The Emergency Audio Evacuation, Communication and Paging System (EVAC) shall be an Applied American Technologies, Inc. EVAC 2101 System. It shall be UL modular-listed for use as a stand-alone or for use with a Fire Alarm Control Panel. **To allow for field additions and service, modules shall be listed as "Signaling Device Sub-Assembly."**

To ensure compatibility, all modules, digital message repeaters, and amplifiers used in the Emergency Audio Evacuation System must be by the same manufacturer. Substitution will not be permitted.

Features and Specification

1. The system shall have its own power supply with an integral Automatic High-Rate charger capable of charging up to 26 AH batteries. The Emergency Audio Evacuation System shall not derive power from the Fire Alarm Control Panel. The system shall also be capable of providing extra charging capacity for a larger battery standby.

2. Power Supply — The power supply shall have its own brown-out circuit with automatic switch-over to batteries during an alarm. Additional power supplies required to power the audio EVAC system amplifiers shall have their own Brown-Out and Earth (Ground) detection with diagnostic LEDs.

3. Brown-Out — During a brown-out condition, a separate brown-out indication shall be visible at the front of the control panel so that the operator will know that the cause of trouble is a brown-out condition and that service is neither possible nor necessary for this condition. At the same time there should be a system trouble indication to signal an abnormal condition.

4. Earth (Ground) Fault — The system shall have earth-ground fault detection with separate diagnostic LEDs to indicate the polarity of the ground fault. A system trouble indication shall be given in the event of an earth-ground fault.

5. Power Supply — All power supplies shall meet the revised UL 864 requirement, Appendix A, Paragraph 14 A. Power supplies shall also be provided with a fast-acting fuse in order to protect the solid-state circuitry.

6. Over-Voltage Protection — The power supply shall have fast-acting **over-voltage protection** to prevent any voltage above the operating voltage of the system components. The system should automatically transfer to the battery standby during over-voltage condition. **The over-voltage detection should automatically reset when the high voltage is removed and the voltage returns to normal**. This is to prevent a prolonged surge from permanently disconnecting primary power.

7. High Inrush Current — The power supply shall be capable of supplying **high inrush current to such devices as high-intensity strobes without tripping the electronic fuse.**

8. Amplifier — For increased efficiency, and to reduce standby power requirements and heat dissipation, the system shall use **digital audio power amplifiers. The amplifiers shall be UL-approved to comply with 1711 Amplifiers for Fire Protective Signaling Systems.**

9. Amplifier Power — The system shall have a minimum of 50 watts **RMS** audio power with the ability to expand in increments of 50 watts RMS.

10. Amplifier Supervision — The audio amplifier shall be **continuously supervised** and a trouble indication shall be given in case of failure.
11. Amplifier — The audio power amplifier shall meet the new UL 864 and UL 1711 requirements for power-limited circuits as specified in Appendix A, Paragraph 44A. The audio amplifier shall be electronically-fused with a separate diagnostic indication in case of trouble. Each audio power amplifier shall have its own pre-amplifier.

12. Amplifier Inputs — The audio amplifier shall have separate inputs for:

    a) Microphone.
    b) Telephone.
    c) Pre-recorded Message.

13. Microphone — The microphone connections shall be supervised.

14. Tone Generator — The system shall have a supervised tone generator with a standby tone generator in case of malfunction.

15. Audible Alarm Notification — Audible alarm notification shall be by voice evacuation and tone signals on speakers in areas indicated on drawings.

    Automatic Voice Evacuation Sequence

    The system shall have an Applied American Technologies, Inc. Digital Message Repeater unit to provide a SUPERVISED pre-recorded message and the following sequence in the event of an alarm:

    a) Alert Tone (pre-announce tone) — 5 seconds

    b) Alarm Message — There should be a minimum of 50 seconds available for the message with expansion to at least 150 seconds to allow for messages in more than one language.

    c) Whoop or Coded Tone

    The sequence of Alarm Message followed by Alarm Tone shall be repeated until the system is reset.

    The pre-recorded message shall be automatically silenced when the microphone is keyed.

16. Manual Voice Paging

    a) The system shall have a manual zone-select switch for each zone. Operation of the zone-select switch shall allow voice paging to all speakers in that zone.

    b) A LED indication of the zone or zones activated shall be visible at the front of the control panel.

    c) The control panel operator shall he able to make announcements via the push-to-talk paging microphone over the speakers of the selected zone or zones.

    d) Facility for total building paging shall be accomplished by means of an All-Call switch.

    e) The activation of one audio zone shall also be capable of being programmed to cause the activation of each of the two contiguous audio zones (floor-above / floor-below). The system shall also allow easy configuration for activation of any combination of audio zones when one audio zone is activated.

17. Power Requirements

a) The control shall receive 120 VAC via a dedicated fused disconnect circuit.

b) The system shall be provided with sufficient battery capacity to operate the entire system, upon loss of normal 120 VAC, in a normal manner for a period of 24 hours, after which the system should be capable of sounding the alarm for a minimum of 15 minutes.

18. The system shall be modular to enable easy servicing.

19. Speaker Supervisory Circuit — Speaker supervisory circuits shall be Style ñZî (Class A) with diagnostic LEDs to indicate open, overload, and short-circuit conditions.

20. Speaker Supervisory Circuit — An overload on a speaker circuit during standby, alarm tone, or paging shall shut down only that speaker circuit without effecting any other circuit connected to the system.

The speaker supervisory outputs shall meet the new Power-Limited requirement of UL 864, Appendix A, Section 24A during standby, alarm, and **also during transmission of voice messages. The system shall comply with the requirements of NFPA 72, Section 3-2.4. Loss of communication shall be taken to mean any loss of tone or voice caused by an open, ground, or short circuit.**
Even when connected to the same amplifier, each speaker supervisory card or module shall independently disconnect its output in the case of an overload or short circuit. The other circuits shall continue to operate normally. In the event of a short circuit or overload, the short-circuit disconnect should occur both during Standby and during an alarm.

The short-circuit and overload disconnect should also be activated if an audio output overload occurs while speech is being transmitted over the speakers. This requirement is essential to maintain the survivability of the Emergency Audio Evacuation System. This feature must be demonstrated to function during acceptance tests for the installation.

21. Speakers — Any approved 25-volt or 70-volt speaker may be used with the system. In order to ensure multi-source availability, special purpose addressable speakers shall not be used.

22. Speaker / Visible Units — Combination speaker / visible (S / V) units shall be UL-Listed to UL 1971 and UL 1480.

23. Digital Message Repeater — **The MessageMaker shall be capable of transmitting a pre-recorded test message when the MessageMaker (digital message repeater) is in test mode. This is to prevent confusion to occupants.**

24. The MessageMaker shall have non-volatile memory and not rely on battery power to retain recordings.

25. Remote Paging Microphone — The system shall have the capability for the supervised connection of a remote paging microphone.

26. Initiating Inputs — The system shall have the capability of supervising the initiating inputs from a Fire Alarm or other control. A separate **trouble** indication shall be given at the Audio EVAC System for each initiating input in case of an open circuit.

27. Annunciator — The control shall have an **integral** annunciator to provide separate visible annunciation for each **alarm** initiating input and each audio output. This feature provides

annunciation **at one central audio control location** for both the active initiating and the active indicating circuits.

28. Switchcard — Each switchcard shall have an **integral** diode matrix for providing selection and cross-zoning of audio outputs (such as floor-above / floor below selection).

29. Switchcard — To meet NFPA 72, Section 3.12.4.3.4, the switchcard for the audio output control shall have a three-position switch for **every** audio zone. Detailed switch function / operation instructions shall be provided on the control door of the cabinet. In order to avoid confusion, and to provide both a mechanical (switch position) and visual (LED) indication of zone activation, **a keypad for controller selection shall not be acceptable**.

    Switch Positions

    In the normal (CENTER) position the system shall AUTOMATICALLY activate the audio output circuits selected via the diode matrix.
    The UP position shall allow for MANUAL SELECTION of audio output zones.
    The DOWN position shall allow for any zone to be MANUALLY DISABLED.
    A LED indication of the switch position shall be given on the switchcard.
    All off-normal switch positions shall result in a system trouble.

30. Tone-Silence Switch — A tone-silence switch shall be provided such that the operator has the option of silencing the alarm tone when the microphone is not keyed. A system trouble shall be given when this switch is operated.

31. Audio Level — A LED indication shall be provided to indicate the audio level and the presence of audio from the system.

32. Speaker Supervisory Module — The system shall be provided with separately supervised, plug-in speaker supervisory modules. These modules shall provide both open and overload / short-circuit supervision and diagnostic LEDs shall be provided for each of these conditions for each circuit.

33. Speaker Supervisory Circuit Branching — The system shall be capable of providing more than one supervised speaker output per audio zone to enable supervised branching of speaker circuits.

34. Strobe Supervisory Circuit — The system shall provide supervised outputs for strobes. The strobes shall be activated by an input from any initiating zone and shall remain on until the system is reset.

35. Power Source — The system shall be totally self-contained with its own charger and standby battery. **Any system that requires power from the fire alarm system to power the audio amplifiers and emergency evacuation control shall not be acceptable**.

36. The system shall have its own supervisory circuits for speakers and strobes. The use of horn, bell, or strobe supervisory circuits of the fire alarm for this purpose shall not be acceptable.

Emergency (Firefighter's) Telephone System

37. The Emergency Firefighter's Telephone System shall be an Applied American Technologies, Inc. Emergency Telephone 2101-EP System. Each line shall be capable of handling six (6) telephones simultaneously on line. The system shall be capable of expansion from a single line to multiple lines.

38. Where more than one telephone circuit is used, an intermittent tone and flashing LED shall indicate an unanswered call on the line. Activation of the ZONE ACKNOWLEDGE switch shall result in a steady LED and tone silence.

39. The system shall provide a switch for connecting any emergency telephone into one or more zones of the paging system. This is to allow emergency communications to be made from any telephone over the speaker circuits.
40. The telephone lines shall be supervised and a trouble indication per zone shall be provided.

Relay Controls

41. The system shall provide supervised inputs for automatic activation of outputs. Trouble indication by zone shall be visible at the control switchcard. A trouble output shall be provided.

42. The system shall provide switchcards which indicate by means of a LED which initiating input is active.

43. The system shall provide supervised outputs to activate remote relays which may control fans, vents, dampers, etc.

44. The system shall have a diode matrix integral to the switchcard which can be programmed to activate combinations of remote relays.

45. The system shall provide an indication of which output relays have been activated.

46. The system shall allow manual activation / disabling of the relay output by zone.