

MODEL SPECIFICATION FOR MASS NOTIFICATION EMERGENCY COMMUNICATION SYSTEM

The MASS EVACUATION Emergency Communication System shall be an Applied American Technologies, Inc., EVAC 2101 MASS-EVAC System.

To ensure compatibility, all modules, digital message repeaters, and amplifiers used in the System must be by the same manufacturer or approved by Applied American Technologies, Inc. Substitution shall not be permitted.

The MASS EVACUATION SYSTEM shall be compliant with UFC 4-021-01, Design and O & M Mass Notification Systems and meet or exceed the DOD Minimum Standards for Buildings.

The MASS EVACUATION SYSTEM shall be capable of working autonomously or in conjunction with other systems approved by Applied American Technologies, Inc.

The MASS EVACUATION SYSTEM shall be capable of functioning as the Master Control for Distributed Autonomous MASS EVAC Units.

Features and Specification

1. Power Supply

- a) The system shall be totally self-contained with its own power supplies, charger, and standby batteries.
- b) Systems that derive power from the fire-alarm or other system or controls shall not be acceptable.
- c) Power supplies shall also be provided with a fast-acting fuse in order to protect solid-state circuits.
- d) The system shall have a 120 V AC primary power supply via a dedicated fused disconnect circuit.

2. Charger

The system shall have its own power supply with an integral Automatic High-Rate charger capable of charging up to 26 AH batteries. The system shall also be capable of providing extra charging capacity for longer battery standby.

Space shall be provided within the control for standby batteries.

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 shall 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. Additional Power Supplies

Additional Power Supplies required to power the audio amplifiers and other circuits shall have their own Brown-Out and Earth (Ground) detection with diagnostic LEDs.

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 shall automatically transfer to the battery standby during an over-voltage condition.

A trouble indication shall be provided when an over-voltage condition occurs.

To prevent a prolonged surge from permanently disconnecting primary power to the system, the over-voltage detection should automatically reset when the high voltage is removed and the voltage returns to normal.

7. Inrush Current Protection

The power supply shall be capable of supplying a high inrush current to such devices as high-intensity Strobes without tripping a fuse or disabling the circuit.

8. Amplifier

The audio power amplifier shall meet 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.

For increased efficiency, and to reduce standby power requirements and heat dissipation, the system shall use **digital audio power amplifiers**.

9. Amplifier (Audio) Power

The system shall have a minimum of 50 watts RMS audio power with the ability to expand to any level of audio power.

10. Amplifier Supervision

The audio amplifier shall be **continuously supervised** and a trouble indication shall be given in case of failure.

Audio from the Power Amplifier shall also be supervised ensure that the output of the amplifier is available for the speakers.

11. Back-Up Amplifier

The system must be configured to permit the option of one or more back-up amplifiers.

If one back-up amplifier is used for a number of primary amplifiers, then the back-up amplifier shall automatically replace the first amplifier that is disabled.

The system shall be capable of having more than one back-up amplifier for one or a group of amplifiers.

12. System Audio Inputs

The audio amplifier shall have separate inputs for:

- a) Microphone.

- b) Auxiliary Audio Input
- c) Pre-recorded Messages.

13. Microphone

The microphone connections shall be supervised.

14. General Supervision

All harnesses and modules shall be supervised such that removal of a harness or module shall result in a trouble indication.

15. Message/Tone Generators (Digital Message Recorders)

- a) The system shall contain one or more MessageMakers.
- b) Each Message shall be recorded on a separate module to enable quick replacement of a message without affecting other messages.
- c) The MessageMaker should be capable of recording a minimum of 45 seconds per message.
- d) A jack or microphone shall be provided to permit recording of messages into the MessageMaker.**
- e) Messages shall be capable of being selected separately.
- f) Messages shall be capable of being prioritized.
- g) Each T-GEN MessageMaker units shall be separately supervised continuously for the entire length of the message. Partial or intermittent sampling of message content shall not be permitted.
- h) Failure of any message shall provide a separate trouble annunciation for that message unit.
- i) An output shall be provided for a Message trouble.
- j) For easier field-service and reliability, the MessageMakers shall be capable of replacement without removing wiring to terminals.
- k) The System shall be capable of having an OPTIONAL individual back-up T-GEN Message-Maker for each primary T-GEN MessageMaker. The optional back-up MessageMaker shall automatically replace the MessageMaker in trouble.
- l) Recordings shall be made in non-volatile memory. Power Supply interruption or failure shall not result in loss of recorded messages. The message units shall not rely on batteries or other power storage means to retain the message.
- m) An audio output jack shall be provided from each MessageMaker to check for the presence of each message separately without activating switches or controls. This is to prevent inadvertent transmission of a message.
- n) To ensure uniformity of audio levels, each MessageMaker shall have a separate audio level control to adjust the audio output.

16. Sequence of Operation – Audio Zone & Message Selection

The following sequence shall be used to transmit a selected message:

- a) The Audio Zone Selection Switch on the Audio Zone Selection Switch Card shall be used to select the audio zone that is to receive the message.
- b) The Audio Zone Select Switch must be moved UP from the Center position to select the AUDIO ZONE.

- c) One or more audio zones shall be capable of being selected.
- d) Moving the ALL CALL switch shall result in the selection of ALL the audio zones.
- e) The Message Select switch must then be moved UP from the Center position to select the MESSAGE to be transmitted. This shall result in the message being transmitted to the selected zones.

17. Audio Zone Selection Switch Card

The Mass Evacuation Communication System shall be capable of transmitting the selected message to one or more zones simultaneously.

Audio Zone Switch Cards shall be provided with the following features:

- a) A three-position switch for manually selecting/deselecting each audio zone.
- b) The normal (Center) position of the switch shall permit the associated audio zone to be selected from an external switch or control.
- c) Moving the switch UP shall manually select the associated audio zone.
- d) A LED indication shall be provided to indicate that the switch is in the ON position and that one or more audio zone circuits have been selected.
- e) Moving the switch DOWN shall manually de-select the associated audio zone(s).
- f) A LED indication shall be provided to indicate that the switch is in the OFF position.

18. Sequence of Operation - Message De-Selection

The following sequence must be used to switch terminate message transmission when audio circuit selection has been made by operation of a Audio Zone Select Switch,

- a) The Audio Zone Select Switch must be moved to the CENTER position to switch off transmission to the AUDIO ZONE.
- b) The Message Select switch must then be moved CENTER position to disconnect the message input from the amplifier.

19. Visual Notification Devices

The system shall be configured to provide supervised outputs for visual notification devices.

- a) Operation of a paging zone shall automatically activate one or more associated notification zones.
- b) Notification zones shall be capable of being switched off separately without affecting paging or the transmission of a pre-recorded message.

20. Manual Selection of Zones for Voice Paging

- a) The system shall have Audio Zone Switch Cards for the manual selection of each zone. Operation of the zone-select switch shall allow voice paging to all speakers in that zone or group of zones.
- b) A LED indication of the audio zone or zones activated shall be visible at the front of the control panel.
- c) The control panel operator shall be able to page via the push-to-talk paging microphone over the speakers of the selected zone or zones.
- d) An All-Call switch shall be provided to permit paging to all audio zones simultaneously.
- e) The activation of one audio zone shall also be capable of being programmed to cause activation of each of the two or more audio zones (example: floor-above / floor-below).
- f) The system shall also allow easy configuration for activation of any combination of audio zones

when one audio zone is activated.

21. Speaker Supervisory Circuit

- a) Speaker supervisory circuits shall be Style "Z" (Class A) with diagnostic LEDs to indicate open, overload, and short-circuit condition.
- b) An overload on a speaker circuit during standby, alarm tone, or paging shall shut down only that speaker circuit without affecting any other circuit connected to the system.
- c) 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 fault, or short circuit.**
- d) When a number of circuits are connected to the same amplifier, each speaker supervisory card or module shall independently disconnect its output in the event of an overload or short circuit. All other circuits shall continue to operate normally.
- e) Where multiple circuits are connected to a zone, each circuit shall be independently supervised and shall meet the requirements of item # 22-d above.
- f) In the event of a short circuit or overload, the short-circuit disconnect should occur both during the normal (quiescent) operating state and during an alarm.
- g) **The short-circuit and overload disconnect should also be activated if an audio output overload occurs while only the message or paging is being transmitted over the speakers. This requirement is essential to maintain the survivability of the MASS Emergency Evacuation System under all transmission conditions. This feature must be demonstrated to function during the acceptance tests for the installation.**

22. Speakers

Any approved 25-volt or 70-volt speaker may be used with the system. Speakers shall be capacitor coupled and a tapped transformer provided in order to select the audio output level suitable for the speaker location.

23. Remote Paging Microphone

- a) The system shall have the capability for the addition of one or more supervised remote paging microphones.
- b) The Remote Paging Microphone shall be in a locked cabinet.
- c) To improve the signal-to-noise ratio, the Remote Paging Microphone shall have an amplifier with an adjustable output capable of transmitting a signal of at least 12 volts rms.
- d) The Main Mass Evacuation Communication Control shall take priority over any remote paging microphone.
- e) The output of a speaker circuit shall be supervised for audio to ensure that the paging signal is being transmitted to the speakers.

24. Initiating Inputs

When a Mass Evacuation System is used as an accessory to a Fire Alarm Control, the initiating circuit between the Mass Evacuation System and the Fire Alarm Control shall be supervised for an open

circuit fault. A separate trouble indication per initiating input shall be displayed on the Mass Evacuation System Control.

25. Annunciator

The control shall have an **integral** annunciator to provide separate visual indication for each alarm initiating input and each audio output. This shall provide visual annunciation **at one central control location** for both the activating initiating and the activated indicating circuits.

26. Switch Card

Each switch card shall have a means for providing selection and cross-zoning of audio outputs (such as floor-above/floor below selection).

- a) To meet NFPA 72, Section 3.12.4.3.4, the switch card for the audio output control shall have a three-position switch for **every** audio zone.
- b) The position of a switch shall not be accepted to indicate the status of the operation. A separate visual indication must be provided for the ON and OFF function of each switch.
- c) Detailed switch function/operation instructions shall be provided on the control of the cabinet.
- d) **Keypad controls for selection shall not be acceptable.**

27. Switch Positions

In the normal (CENTER) position an initiating input from an external control or switch shall **AUTOMATICALLY** activate the selected audio output. A visual indication shall be provided to indicate that the audio zone has been activated.

Moving the switch to the UP position shall **MANUALLY SELECT** the audio output zone. A visual indication shall be provided to indicate that the switch has been operated and a separate visual indication shall be provided to indicate the audio zone (or zones) has been activated.

The DOWN position shall allow for any zone to be **MANUALLY DISABLED**. A visual indication shall be provided to indicate that the switch is in the OFF position.

All off-normal switch positions shall result in a system trouble.

28. Tone-Silence Switch

A tone-silence switch shall be provided such that the operator has the option of silencing any alarm tone or message when the microphone is not keyed. A system trouble shall be given when this switch is operated.

29. Audio Indication

A LED indication shall be provided to indicate the presence of audio from the system.

30. 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.

31. Strobe Supervisory Circuit

The system shall provide supervised outputs for strobes. The Strobe Circuits shall be capable of being activated by the following means:

- a) By an input from any initiating zone and shall remain on until the system is reset.
- b) Operation of a switch on a Switch Card.
- c) Operation of a switch activating a Speaker Circuit.

32. Wireless Paging

The system shall be configured to accept accessory modules for paging from a remote location by means of wireless transmission. When such a means is used, the accessory module shall have a dedicated address.

33. Main MASS EVAC Control

The system shall be configured so that pre-recorded message shall be individually selectable from the Main Control or from an external source such as a Remote Switch Panel or Fire Alarm Control.

The MASS EVAC Central Control shall be self-contained with the minimum of the following features:

- Power supply
- Battery charger
- Microphone
- Amplifier,
- Multiple message (“DMR”) units
- Messages should be arranged so that they could be prioritized
- Message selection switches
- Visual indication of the message selected
- Visual indication of the Audio Zone Selected
- Visual indication of any Audio Zone De-Selected
- Inputs for selecting messages from an external source
- Continuous supervision of all messages
- Speaker Supervisory Circuits
- Strobe Supervisory Circuits
- All Call Audio Enable Switch
- Option for connection to a Telephone Accessory Module
- Option for activation by wireless transmission
- Option for Standby Power Supply
- Option for Standby Audio Amplifier
- Distributed MASS EVAC sub-panel controls shall be selectable individually or in groups or simultaneously from the Main MASS EVAC Control.

34. Distributed MASS EVAC System

The Distributed (Autonomous) MASS EVAC System shall be modular in construction to reduce down time.

Modules shall be easily replaceable in the field.

Each Distributed MASS EVAC System shall be self-contained with the minimum of the following features:

- Power supply
- Battery charger
- Microphone
- Amplifier,

- Multiple message (“DMR”) units
- Messages should be arranged so that they could be prioritized
- Message selection switches
- Inputs for selecting messages from an external source
- Continuous supervision of all messages
- Speaker Supervisory Circuits
- Strobe Supervisory Circuits
- All Call Audio Enable Switch
- Option for connection to a Telephone Accessory Module
- Option for activation by wireless transmission
- Option for Standby Power Supply
- Option for Standby Audio Amplifier
- Distributed MASS EVAC sub-panel controls shall be selectable individually or in groups or simultaneously from the Main MASS EVAC Control.
- A trouble condition in any MASS EVAC Distributed Control shall be transmitted to the Main MASS EVAC Control.

**** OPTION: This is for systems that have to be installed in non-English speaking countries where messages in a different language/dialect are required. This feature will enable standard systems to be deployed with a minimum of delay.**