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Operations and Systems
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NOAA WEATHER RADIO ALL HAZARDS (NWR) SPECIFIC AREA MESSAGE ENCODING (SAME)

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SUMMARY OF REVISIONS: This directive supersedes NWSI 10-1712, *NOAA Weather Radio All Hazards (NWR) Specific Area Message Encoding (SAME)*, dated October 3, 2011. Changes were made to:

- Correct the title to reflect correct reference to NOAA Weather Radio All Hazards
- Correct title for NWS Directive 10-1805, *National and Regional Public Information Statements and Service Change Notices*
- Update NWS Director of the Office of Dissemination to M. Mainelli-McInerney.
- Revise the standard wording for S.A.M.E. to SAME
- Add BMH hardware and software support provided by the Office of Central Processing to Section 3, to *Organizational Responsibilities*
- Change grammar, sentence structure, and minor formatting
- Change Consumer Electronic Association to Consumer Technology Association
- Move reference to CTA Public Alert Receiver specification to a footnote
- Insert a footnote concerning the Emergency Alert System (EAS)
- Address products: Blue Alert (BLU), Snow Squall Warning (SQW), Storm Surge Watch (SSA), Storm Surge Warning (SSW), and Extreme Wind Warning (EWW.
- Update webpage links
- Note in Appendix A, Section A.2.8.1 that the NWS prefers to refer to county subdivisions as county partitions; clarified those partitions for partial county alerting
- Add to Appendix A, Section A.3.7, the description and prerequisites for using a real location code with the DMO event code to demonstrate over the air real-time broadcast of emergency messages
- Re-write Section 2 for clarity and accuracy

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NOAA Weather Radio All Hazards (NWR) Specific Area Message Encoding (SAME)

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1. Purpose

This instruction describes the format and use of National Oceanic and Atmospheric Administration (NOAA) Weather Radio All Hazards (NWR) Specific Area Message Encoding (SAME) in support of the National Weather Service (NWS) mission "to protect life and property and to enhance the national economy." This mission is accomplished through effective dissemination of emergency alerts and weather information to the public. This instruction also covers NWS organizational responsibilities for SAME.

2. SAME Description

SAME provides, in a digital data format, specific information on the nature and location of a threat to the safety of those most immediately at risk from all hazards (i.e., weather, hydrologic, and non-weather hazards).

2.1. Benefits of SAME

SAME facilitates accurate and timely distribution of alerts to NWR broadcast users (i.e., NWR listeners and Emergency Alert System (EAS)[1] participants / broadcasters) for all hazards threatening life and/or property. SAME allows NWR listeners to receive automated notifications of all hazard alerts for the geographical areas and hazard types most relevant to them. SAME-

[1] FCC §11.31 EAS protocol. - https://www.ecfr.gov.

capable NWR receivers can be programmed to automatically activate when alerts are received for the locations and hazard event types programmed into the receiver by the user. The use of SAME allows listeners to reduce the number of unwanted notifications by identifying a smaller geographically-defined area within the typical 40-mile radius broadcast area and by selecting only those message types of concern to the listener. Similarly, television and radio broadcasters monitor NWR using program-compatible equipment for local activation of the nation's EAS.

NWS recommends the use of NWR receivers with the Public Alert and/or the NOAA Weather Radio All Hazards logo. These receivers have an additional application of SAME or a 1050 hertz (Hz) Warning Alarm Tone that includes an automatic audio and/or visual alerting feature to conserve power while in a "stand-by" mode. This application is a measured criteria in Consumer Technology Association (CTA) "Public Alert" certified NWR receivers.[2]

2.2. SAME History

In 1985, NOAA's NWS began experimenting with special digital codes at the beginning and end of messages concerning life-threatening or property-damaging events. The intent was to transmit these digital codes with the broadcast of all NWR messages. This system evolved with great success into what is known today as SAME. Previously, NWS used a similar digital approach that later evolved with great success into what is known as the Universal Geographic Code (UGC) in its dissemination services. UGC is a geographical and "product expiration" code used in most event-driven and regularly scheduled NWS text products regardless of text dissemination method. SAME is currently an audio-only dissemination protocol used on event-driven products directly related to NWS mission of protection of life and property. NWS adopted SAME for national implementation in 1988, using a shared funding partnership arrangement with users in the local service areas of NWR stations. In 1994, the Federal Communications Commission (FCC) adopted SAME as the digital encoding protocol for the nation's new EAS, which was implemented on January 1, 1996. In 2003, the CTA established a commercial standard for "Public Alert" receivers with specific criteria concerning the SAME feature.

3. Organizational Responsibilities

This section describes the responsibilities of the NWS Headquarters, regional headquarters, and field offices for SAME incorporation and validation. Additional information on NWR system management responsibilities can be found in NWS Instruction (NWSI) 10-17, *Dissemination Policy*, NWSI 10-1710, *NOAA Weather Radio All Hazards (NWR) Dissemination*, NWSI 10-1711, *NOAA Weather Radio All Hazards (NWR) System Management*, and NWSI 30-2113, *AWIPS Maintenance*.

3.1. NWS Headquarters (WSH)

The Assistant Administrator (AA) for Weather Services has the overall responsibility for the WSH NWR program, of which SAME is a subset. Management of the SAME protocol is divided between the Office of Dissemination (DIS) and the Analyze, Forecast and Support Office (AFSO).

[2] CTA Standard 2009-B R-2016 "Performance Specification for Public Alert Receivers," https://webstore.ansi.org/standards/ansi/cta20092010r2016ansi. CTA evolved from the Consumer Electronics Association (CEA).

3.1.1 Office of Dissemination (DIS)

DIS provides assistance to the AA for the SAME technical specification protocol, overall program management, and configuration control. The Dissemination Systems Branch (DSB) within DIS is responsible for the NWR network, systems, and equipment.

3.1.2 Analyze, Forecast and Support Office (AFSO)

AFSO provides the service requirements and instructions for the message code content and usage of SAME (see NWS Instruction 10-1710, *NOAA Weather Radio All Hazards (NWR) Dissemination*). "Usage" as detailed herein covers event codes, Federal Information Processing Series (FIPS) geographical codes, originator information, and other alert information that may be included in the SAME protocol. AFSO is responsible for NWS coordination with the FCC regarding EAS to maintain service compatibility between NWR and EAS.

3.1.3 Office of Central Processing (CP)

CP supports the hardware and software for the Broadcast Message Handler (BMH) operations in each WFO that originates the SAME data and voice message and controls the broadcast signal from the WFO to each of the transmitters.

3.2. Regional Headquarters (RH)

Each RH manages the message code content and usage of SAME within its respective region. The RH also coordinates, defines, and documents in regional supplements, as necessary, the broadcast service areas where SAME use is authorized for each NWR station in the region (see NWSI 10-1710, section 4.1) and any specific changes or variations to this directive.

3.3. Field Offices

NWS field office management implements instructions and guidelines in national instructions and regional supplements consistent with local service requirements. Field offices also coordinate with local emergency managers concerning Non-Weather Emergency Messages (NWEM).

4. SAME Coverage Area

SAME coverage areas are defined within the NWR "Broadcast Service Area" (see NWSI 10-1710, section 4.1). SAME location codes address areas within the NWR "Broadcast Service Area" and are comprised of Bureau of the Census-defined county equivalents (e.g., counties, boroughs, independent cities, parishes) or portions thereof, as well as bounded and named marine areas. NWR "Broadcast Service Area" maps are at https://www.weather.gov/nwr/Maps.

5. SAME Location Code Update

Location codes and the associated radio frequencies for use in SAME receivers can be found at https://www.weather.gov/nwr/counties/. SAME location codes are updated and announced in Service Change Notice messages (https://www.weather.gov/notification/) which provide appropriate advanced notice before implementation (see NWSI 10-1805, *National and Regional*

Public Information Statements and Service Change Notices).

Listeners programming SAME receivers with county(s) and/or marine area(s) of their choice can obtain the online information at the above referenced website for counties or by telephone at 1-888-NWR-SAME (1-888-697-7263). New or existing SAME location codes not already pre-programmed into the NWR receiver (and applicable to the listener's needs) should be manually programmed into the NWR receiver according to the manufacturer's instructions.

6. SAME Technical Specifications

Specifications for SAME message format are detailed in Appendix A, SAME Message Format. For information on SAME code interpretation by receivers, see Appendix B, SAME Receiver Performance Recommendations and Considerations.

APPENDIX A - SAME Message Format

A.1. SAME Message Format/Elements. The number of event type messages and geographical area codes that SAME can identify is nearly unlimited. However, there is a limit of 80 message types disseminated FCC rules. There is a self-imposed practical limit on both the NWR and EAS to avoid defining the types of messages too narrowly. Such a narrow definition of message types could easily become an unmanageable list that would exceed most consumer equipment resources, as well as the public's ability to program their receivers. EAS rules also limit the number of unique geographical areas that can be included in any one message to thirty-one (31).

A SAME transmitted data message consists of six (6) possible elements in the following sequence:

1) Preamble
2) Header code
3) Warning Alarm Tone/Attention Signal
4) Voice Message
5) Preamble
6) End Of Message (EOM)

Elements 1, 2, 5, and 6 will always be transmitted in a SAME message and repeated three (3) times. Elements 3 and 4 may or may not be transmitted depending on the specific type of message or its application. A symbolic representation of the message is shown in section A.2.1.

The coded message is transmitted, using Frequency Shift Keying (FSK), in the NWR audio channel. In this application and the implementation currently used by the FCC EAS, it is more accurate to refer to the code format as Audio Frequency Shift Keying (AFSK). It is transmitted at no less than 80% modulation (± 4.0 kHz deviation minimum, ± 5.0 kHz deviation maximum).

The coded portion and the voice portion of the message are transmitted over the NWR transmitter network using standard pre-emphasis for narrow band VHF Frequency Modulation (FM) of 6 dB per octave increasing slope from 200 Hertz (Hz) to 44,000 Hz applied to the modulator.

A.1.1 Preamble. The preamble and header code are transmitted three (3) times, with a one-second pause (±5%) between each coded message burst prior to the broadcast of the actual voice message. The preamble and EOM code are then transmitted three (3) times with a one-second pause (± 5%) between each EOM burst.

A.1.1.1 Preamble Byte. The first 16 bytes (prior to the header code and EOM) of the data transmission constitute a preamble, with each byte having the same value of hexadecimal AB (8-bit byte [10101011]). For all bytes, the least significant bit (LSB) is sent first. The bytes following the preamble constitute the actual message data transmission.

NOTE: For NWR system maintenance, NWS will occasionally send a continuous string of preamble code, hexadecimal AB or a continuous tone through its communications links to the

NWR transmitters, for several seconds up to around one (1) minute. This is done to align the NWR program console, communications links, and transmitters for optimum system performance.

A.1.1.2 Bit Definition. The following definitions of a bit are based on a bit period equaling 1920 microseconds (± one microsecond).

1) The data rate is 520.83 bits per second.
2) Logic zero is 1562.5 Hz.
3) Logic one is 2083.3 Hz.
4) Mark and space bit periods are equal at 1.92 milliseconds.

A.1.2 Header. Each header and EOM data transmission consists of a series string of eight (8) bit bytes similar to standard asynchronous serial communications. There are no start, stop, or parity bits. Bit and byte synchronization is attained by a preamble code at the beginning of each header code or EOM data transmission. Data transmissions are phase continuous at the bit boundary. The message data (header) code is transmitted using American Standard Code for Information Interchange (ASCII) characters, as defined in ANSI International Committee for Information Technology Standards (INCITS) 4-1986 (R2002) for 7-bit ASCII, with the eighth (8th) bit always set to zero (0). Each separate header code data transmission should not exceed a total of 268 bytes if the maximum allowable geographical locations (31) are included.

A.1.3 Warning Alarm Tone (WAT). The WAT, if transmitted, is sent within one (1) to three (3) seconds following the third header code burst. The frequency of the WAT is 1050 Hz (± 0.3%) for 8 to 10 seconds, at no less than 80% modulation (± 4.0 kHz deviation minimum, ± 5.0 kHz deviation maximum).

A.1.4 Voice Message. If transmitted, the actual voiced message begins within three (3) to five (5) seconds following the last SAME code burst or WAT, whichever is last. The voice audio ranges between 20% modulation (± 1 kHz deviation) and 90% modulation (± 4.5 kHz deviation) with occasional lulls near zero and peaks as high as, but not exceeding, 100% modulation (± 5.0 kHz deviation). The total length of the voice message should not exceed two (2) minutes.

A.1.5 Preamble. A repeat of A.1.1.1 above.

A.1.6 End Of Message. EOM is identified by the use of "NNNN".

A.2. MESSAGE CODE FORMAT / PROTOCOL

A.2.1 Symbolic Form

(Preamble) ZCZC-ORG-EEE-PSSCCC-PSSCCC+TTTT-JJJHHMM-LLLLLLLL-
(one second pause)
(Preamble) ZCZC-ORG-EEE-PSSCCC-PSSCCC+TTTT-JJJHHMM-LLLLLLLL-
(one second pause)
(Preamble) ZCZC-ORG-EEE-PSSCCC-PSSCCC+TTTT-JJJHHMM-LLLLLLLL-
(one to three second pause)

1050 Hz Warning Alarm Tone for 8 to 10 seconds - (if transmitted)
(three to five second pause)
Voice /spoken oral text of message - (if transmitted)
(one to three second pause)
(Preamble) NNNN
(one second pause)
(Preamble) NNNN
(one second pause)
(Preamble) NNNN

A.2.2 Symbol Definitions. NOTE: The use of " " is for clarity and emphasis purposes only. They are not part of the SAME message structure.

A.2.3 Preamble. Preamble was previously covered under A.1.1.

A.2.4 "ZCZC". This header code block is the identifier, sent as ASCII characters "ZCZC" to indicate the start of the ASCII header code data transmission.

A.2.5 "-" (Dash). This "Dash" is sent following each type of information code block in the header, except prior to the message valid time.

A.2.6 "ORG". The Originator header code block (ORG) indicates who initiated the message. The only originator codes are:

ORIGINATOR	ORG CODE
Broadcast station or cable system	EAS
Civil authorities	CIV
National Weather Service	WXR
Primary Entry Point System	PEP

A.2.7 "EEE". The Event header code block ("EEE") identifies the type of Event and information contained in the Voice message, if a Voice message is sent. Appendix A.4 of this document lists the approved Event codes. The Event code may be sent with or without a WAT or Voice message as an alerting function only. It also may be sent as a control code for some NWR system control functions.

A.2.8 "PSSCCC". The Geographical Area header code block ("PSSCCC") identifies the geographical area affected by the SAME message. Each location code uniquely identifies a geographical area. A message may contain up to thirty-one (31) Geographical Area blocks.

A.2.8.1 "P". The "P" in the Geographical Area header code block allows for subdividing the area defined by the "CCC" into smaller parts in the case of a very large or uniquely shaped area, or because of widely varying elevation, climate, population, or geographic features. The Part 11 Rules for EAS operation (47 Code of Federal Regulations (CFR) Part 11, 11.56, 3c for location code with PSSCCC format) states, “The use of county subdivisions will probably be rare and generally for oddly shaped or unusually large counties. Any subdivisions must be defined and

agreed to by the local officials prior to use." "P" defines county subdivisions from 0 through 9. The Part 11 rules refer to county "subdivisions", but because the word subdivision may have a different meaning to the public, the NWS prefers to refer to county subdivisions as county partitions, with the overall process referred to as Partial County Alerting (PCA) for NWR and EAS. Broadcasters' EAS encoder/decoder equipment must meet the requirements specified in Part 11. NWS offices will coordinate with local EAS plan participants and users to define area partitions. NWS offices will comply with service change notification procedures described in NWSI 10-1805, *National Public Information Statements and Service Change Notices* for the operational implementation or changes to PCA. In the absence of a local process or procedure to address and define partitions, paragraph 11.31 of FCC Part 11, Emergency Alert System, should be used as guidance.

A county equivalent area can be divided into 2 to 9 partitions. Area partitions may be of unequal size, and will be designed to cover the entire "CCC" area without overlap (e.g., a "panhandle" that is a portion of the larger "CCC" cannot be defined as P = 1 without partitions defined for the rest of the "CCC" area). If an area is partitioned, the following numbering and naming convention should normally be used with the appropriate "P" and associated descriptive partitions used as needed:

1 = Northwest, 2 = North, 3 = Northeast, 4 = West, 5 = Central, 6 = East, 7 = Southwest, 8 = South, 9 = Southeast. (See Figure A-1.) The use of the 0 for "P" would mean that all or an unspecified number of partitions of a county are defined (see Figure A-2).

1 Northwest	2 North	3 Northeast
4 West	5 Central	6 East
7 Southwest	8 South	9 Southeast

Figure A-1: Descriptive Partition Labeling

1 Northwest	2 North	3 Northeast
4 West	0 - All or unspecified partitions 5 Central	6 East
7 Southwest	8 South	9 Southeast

Figure A-2: Non-Specific Labeling

"P" must be in the range of 0 to 9. Valid values of "P" for a particular area depend on the number of partitions created and defined for that area; a county divided into two parts will have three valid numbers (e.g., P = 0, 4 and 6, as shown in the table below). In all cases, P = 0 means

the entire or unspecified area defined by "CCC". If "P" equals a number other than zero, a partition of the area defined by "CCC" is affected. The partitions will be discrete and non-overlapping. The area sum of the partitions will equal the entire county (i.e., NWS operational implementation of PCA in AWIPS does not allow for unassigned portions of a county). For a given county, if PCA is used for both weather and NWEMs, the same partitioning scheme will be used. Some examples of notional partitions are presented in Figure A-3:

"P"	2 Partitions	3 Partitions	5 Partitions	9 Partitions
0	Entire county	Entire county	Entire county	Entire county
1		Northwest county	Northwest county	Northwest county
2				North county
3		Northeast county	Northeast county	Northeast county
4	West county			West county
5			Central county	Central county
6	East county			East county
7			Southwest county	Southwest county
8		South county		South county
9			Southeast county	Southeast county

Figure A-3: Partition Example Table

A.2.8.2 "SS". The State, Territory and Offshore (Marine Area) portion ("SS") of the Geographical Area header code block is the number associated with the state, territory, or offshore marine areas as defined in paragraph 11.31(f) of FCC Part 11 EAS rules. Refer to https://www.weather.gov/marine/wxradio for the listing of Marine Area "SS" codes.

The corresponding data files are available at https://www.weather.gov/gis/EasNWR *in the table row titled "Coastal & Offshore Marine Area Names & Codes for EAS and NWR". Click on the "Download Link" to view or retrieve the most recent data set.*

A.2.8.3 "CCC". The "CCC" in the Geographical Area header code block identifies a county, parish, independent city, or marine area within the United States and its territories. A "CCC" of 000 applies to the entire state or territory identified in the "SS" section of the code. The American National Standards Institute (ANSI) "County and County Equivalents - 2010 FIPS Codes for Counties and County Equivalent Entities" at: https://www.census.gov/library/reference/code-lists/ansi.html#par_statelist is the authoritative source of codes to be used in this field. Refer to https://www.weather.gov/marine/wxradio for the listing of Marine Area "CCC" codes.

The corresponding data files are available at https://www.weather.gov/gis/EasNWR *in the table row titled "Coastal & Offshore Marine Area & Zone Codes, including Marine Synopses, for NWR". Click on the "Download Link" to view or retrieve the most recent data set.*

IMPORTANT NOTES Regarding the "PSSCCC" Code Block:

1) The Geographical Area header code block transmitted over NWR frequencies, but ORIGINATED INITIALLY by security or communication centers at special hazardous materials storage or production facilities, may contain a combination of numbers, letters,

and other characters. These become special location codes containing a combination of geographical and instructional information to activate customized receivers, pre-stored text messages, and/or other special equipment.

The authorized ASCII character set for these special location codes is restricted to decimal 10 ("new line") and 13 ("carriage return"); and decimal 33 ("!") through 127 ("delete") excluding ASCII characters decimal 43 ("+") and 45 ("-"). ASCII characters decimal 43 and 45, may not be part of this six-character header code block, but used only at the end of the block as shown previously in the symbolic form. The ASCII character decimal 42 ("*"), is reserved for use as a wild card only.

2) The special location codes described in Note 1 above, WILL NOT be sent as part of NWS authored SAME messages. NWR receivers with SAME decoders should not respond to such codes for NWR or EAS purposes.

Specially designed receivers are required to alert the special location codes. Systems receiving NWR broadcasts and providing further redistribution may want to pass them along in any retransmission of the header code. Radio, television or cable systems covered by FCC Rules Part 11, are not prohibited from using these codes in peripheral equipment or ancillary functions to basic EAS equipment to further enhance the safety of the public in cooperation with local government officials or facility managers.

3) An NWR or EAS text standard over and above this special application of the location code is not defined under these specifications or EAS rules. A text standard could be developed using the basic SAME EAS protocol, but identified as a text message using a variation of the Originator Code. The Originator Code in this section is reserved for voice messages only and decoders should reject any messages that do not match this currently defined code set.

4) Numbers from 900 to 999 in the "CCC" segment of the Geographical Area header code block are reserved for assignment to unique non-FIPS defined alerting areas adjacent to facilities that store or produce nuclear, chemical and biological material. Specially designed receivers should not be required to alert for the 900 number series.

A.2.9 +TTTT. The Purge time header code block (+TTTT) identifies the purge time of the message expressed in a delta time from the issue time in 15-minute segments up to one hour, then in 30-minute segments beyond one hour up to six hours[3]; i.e., +0015-, +0030-, +0045-, +0100-, +0430-, +0600-. This delta time, when added to the issue time, specifies when the message is no longer valid and should be purged from the system, not to be used again. Note that the valid or purge time of the message will not always equal the event ending time in NWS Valid Time Event Code (VTEC). For most short-term events such as tornadoes and severe thunderstorms, the two times will most often be identical. For longer duration events such as a hurricane or winter storm that may not end for many hours or days, the valid time in the code

[3] The six-hour upper limit will be changed to an upper limit of 99 hours, 30 minutes in early 2022 after announcement in a future NWS Service Change Notice found online at https://www.weather.gov/notification/#scn.

only applies to that message, and is not an indicator when the threat is over. This block is always preceded by "+".

A.2.10 "JJJHHMM". This header code block identifies the Julian calendar date and the time the message was originally disseminated in hours and minutes using the 24-hour Coordinated Universal Time (UTC) clock.

A.2.11 "LLLLLLLL". This header code block identifies the originator of the message, or in the case of the EAS, that of a re-broadcasting the message. Many NWS offices use the International Civil Aviation Organization (ICAO) location identifiers (first four letters), e.g., KDTX/NWS for Detroit, MI and KTOP/NWS for Topeka, KS. Radio and television stations use the station's call sign such as KFAB/AM or WDAF/FM.

A.2.12 "NNNN". This code block is the EOM code.

A.3. MESSAGE EXAMPLES

Three examples of a TORNADO warning (TOR) are provided in subsections A.3.1, A.3.2 and A.3.3. This will allow readers to see the variance in the message construction. Other examples include: Regular Weekly Test (RWT) Message (A.3.4), a non-critical message – Special Weather Statement (A.3.5), a special SAME code message to the transmitter (A.3.6), and a test message format for NWS personnel (A.3.7).

A.3.1 Most Common Code Transmission with Critical Voice Warning Message

(Preamble [16 bytes]) ZCZC-WXR-TOR-039173-039051-139069+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-TOR-039173-039051-139069+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-TOR-039173-039051-139069+0030-1591829-KCLE/NWS-
(one to three second pause)
(Warning Alarm Tone transmitted for eight to ten seconds)
(three to five second pause)
(Voice text of the Tornado Warning Message)
(one to three second pause)
(Preamble [16 bytes]) NNNN (one second pause) (Preamble [16 bytes]) NNNN (one second pause) (Preamble [16 bytes]) NNNN

This example is a tornado warning for Wood, Fulton, and northwest Henry counties in Ohio and valid for 30 minutes from the issue time of 1829 UTC (which was 2:29 PM local time) on the 159th day of the Julian Calendar, from the NWS office in Cleveland, OH.

NOTE: A visual message for television or special display for the deaf could be created by a small microprocessor and appear as shown below.

"THE NATIONAL WEATHER SERVICE OFFICE IN CLEVELAND OHIO HAS ISSUED A TORNADO WARNING EFFECTIVE UNTIL 3 PM EDT FOR PEOPLE IN THE

FOLLOWING COUNTIES IN OHIO ... WOOD ...FULTON...AND NORTHWEST HENRY." (Some pre-*stored* call to action and a recommendation to monitor TV or another special source could be included.).

A.3.2 Code Transmission of Critical Voice Message with No Warning Alarm Tone

(Preamble [16 bytes]) ZCZC-WXR-TOR-039173-039051-139069+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-TOR-039173-039051-139069+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-TOR-039173-039051-139069+0030-1591829-KCLE/NWS-
(NO Warning Alarm Tone transmitted)
(three to five second pause)
(Voice text of the Tornado Warning Message)
(one to three second pause)
(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN

This example is a message broadcast over the NWR. It is intended for retransmission by an FCC EAS Local Primary (LP) radio and/or television station where the event threatens an area outside of the service area of the NWR, but is covered by the LP and other stations in the service area of the NWR. Users with analog WAT type NWR receivers will not be alerted and those with SAME decoder receivers would likely not have those geographical areas programmed in their units and if they did it would be because they wanted to be alerted.

NOTE: A visual message for television or special display for the deaf could be created by a small microprocessor and appear as shown below.

"THE NATIONAL WEATHER SERVICE OFFICE IN CLEVELAND OHIO HAS ISSUED A TORNADO WARNING EFFECTIVE UNTIL 3 PM EDT FOR PEOPLE IN THE FOLLOWING COUNTIES IN OHIO ... WOOD ...FULTON...AND NORTHWEST HENRY."

(Some pre-stored call to action and a recommendation to monitor TV or another special source could be included.).

A.3.3 Transmission of Critical Event Code, but with No Warning Alarm Tone or Voice Message

(Preamble [16 bytes]) ZCZC-WXR-TOR-039173-039051-139069+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-TOR-039173-039051-139069+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-TOR-039173-039051-139069+0030-1591829-KCLE/NWS-
(NO Warning Alarm Tone Transmitted) (NO Voice Message Broadcast)

(one to three second pause)
(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN

This is an example of a special SAME code only broadcast. It is intended for re-transmission by an FCC EAS LP radio and/or television station for the purpose of notifying other stations in the EAS network and emergency management officials outside the coverage of the NWR station. In the application of this example, the event threatens a location outside the service area of the NWR, but is covered by the LP. Users with analog WAT type NWR receivers will not be alerted and those with SAME decoder receivers would not likely have those areas programmed in their units. If they did, it would be because they did want to be alerted. The use of this method over the NWR will be rare, to solve a very unique problem, and confined to more rural areas.

NOTE: A visual message for television or special display for the deaf could be created by a small microprocessor and appear as shown below.

"THE NATIONAL WEATHER SERVICE OFFICE IN CLEVELAND OHIO HAS ISSUED A TORNADO WARNING EFFECTIVE UNTIL 3 PM EDT FOR PEOPLE IN THE FOLLOWING COUNTIES IN OHIO ... WOOD ...FULTON...AND NORTHWEST HENRY."

(Some pre-stored call to action and a recommendation to monitor TV or another special source could be included.).

A.3.4 Code Transmission and Associated Message for Required Weekly Test

(Preamble [16 bytes]) ZCZC-WXR-RWT-020103-020209-020091-020121-029047-029165-029095-029037+0030-3031700-KEAX/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-RWT-020103-020209-020091-020121-029047-029165-029095-029037+0030-3031700-KEAX/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-RWT-020103-020209-020091-020121-029047-029165-029095-029037+0030-3031700-KEAX/NWS
(one to three second pause)
(Warning Alarm Tone transmitted for eight to ten seconds)
(three to five second pause)
(Brief Voice text of the weekly test describing the service provided, area covered, and application of the warning alarm tone and SAME code)
(one to three second pause)

(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN

(one second pause)
(Preamble [16 bytes]) NNNN

This is an example of a Required Weekly Test (RWT) of the NWR, WAT, and SAME that covers the Kansas City metropolitan area. It was transmitted at 1700 UTC (11:00AM CST) on the 303rd day of the Julian calendar, from the NWS office located at Pleasant Hill, MO.

NOTE: *Some NWS offices are more active participants in the local operational areas of the FCC's EAS by periodically initiating the Required Monthly Test. These tests normally coincide with the time the NWS conducts its routine weekly tests. In these cases, the RWT code for Required Weekly Test will be replaced with the code, RMT, for the Required Monthly Test. No other NWR test using the RWT code for that week would be conducted.*

A.3.5 Transmission of Non-Critical Event Code with No Warning Alarm Tone, but with a Voice Message

(Preamble [16 bytes]) ZCZC-WXR-SPS-039173-039051-139069+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-SPS-039173-039051-139069+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-SPS-039173-039051-139069+0030-1591829-KCLE/NWS-
(NO Warning Alarm Tone transmitted)
(one to three second pause)
(Voice message of the Special Weather Statement)
(one to three second pause)
(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN

This is an example of a non-critical message broadcast (Special Weather Statement) over the NWR with the SAME code, and not intended for the EAS. Its primary use would be for recording and playback by automated or unattended radio stations, redistribution by other service providers such as pagers, along with a wide variety of other applications.

Special Note: The use of this coded message for routine, non-critical messages (e.g., forecasts, weather roundups and climate summaries, among others as illustrated in this example) is not yet in use. When implemented, the code will precede the "initial" or "update" of nearly all its messages broadcast over the NWR.

NOTE: A visual message for television or special display for the deaf could be created by a small microprocessor and appear as shown below.

"THE NATIONAL WEATHER SERVICE OFFICE IN CLEVELAND OHIO HAS ISSUED A TORNADO WARNING EFFECTIVE UNTIL 3 PM EDT FOR PEOPLE IN THE

FOLLOWING COUNTIES IN OHIO ... WOOD ...FULTON...AND NORTHWEST HENRY."

(Some pre-stored call to action and a recommendation to monitor TV or another special source could be included.).

A.3.6 Transmission of a System Control Code but With No Warning Alarm Tone or Voice Message

(Preamble [16 bytes]) ZCZC-WXR-TXB-039173+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-TXB-039173+0030-1591829-KCLE/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-TXB-039173+0030-1591829-KCLE/NWS-
(NO Warning Alarm Tone transmitted) (NO Voice Message broadcast)
(one to three second pause)
(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN

This is an example of a special SAME code. It is broadcast only to control equipment served by the NWS WFO in Cleveland. In this case, it is an instruction to the NWR system located in state/county number 039173 (Wood County, Ohio) to switch to the backup transmitter.

A.3.7 Code Transmission and Associated Message for a Demonstration, Operational Staff or Other Type Exercise

(Preamble [16 bytes]) ZCZC-WXR-DMO-999000+0030-1561634-KEAX/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-DMO-999000+0030-1561634-KEAX/NWS-
(one second pause)
(Preamble [16 bytes]) ZCZC-WXR-DMO-999000+0030-1561634-KEAX/NWS-
(one to three second pause)
(***1050 Hz Warning Alarm Tone NOT transmitted***. However, for realism, a non-alerting tone at another frequency might be transmitted for eight to ten seconds.).
(one to three second pause)

(A brief voice text of a message describing the reason for the interruption of normal service for someone who may have been coincidentally listening to the standard weather broadcast.).

(one to three second pause)
(Preamble [16 bytes]) NNNN
(one second pause)
(Preamble [16 bytes]) NNNN
(one second pause)

(Preamble [16 bytes]) NNNN

The use of the "DMO" event code has three types of applications.

1. The "DMO" event code provides NWS field office personnel a means of conducting exercises to practice issuing authentic warnings and other critical messages without disrupting the EAS network or turning on industrial and general public receiver decoders, unless optionally selected by the user. The event code "DMO" should not normally be programmed into receivers and the location code of "999000" does not match any existing or future geographical area codes.

2. This type of code transmission is used to demonstrate over the air in real time alert and broadcast of an emergency message over NWR and/or the EAS. A SAME receiver or EAS decoder could be set up to respond to the "DMO" event code and a location code as follows:

    a. If the "999000" location code is used, only the programmed receiver unit would respond to provide a realistic demonstration.
    b. If a real location code is used, any receiver unit within range of the NWR transmitter programmed to respond to the "DMO" event code and the real location code would respond to provide a realistic demonstration. Demonstrations using a real location code should be conducted only after coordination with public safety officials, broadcasters, and public awareness announcements in the NWR transmitter Broadcast Service Area.

3. A third use is as a maintenance aid to align/test the SAME communications link or to check newly installed or repaired NWR receiver or EAS decoders at EAS media facilities, cable television hubs, or similar facilities which have specialized needs or will redistribute to other users. To thoroughly test the system, the user programs in the event code "DMO" and location code "999000" and sets the receiver decoder or other equipment to perform the desired task. When the NWS sends the code as shown in the example, the system should be able to perform the desired task at the receive site. If a more detailed test is required, the receive site can program the actual desired event code, but use the location code "999000". After that test, the receive site could program in event code "DMO" and the desired location code. None of these three code transmissions should cause any other equipment to respond since they should not have the "DMO" and "999000" combination or the "999000" combined with any other event or a real location code paired with the event code "DMO". At the conclusion of the demonstration/test, the receive site should program only the desired event pair and location codes and remove the "DMO" event and "999000" location codes.

A.4. EVENT CODES

A.4.1 NWR-SAME / EAS Weather Related Events – Optional for FCC regulated broadcast stations

NATURE OF ACTIVATION	NWR-SAME	SPANISH TRANSLATION CODE
Blizzard Warning	BZW	Aviso de ventisca
Coastal Flood Watch	CFA	Vigilancia de inundaciones costeras
Coastal Flood Warning	CFW	Aviso de inundaciones costeras
Dust Storm Warning	DSW	Aviso de vendava de polvo
Extreme Wind Warning	EWW	Advertencia de viento extremo
Flash Flood Watch	FFA	Vigilancia de inundaciones repentinas
Flash Flood Warning	FFW	Aviso de inundaciones repentinas
Flash Flood Statement	FFS	Comunicado de inundaciones repentinas
Flood Watch	FLA	Vigilancia de inundación
Flood Warning	FLW	Aviso de inundación
Flood Statement	FLS	Advertencia de inundación
High Wind Watch	HWA	Vigilancia de vientos Fuertes
High Wind Warning	HWW	Aviso de vientos Fuertes
Hurricane Watch	HUA	Vigilancia de huracán
Hurricane Warning	HUW	Aviso de huracán
Hurricane Statement	HLS	Comunicado de huracán
Severe Thunderstorm Watch	SVA	Vigilancia de tronada severa
Severe Thunderstorm Warning	SVR	Aviso de tronada severa
Severe Weather Statement	SVS	Advertencia de tiempo severo
Special Marine Warning	SMW	Aviso marítimo especial
Special Weather Statement	SPS	Comunicado especial del estado del tiempo
Snow Squall Warning	SQW[4]	Advertencia de tormenta de nieve
Storm Surge Warning	SSW	Advertencia de marejada ciclónica
Storm Surge Watch	SSA	Vigilancia de marejada ciclónica
Tornado Watch	TOA	Vigilancia de tornado
Tornado Warning	TOR	Aviso de tornado
Tropical Storm Watch	TRA	Vigilancia de tormenta tropical
Tropical Storm Warning	TRW	Aviso de tormenta tropical
Tsunami Watch	TSA	Vigilancia de tsunami
Tsunami Warning	TSW	Aviso de tsunami
Winter Storm Watch	WSA	Vigilancia de tormenta de nieve
Winter Storm Warning	WSW	Aviso de tormenta de nieve

A.4.2 SAME / EAS Non-Weather-Related Events

A.4.2.1 National Codes – Required for FCC regulated broadcast stations

NATURE OF ACTIVATION	NWR-SAME	SPANISH TRANSLATION CODE
Emergency Action Notification	EAN (note 1)	Anuncio de acción urgenteion
National Information Center	NIC (note 1)	Mensaje del Centro Nacional de información

[4] Snow Squall Warnings are not conveyed to the EAS.

National Periodic Test	NPT	Prueba periódica nacional
Required Monthly Test	RMT	Prueba mensual obligatoria
Required Weekly Test	RWT	Prueba semanal obligatoria

A.4.2.2 State and Local Codes – Optional for FCC regulated broadcast stations

NATURE OF ACTIVATION	NWR-SAME	SPANISH TRANSLATION CODE
Administrative Message	ADR	Mensaje administrative
Avalanche Watch	AVA	Vigilancia de avalancha
Avalanche Warning	AVW	Aviso de avalancha
Blue Alert	BLU	Alerta Azul sobre policia
Child Abduction Emergency	CAE	Emergencia de rapto de menores
Civil Danger Warning	CDW	Aviso de peligro civil
Civil Emergency Message	CEM	Mensaje de emergencia
Civil Earthquake Warning	EQW	Aviso de terremoto
Evacuation Immediate	EVI	Evacuación inmediata
Fire Warning	FRW	Aviso de fuego
Hazardous Materials Warning	HMW	Aviso de materiales peligrosos
Law Enforcement Warning	LEW	Aviso de las autoridades de la ley
Local Area Emergency	LAE	Emergencia de área local
911 Telephone Outage Emergency	TOE	Interrupción telefónica 911
Nuclear Power Plant Warning	NUW	Aviso de riesgo nuclear
Radiological Hazard Warning	RHW	Aviso de peligro radiológico
Shelter In Place Warning	SPW	Aviso de refugio
Volcano Warning	VOW	Aviso de actividad volcánica

A.4.2.3 Administrative Events – Optional for FCC regulated broadcast stations

NATURE OF ACTIVATION	NWR-SAME	SPANISH TRANSLATION CODE
Network Message Notification	NMN	Anuncio de mensaje en red
Practice/Demo Warning	DMO	Práctica/Demostración

A.4.3 SAME / Non-EAS Event Codes

These NWR control codes are unique to the NWS for use in remotely controlling NWR transmitters. These codes are not intended to be implemented on SAME-capable receivers.

These codes are not included in the EAS per the Amendment of Part 11 of the FCC Rules, as presented in the EAS Report and Order released February 26, 2002, which became effective May 16, 2002.

NATURE OF ACTIVATION	NWR-SAME	SPANISH TRANSLATION CODE
Transmitter Carrier Off	TXF	Frecuencia portadora de emission
Transmitter Carrier On	TXO	Frecuencia portadora de emission activada
Transmitter Backup On	TXB	Transmisor de respaldo activado

Transmitter Primary On	TXP	Transmisor principal activado

Section A.4.33.1 Footnote:

(Note 1) These codes are for use by the FCC and the Federal Emergency Management Agency (FEMA) for distribution of national messages over the EAS. It is unlikely in the near future the NWS will INITIATE the transmission of these codes over the NWR. These codes, however, may be retransmitted over the NWR where EAS equipment is installed on a NWR program line and the NWR system is serving as an EAS LP station.

A.5. EVENT CODE CATEGORIES

With the exception of TOR (Tornado Warning), SVR (Severe Thunderstorm Warning), EVI (Evacuation Immediate), and BLU (Blue Alert) identified in the previous section and the NWR control codes, the third character in most existing and future event codes is limited as follows:

1) W for Warning
2) A for Watch
3) E for Emergency
4) S for Statement

A.5.1 Warning - Those events that alone pose a significant threat to public safety and/or property, probability of occurrence and location is high, and the onset time is relatively short.

A.5.2 Watch - Meets the classification of a warning, but either the onset time, probability of occurrence or location is uncertain.

A.5.3 Emergency - An event that by itself would not kill or injure or do property damage, but indirectly may cause other things to happen that result in a hazard. For example, a major power or telephone loss in a large city alone is not a direct hazard but disruption to other critical services could create a variety of conditions that could directly threaten public safety.

A.5.4 Statement - A message containing follow up information to a warning, watch, or emergency.

APPENDIX B - SAME Receiver Performance Recommendations and Considerations[5]

B.1. SAME Receiver/Decoders' Use of the Partition Part of the Location Code

SAME receiver decoders should be designed so that if the unit has a partition in the geographical area (location) code stored for processing (e.g., 129139), it will also respond to a transmitted code from the NWS that has only the zero in the partition part of the location code, (e.g., 029139). The zero signifies ALL or an unspecified part of the coded location, therefore, for safety purposes, the decoder should respond to the zero-partition code because the zero implies the partitioned area is potentially affected. On the other hand, if the receiver/decoder unit uses a default of zero in the partition part of the location code (e.g., 029139), it should respond to any transmitted partitioned location code which otherwise matches the "SS" and "CCC" part of the code (e.g., 129139). The use of the zero in the receiver/decoder location code implies the user wants to be alerted for an event anywhere within the geographical area defined by the location code.

In the future, SAME codes may appear on the initial broadcast or update of routine type messages such as forecasts, weather roundups, climate summaries, statements, river, lake, and tide stages among others. Equipment at radio stations could, for example, capture just the Voice part of a forecast or weather roundup, store it, and then play it back at scheduled times or as needed for event-driven messages such as special statements.

B.2. Requirement to Decode a Discrete Event and Location Pair

For industrial, commercial, and especially EAS type applications, any alerting or activation process should be conditional on matching a discrete pair of specific event and a specific location code. Except in the most basic and simple application in consumer type products, decoders should avoid having a table of event codes and a separate table of location codes. For example, an event table consists of: TOR, FFW, CFW, and SMW. The location table includes: 033001, 033005, 033011, 075709, and 075711.

In this arrangement, the system will respond if any transmitted code is in the event table and in the location table. Users will often need to have the ability for the system to respond to a TOR for 033001 and 033005 but not from 033011, however, it needs a FFW for 033011, but not for 033005. Therefore, a single lookup or matching table should be created so each event is paired with a discrete location, (e.g., [TOR\033001], [TOR\033005], [FFW\033011], [CFW\033005], [SMW\075711], and [SMW\075709]).

Consumer type equipment may be able to use a two table approach versus discrete pairs because the interest or need for information for any hazardous event will likely be confined to just one or possibly two location codes reducing the number of receiver activations by as much as 80 to 90 percent. Otherwise, there would be little advantage of having a SAME decoding unit if the user is interested in many events for a large area.

B.3. Code Error Checking

[5] It is expected that the use of Appendix B will be in conjunction with Appendix A, which is required for the understanding of the concepts and abbreviations within this appendix.

For best receiver decoder performance, it is recommended that a software algorithm confirm that at least two of the three header code transmissions are identical before declaring a match or valid code and performing the preprogrammed task. If this test fails, do a bit-by-bit check of the three transmissions and attempt to reconstruct a valid code by comparing the bits in each position in each header code transmission and accepting as the valid bit that bit which appears in two of the three header code transmissions.

B.4. End Of Message Decode

For SAME applications, a valid EOM does not need to be conditional on the receipt of all four (4) N's in three separate bursts. For SAME applications, an EOM can be considered valid if the decoder detects the preamble followed by at least one, but preferably two (2) N's. The preamble and any number of N's will never be sent except at the end of the message.

B.5. Multiple Messages

NOAA Weather Radio Receivers (with and without the SAME function) should be able to receive and disseminate messages at the rate they are broadcast from the NWR transmitter. Higher priority messages that may be sent immediately following a routine or scheduled NWR transmission should not degrade the previous message or cause those contents to be lost.

B.6. Plain Language Text Messages Produced From the Header Code

Devices that create a plain language text message from the header code should pay special attention to the definition of the "+TTTT-" part of the code described in section A.2.1. Any text message should avoid the implication that the EVENT defined by the "EEE" part of the header code expires at the time determined by the issue time plus the delta time defined by the "+TTTT-" part of the header code.

Wording similar to the following would be a more accurate statement especially for longer term events and would also apply to short fused events as well by substituting the appropriate time from the "+TTTT-" part of the header code: "THIS EVENT IS EXPECTED TO LAST FOR AT LEAST 6 HOURS OR LONGER. PLEASE STAY TUNED FOR MORE DETAILS." If the unit has a real time clock and enough processing and storage capacity to calculate a time, the message might read as follows regardless of the "+TTTT-": "THIS EVENT IS EXPECTED TO LAST UNTIL AT LEAST HH:MM OR LONGER. PLEASE STAY TUNED FOR MORE DETAILS."

If the text message is expected to be read by someone without access to hearing the NWR or other media voice broadcasts, the second sentence should use language directing them to an appropriate alternate source.

B.7. External DC Power Source

SAME receiver/decoders should be equipped with a suitable connector so it can be powered from an external 12 VDC source for operation away from commercial power outlets. This would allow the unit to be powered by car, truck, boat, or camper 12 VDC power systems through a source such as a cigarette lighter receptacle. A typical 9 VDC internal emergency backup battery, though desirable during loss of commercial power, may not power the unit in a continuous monitoring mode for more than a few hours when removed from commercial power.

This would reduce the value of the radio as a warning device for people in remote, vulnerable situations.

B.8. Recognition of Non-NWS Originator Code

SAME receiver/decoders should be offered to consumers that also accept and process any messages broadcast over the NWR with any EAS authorized originator codes. In addition to the WXR that identifies the NWS as an originator, it should include codes listed in the FCC Report and Order dated February 26, 2002: PEP for the Primary Entry Point System, CIV for Civil Authorities, and EAS for Broadcast stations or cable systems. The NWR is evolving into a more comprehensive local, state, regional, and national warning system in keeping with its objective as an "All Hazards" source of information. NWR broadcasts Non-Weather Emergency Messages (NWEMs) at the request of federal, state, tribal, and local alerting authorities to provide time-critical, life- or property-saving emergency information. The NWEMs are broadcast with SAME and include the CIV Originator Code.

A few NWR transmitter sites may be equipped with EAS devices to support the critical warning needs of unique hazardous material storage or production facilities. In the future, the NWS may allow for the expanded installation of these types of EAS devices to support state and local distribution of non-weather-related emergency messages through the NWR and as a means to enter the EAS network. These messages could be potentially as important to owners of NWR receivers as a weather-related message. Even though the message may be originally disseminated over the NWR, it would not originate from the NWS and therefore not have a WXR origination code. To ensure owners of NWR receivers receive the maximum protection possible from the system, NWR-SAME receivers should accept any originator code.

B.9. Receiver Tests

The NWS tests the NWR and SAME alerting technology weekly. These tests normally occur on Wednesday between 10 AM and 12 noon local time, with some variations to accommodate local requirements. Some NWS offices actively participate in the local operational areas of the FCC EAS by periodically initiating the Required Monthly Test. These tests normally coincide with the time the NWS conducts its routine weekly tests. In these cases, the RWT code for Required Weekly Test will be replaced with the code, RMT, for the Required Monthly Test. No other NWR test using the RWT code for that week would be conducted. These tests are postponed to the next good weather day, if threatening weather is occurring or possible at or near the time of the routine or scheduled test.

All types of NWR-SAME compatible receivers should respond to these tests in some form. There are two basic methods from which there are several variations. The first method is for the receiver to display a message or have some other visual indication the unit has successfully been tested. Another approach is for the unit to notify the user only when the unit's internal software suspects an error.

Use of the visual positive and/or routine display of a successful test should not be based on the valid time of the message in the header. This is normally set to 15 minutes because that is the minimum time the NWR system will accept. The system should not purge for upwards of 12 hours. This would allow for those not able to observe the test (i.e., working outside the home) to

see that the receiver has been successfully tested. A purge time of 12 hours would ensure the largest number of people being able to acknowledge the test. Any real message for the area programmed in the receiver would automatically replace the test message.

The other method of testing the unit would occur after the receiver has not received a test message, Required Weekly Test (RWT) or Required Monthly Test (RMT), or another code associated with a real event within some time frame. For example, if the unit does not receive a valid event code for a real event or test within, say 8 or 9 days (192/216 hours), the unit would display a message to check the receiver. Both of the above suggestions should be based on the receiver getting a valid RWT, RMT or another event code associated with a real message, and one of the geographical codes programmed in the receiver. The NWS sends all the geographical codes that apply to the service area of the monitored transmitter with each test message. The receiver should check to ensure at least one of the transmitted geographical codes matches one of those programmed in the unit. If it does not, then the unit should inform the user there may be something wrong. Just having the receiver acknowledge receipt of "a" or "any" code string would not be enough.

It is important to note that the event code "DMO" [Practice/Demo Warning] is not intended to be used as part of any routine testing. The event code "DMO" is to be used only as described in Appendix A.

If an output is provided to activate external alarms, i.e., strobe light, siren, pillow shaker, etc., at a minimum, a manual test capability that can be used to activate the output should be provided. A more elegant manual receiver test would include the internal generation of SAME code sequences using the user programmed Event and Location codes in the receiver.

See section 2 of this directive concerning information on Consumer Technology Association (CTA) Standard 2009-B R-2016, “Performance Specification for Public Alert Receivers”.