourth call through a PSTN connection.
			5. Finally, if there is no answer or there is a busy signal from the PSTN connection, then continue routing the call in order and as described in the aforementioned cycle until the call is answered or the call conversation timer expires.
		4. Route calls to the PSTN connection as primary, local command unit phone as secondary.
			1. First, route a call through the PSTN connection.
			2. Secondly, if there is no answer or there is a busy signal from PSTN connection, then route a second call through a PSTN connection.
			3. Thirdly, if there is no answer or there is a busy signal from the PSTN connection, then route a third call to the local command unit phone.
			4. Fourthly, if there is no answer or there is a busy signal from the local command unit phone, then route a fourth call to the local command unit phone.
			5. Finally, if there is no answer or there is a busy signal from the local command unit phone, then continue routing the call in order and as described in the aforementioned cycle until the call is answered or the call conversation timer expires.
	2. Each bank of eight (8) analog call stations shall be capable of queueing calls on a “first in, first out” (FIFO) basis.
		1. When a call is in session, subsequent calls on the same bank shall be placed into a FIFO queue for a given analog call station’s respective bank.
		2. When a call is completed, the next call in queue on the same bank shall be automatically placed to either an attendant at the local command unit phone or an attendant through a PSTN connection.
		3. The FIFO queues for each bank shall be independent of other banks.
	3. When the attendant terminates a call, the analog call station shall automatically return to an on-hook condition.
3. Visual Indicators (Monitoring Panel)
4. Bank Power Status LEDs
	1. When a particular analog call station bank is powered, the respective bank LED shall be solidly illuminated.
	2. When there is a power fault for a particular analog call station bank, the respective bank LED shall be unlit.
5. Analog Call Station LEDs
	1. When an analog call station has been activated but not connected to either an attendant at the local command unit phone or an attendant through a PSTN connection, the respective analog call station LED shall be solidly illuminated.
	2. When an analog call station has been activated and the call has been answered by either an attendant at the local command unit phone or an attendant through a PSTN connection, the respective analog call station LED shall be solidly illuminated.
	3. Queued calls shall be indicated through the respective flashing analog call station LED.
6. Trouble LEDs
	1. When an open fault or short fault occurs on an analog call station conductive pathway, the respective trouble LED shall be solidly illuminated.
	2. When a system ground fault occurs, all trouble LEDs within the respective bank shall flash simultaneously.
7. PSTN LEDs
	1. When there is a call connection attempt through the PSTN port, the respective PSTN LED shall flash.
	2. When there is an active call connection through the PSTN port, the respective PSTN LED shall be solidly illuminated.
8. Local Command Unit Phone LEDs
	1. When there is a call connection attempt through the local command unit phone port, the respective local command unit phone LED shall flash.
	2. When there is an active call connection through the local command unit phone port, the respective local command unit phone LED shall be solidly illuminated.
9. Primary Power Status LED
	1. When there is a loss in primary power provided to the UPS, a dedicated LED shall be solidly illuminated.
10. Visual Indicator (Strobe)
	1. When an analog call station is activated, the strobe shall flash and continue for the entire duration of the call.
11. Audible Indicator (Sounder)
	1. When an analog call station is activated, the sounder shall emit its configured audible signal.
	2. When the call has been answered and a connection established with an attendant, the sounder shall deactivate.
12. Audible Indicator (Analog Call Station Prerecorded Voice Message)
13. An attendant at the local command unit phone or an attendant through a PSTN connection shall be capable of receiving a prerecorded voice message from the analog call station.
14. This prerecorded voice message shall notify the attendant of the analog call station location by playing at the beginning of the phone conversation.
15. Audible Indicator (Fault Siren)
16. When an open fault or short fault occurs on an analog call station conductive pathway, the fault siren shall emit an audible signal.
17. When a system ground fault occurs, the fault siren shall emit an audible signal.
18. Trouble Reset Switch
	1. The command unit shall have a trouble reset switch that can be used to:
		1. Deactivate the fault siren when any open faults, short faults, and system ground faults have been corrected.
		2. Deactivate trouble LEDs when any open faults, short faults, and system ground faults have been corrected.

**2.04 INTERFACES**

1. Analog Call Station Interface
	1. Each command unit shall be equipped with thirty-two (32) analog call station ports in order to support up to thirty-two (32) analog call stations.
	2. Each analog call station interface port shall provide power to one (1) analog call station through one (1) twisted, shielded pair with resistance not to exceed 25 ohms.
	3. The command unit shall be equipped with a terminal block for the analog call station interface.
2. Public Switched Telephone Network (PSTN) Interfaces
	1. The command unit shall be equipped with four (4) PSTN ports—one (1) PSTN port for each bank of eight (8) analog call stations.
	2. Each PSTN port shall interface through a terminal block.

**2.05 POWER REQUIREMENTS**

1. The command unit shall be powered by a built-in Uninterruptible Power Supply (UPS).
2. The command unit UPS shall:
	1. Be powered by a primary power source with the following AC rating:
		1. 120VAC, 50/60Hz, 240W
	2. Provide up to four (4) hours of standby time in the event of power source failure.
3. An external UPS option shall be available—providing up to twenty-four (24) hours of standby time followed by up to four (4) hours of full system operation.
4. The command unit shall support an external, centralized power supply.

**2.06 ENVIRONMENTAL**

1. The command unit shall:
	1. Operate in a temperature range of +32°F (0°C) to +120°F (+49°C).
	2. Operate in a humidity range up to 95% RH (non-condensing).

**2.07 MANUFACTURED UNITS**

1. The command unit shall be one of the following models:
	1. HON-AOR-32, 32-Station Area of Refuge Command Unit, black enclosure;
	2. Or HON-AOR-32-R, 32-Station Area of Refuge Command Unit, red enclosure.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

1. The installer shall carefully follow instructions in documentation provided by the manufacturer to ensure all steps have been taken to provide a reliable, easy-to-operate system.
2. All equipment shall be tested and configured in accordance with instructions provided by the manufacturer prior to installation.
3. The command unit shall support surface mounting.
4. The command unit shall be capable of supporting flush mounting through one of the following available trim ring models:
5. HON-AOR-TR32, flush mount trim ring for 24- or 32-Station Area of Refuge Command Units in black;
6. Or HON-AOR-TR32-R, flush mount trim ring for 24- or 32-Station Area of Refuge Command Units in red.

**END OF SECTION**