

# GY

中华人民共和国广播电视和网络视听行业标准

GY/T 391—2023

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## 中波调幅广播应急广播技术规范

Technical specification for emergency broadcasting of medium wave AM

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## 前 言

本文件按照GB/T 1.1—2020《标准化工作导则 第1部分：标准化文件的结构和起草规则》的规定起草。

本文件由全国广播电影电视标准化技术委员会（SAC/TC 239）归口。

本文件起草单位：国家广播电视总局广播电视规划院、国家广播电视总局广播电视科学研究院、国家广播电视总局无线电台管理局、浙江省中波发射管理中心、杭州图南电子股份有限公司、成都德芯数字科技股份有限公司、北京蓝拓扑科技股份有限公司、北京天地通信息技术有限公司、北京数码视讯软件技术发展有限公司、上海数字电视国家工程研究中心有限公司、湖南康通电子股份有限公司。

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## 引 言

本文件的发布机构提请注意，声明符合本文件时，可能涉及到第6章、第7章与“一种紧急广播信令的发送及接收方法”相关的专利的使用。

本文件的发布机构对于该专利的真实性、有效性和范围无任何立场。

该专利持有人已向本文件的发布机构承诺，他愿意同任何申请人在合理且无歧视的条款和条件下，就专利授权许可进行谈判。该专利持有人的声明已在本文件的发布机构备案，相关信息可以通过以下联系方式获得。

专利持有人姓名：国家广播电视总局广播电视科学研究院。

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# 中波调幅广播应急广播技术规范

## 1 范围

本文件规定了中波调幅广播的应急广播消息传输机制、应急广播消息封装协议、信道编码和调制、中波发射台站对应急广播消息的处理要求和中波应急广播接收终端对应急广播消息的解调接收和处理要求。

本文件适用于中波调幅广播应急广播系统的设计、开发、建设、验收、运行和维护。

## 2 规范性引用文件

下列文件中的内容通过文中的规范性引用而构成本文件必不可少的条款。其中，注日期的引用文件，仅该日期对应的版本适用于本文件；不注日期的引用文件，其最新版本（包括所有的修改单）适用于本文件。

- GB/T 2312—1980 信息交换用汉字编码字符集 基本集
- GB/T 4880.2—2000 语种名称代码 第2部分：3字母代码
- GB/T 13000—2010 信息技术 通用多八位编码字符集（UCS）
- GB/T 15273.1—1994 信息处理 八位单字节编码图形字符集 第1部分：拉丁字母一
- GB 16959—1997 信息技术 信息交换用藏文编码字符集 基本集
- GB 18030—2022 信息技术 中文编码字符集
- GB/T 21669—2008 信息技术 维吾尔文、哈萨克文、柯尔克孜文编码字符集
- GY/T 383—2023 应急广播系统总体技术规范
- GY/T 384—2023 应急广播平台接口规范
- GY/T 385—2023 应急广播消息格式规范
- GY/T 386—2023 应急广播系统资源分类及编码规范
- GY/T 389—2023 应急广播系统数字签名技术规范

## 3 术语和定义

GY/T 383—2023界定的以及下列术语和定义适用于本文件。

### 3.1

#### 应急信息 emergency information

县级以上人民政府或其指定的部门因突发事件/紧急情况而发布的信息。

注：应急信息按照紧急程度、发展态势、危害程度等，分为紧急类和非紧急类。

[来源：GY/T 383—2023，3.1]

### 3.2

#### 应急广播 emergency broadcasting

利用广播电视、网络视听等信息传送方式，向公众或特定区域、特定人群播发应急信息的传送播出系统。

[来源：GY/T 383—2023，3.2]

### 3.3

**应急广播消息** emergency broadcasting message; EBM

各级应急广播平台之间,以及应急广播平台到广播电视播出系统、应急广播传输覆盖网之间传递的,根据应急信息生成的应急广播播发相关数据。

注:包括应急广播消息指令文件、应急广播消息指令签名文件、应急广播节目资源文件等。

[来源:GY/T 383—2023, 3.3]

### 3.4

**应急广播适配器** emergency broadcasting adapter

接收、解析、验证应急广播消息,并向广播电视和网络视听系统进行协议转换、签名、封装和存储的设备。

[来源:GY/T 383—2023, 3.5]

### 3.5

**中波应急广播传输唤醒指令** wake-up command for emergency broadcasting of medium wave AM

在中波广播信道中传输、用于唤醒终端的指令。

### 3.6

**数字签名** digital signature

附加在数据单元上的一些数据,或是对数据单元做密码变换,这种附加数据或密码变换被数据单元的接收者用以确认数据单元的来源和完整性,达到保护数据、防止被非法伪造的目的。

[来源:GY/T 383—2023, 3.6]

### 3.7

**中波应急广播接收终端** emergency broadcasting terminal of medium wave AM

具有接收中波应急广播传输唤醒指令,并被唤醒播出应急广播内容的中波接收终端。

## 4 缩略语

下列缩略语适用于本文件。

AM 调幅 (Amplitude Modulation)

BCD 二进制十进数 (Binary Coded Decimal)

FEC 前向纠错编码 (Forward Error Correction)

LDPC 低密度奇偶校验 (Low Density Parity Check)

MSK 最小频移键控 (Minimum Shift Keying)

PN 伪随机 (Pseudo-Noise)

UTC 协调世界时 (Universal Time Coordinated)

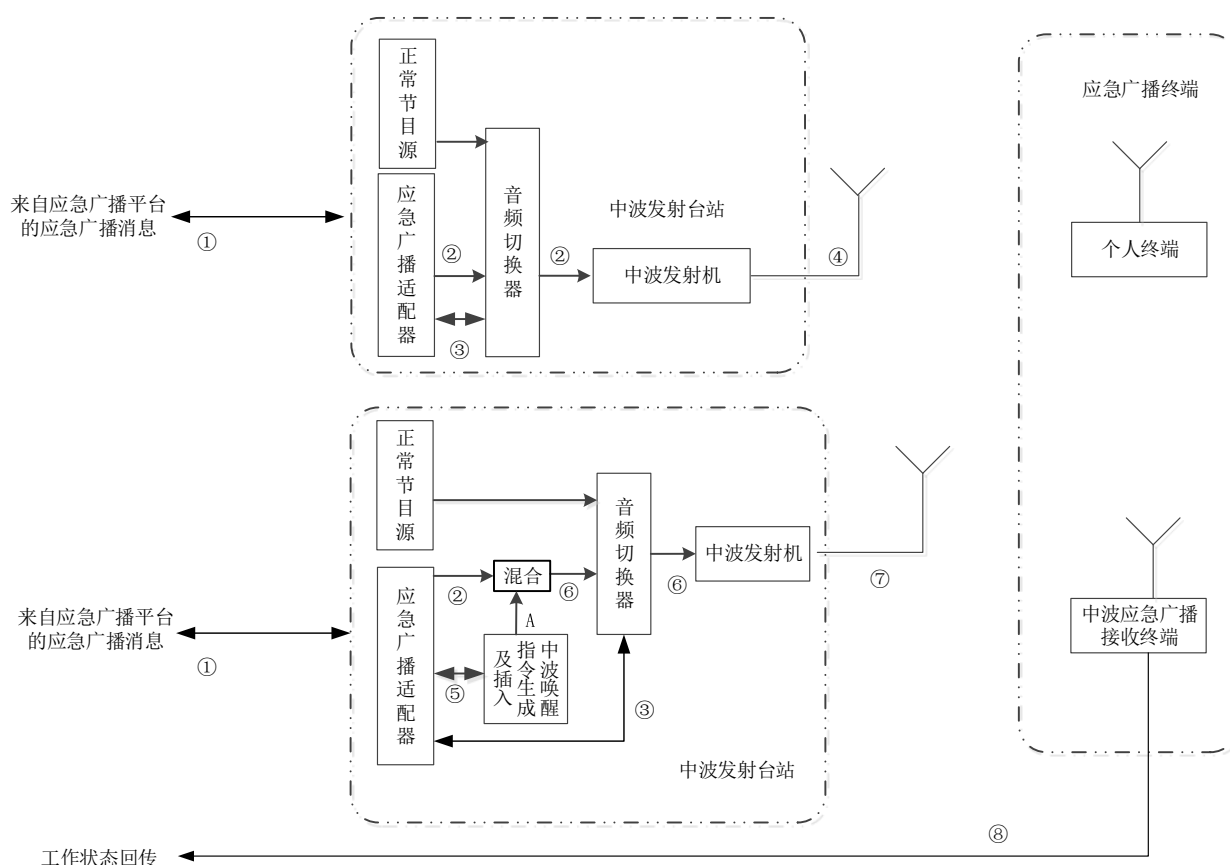
uimsbf 无符号整数,高位在先 (unsigned integer, most significant bit first)

## 5 约定

本文件中除特别说明外,传输时每个字节都是高位在先,低位在后。

## 6 中波调幅广播应急广播概述

中波调幅广播应急广播系统架构见图1。



图中数据信号类型及符号说明：

- ①——来自应急广播平台的应急广播消息；
- ②——经应急广播适配器处理后输出的应急广播音频节目信号；
- ③——音频切换器控制指令；
- ④——包含应急广播音频节目的中波射频信号；
- ⑤——中波唤醒指令生成及调制设备控制协议；
- ⑥——包含唤醒指令的应急广播音频节目信号，唤醒指令格式见第7章；
- ⑦——包含唤醒指令的应急广播音频节目的中波射频信号；
- ⑧——终端工作状态回传；
- A ——应急广播唤醒指令（MSK信号）。

图1 中波调幅广播应急广播系统架构

中波发射台站的应急广播适配器在接收到应急广播消息后，应急广播适配器控制音频切换器将原中波音频节目信号切换，经中波发射机输出中波射频信号，正在接收该频率的个人终端将接收到应急广播节目；在需要终端唤醒时，应急广播适配器控制音频切换器输出加入应急广播唤醒指令（MSK信号）后的应急广播音频节目信号，经中波发射机输出中波射频信号，中波应急广播接收终端响应唤醒指令，接收并播放应急广播节目。

## 7 中波应急广播传输唤醒指令封装协议

### 7.1 中波应急广播传输唤醒指令数据包通用格式

中波应急广播传输唤醒指令数据包的通用格式见图2。

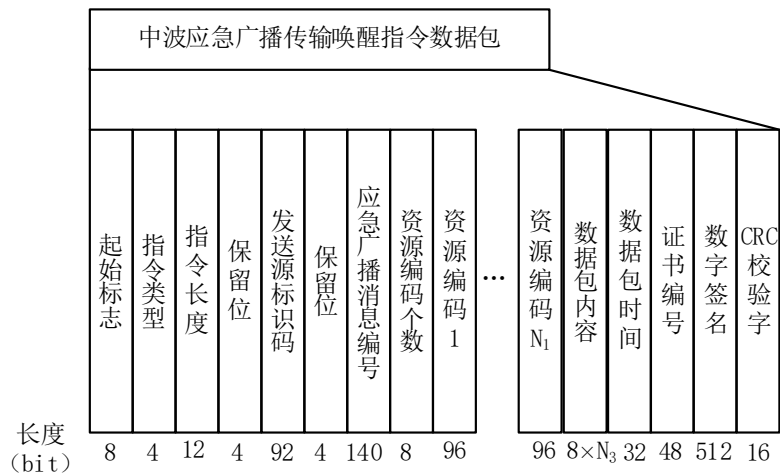


图2 中波应急广播传输唤醒指令数据包通用格式

数据包通用格式中各字段定义应与表1相符合。

表1 数据包语法定义

序号	语法	长度 bit	编码规则
1	起始标志	8	取值为 0x69
2	指令类型	4	取值范围为 0x0~0xF: 0x0: 保留; 0x1: 开播; 0x2: 停播; 0x3: 更换默认锁定频点; 0x4: 证书授权指令; 0x5: 保留; 0x6: 应急演练; 0x7: 资源编码设置; 0x8: 校时指令; 0x9: 扩展数据传输; 0xA: 快速处理机制传输指令; 0xB~0xF: 保留
3	指令长度	12	表示指令的总字节数, 包括从起始标志 (含) 开始到数字签名 (含) 的字节数, 不包括 CRC 校验字。指令长度为 108+12×N <sub>1</sub> +N <sub>3</sub> , N <sub>1</sub> 为资源编码个数, N <sub>3</sub> 为数据包内容字节数
4	保留位	4	保留, 取值为 0x0F
5	发送源标识码	92	用于标识播发本次应急广播消息的应急广播平台, 由 23 个数字码组成, 数字按 4 位 BCD 编码。数字码定义应符合 GY/T 386—2023 中的规定

表 1（续）

序号	语法	长度 bit	编码规则
6	保留位	4	保留，取值为 0xF
7	应急广播消息编号	140	表示本次应急广播消息编号，编码规则应符合 GY/T 385—2023 中的规定
8	资源编码个数	8	$N_1$ ，取值范围为 0x01~0x08，表示需要响应本条指令的资源编码个数，即后一个字段“资源编码”的重复次数
9	资源编码	$96 \times N_1$	资源编码，长度为 96 位；包含了需要响应本条指令的目标终端所处区域的行政区域及资源类型等数字码，最高 4 位用 0xF 填充，其余每个数字按 4 位 BCD 编码，共 23 个数字，应符合 GY/T 386—2023 中的地区编码规则规定
10	数据包内容	$8 \times N_3$	应急广播数据包内容，字节数为 $N_3$
11	数据包时间	32	32 位字段，表示该应急广播消息数据包的时间，格式为 uimbf 顺序的 UTC 时间
12	证书编号	48	由 12 个十进制数字组成，每个数字按 4 位 BCD 编码，共 48 位
13	数字签名	512	对所有字段内容（从起始标志开始到本字段之前）的数字签名，应符合 GY/T 389—2023 中数字签名的规定
14	CRC 校验字	16	对所有应急广播数据包数据进行 CRC16 循环冗余校验，校验数据从起始标志开始计算，校验算法采用 CCITT-FALSE 算法，校验字生成多项式为 $x^{16}+x^{12}+x^5+1$ ，初始值为 0xFFFF

## 7.2 应急广播数据安全保护机制

中波应急广播传输唤醒指令在中波广播中传输时，应具备防插播、防重放、防篡改攻击等安全措施和安全防护能力，应采用数字签名技术实现对应急广播消息的安全保护。安全保护机制应符合 GY/T 389—2023 中的规定。

## 7.3 中波应急广播传输指令定义

### 7.3.1 指令类型分类

中波应急广播传输唤醒指令类型由数据包中的指令类型字段定义，其定义应与表 2 相符合。

表 2 指令类型定义

序号	十六进制值	字段定义说明
1	0x0	保留
2	0x1	开播
3	0x2	停播
4	0x3	更换默认锁定频点
5	0x4	证书授权指令
6	0x5	保留
7	0x6	应急演练

表2（续）

序号	十六进制值	字段定义说明
8	0x7	资源编码设置
9	0x8	校时指令
10	0x9	扩展数据传输
11	0xA	快速处理机制传输指令
12	0xB~0xF	保留

### 7.3.2 开播指令

指令类型：0x1。

数据包内容长度：10字节。

开播指令数据包内容定义应与表3相符合。

表3 开播指令数据包内容定义

序号	语法	长度 bit	编码规则
1	播出时长	8	终端唤醒后需要播出的时间长度，单位为分钟（min），取值范围为0x00~0xFF；取值为0x00和0xFF（255）时，表示播出时长不适用，则按照终端设置的缺省播出时长播出，缺省播出时长为60min
2	事件级别	4	0x0：缺省（未知或白色）； 0x1：1级（特别重大）； 0x2：2级（重大）； 0x3：3级（较大）； 0x4：4级（一般）； 0x5~0xF：保留
3	事件类型	40	由5个ASCII字符组成，见《国家应急平台体系信息资源分类与编码规范》
4	保留字段	28	值为0xFFFFFFFF

### 7.3.3 停播指令

指令类型：0x2。

数据包内容长度：0字节。

### 7.3.4 更换默认锁定频点指令

本指令用于通知指定区域的中波应急广播接收终端改变默认的锁定频点。

数据包类型：0x3。

数据包内容长度：4字节。

更换默认锁定频点指令数据包内容定义应与表4相符合。

表4 更换默认锁定频点指令数据包内容定义

序号	语法	长度 bit	编码规则
1	频点类型	8	取值范围为 0x00~0x0F，表示切换的目标类型。 0x00：不切换； 0x01：切换中波默认锁定频点； 0x02~0x0F：保留
2	频点值	24	表示更换后的默认锁定频率值，采用 3 字节 BCD 码表示 6 位数频率值，单位为千赫兹（kHz）。更换成功后，接收设备默认锁定该频率

### 7.3.5 证书授权指令

数据包类型：0x4。

数据包内容长度：可变。

证书授权指令的资源编码个数为0，无后续资源编码数据。

证书授权指令数据包内容定义应与表5相符合，证书更新数据包内容定义应与表6相符合。

表5 证书授权指令数据包内容定义

序号	语法	长度 bit	编码规则
1	证书授权数据类型	8	取值为 0x01 时，表示证书信任列表授权
2	应急广播数字证书授权列表数据长度	16	N，每个应急广播数字证书授权列表数据的长度（以字节为单位计数）
3	应急广播数字证书授权列表数据	N×8	中波应急广播数字证书授权列表数据应符合GY/T 389—2023中的规定

表6 证书更新数据包内容定义

序号	语法	长度 bit	编码规则
1	证书授权数据类型	8	取值为 0x02 时，表示证书更新
2	证书个数	8	表示要更新证书的数量
3	证书数据长度	8	N，每个数字证书的长度（以字节为单位计数）
4	证书数据	N×8	中波应急广播证书更新数据应符合GY/T 389—2023中的规定

### 7.3.6 应急演练指令

数据包类型：0x6。

数据包内容长度：0.5字节。

应急演练指令数据包内容定义应与表7相符合。

表7 应急演练指令数据包内容定义

序号	语法	长度 bit	编码规则
1	应急演练类型	4	0x0: 保留; 0x1: 系统演练; 0x2: 模拟演练; 0x3: 实际演练; 0x4~0xF: 保留
2	应急演练操作指令	4	0x0: 保留; 0x1: 播出终端设备内预存音频; 0x2: 播出当前频点节目; 0x3: 回传状态参数; 0x4: 停播; 0x5~0xF: 保留

7.3.7 资源编码设置指令

数据包类型：0x7。

数据包内容长度：可变。

资源编码设置指令数据包内容定义应与表8相符合。

表8 资源编码设置指令数据包内容定义

序号	语法	长度 bit	编码规则
1	物理地址长度	8	N, 每个物理编码的长度 (以字节为单位计数)
2	物理编码	8×N	被设置的设备物理编码
3	保留位	4	填充 0xF
4	资源编码	92	要设置的资源编码, 每个数字按 4 位 BCD 编码, 共 23 个数字, 应符合 GY/T 386—2023 中的地区编码规则规定

7.3.8 校时指令

数据包类型：0x8。

数据包内容长度：7字节。

校时指令数据包内容定义应与表9相符合。

表9 校时指令数据包内容定义

序号	语法	长度 bit	编码规则
1	年	16	16 进制表示, 如 2014 年: 0x7de
2	月	8	16 进制表示
3	日	8	16 进制表示



表9（续）

序号	语法	长度 bit	编码规则
4	时	8	16进制表示
5	分	8	16进制表示
6	秒	8	16进制表示

### 7.3.9 扩展数据传输指令

数据包类型：0x9。

数据包内容长度：可变。

扩展数据传输指令数据包内容定义应与表10符合，其中多语种数据包内容定义应与表11相符合。

表10 扩展数据传输指令数据包内容定义

序号	语法	长度 bit	编码规则
1	播出时长	8	表示终端唤醒后需要播出的时间长度，单位为分钟（min），取值范围为0x00~0xFE，取值为0x00和0xFF时，表示播出时长不适用
2	事件级别	4	0x0：缺省（未知或白色）； 0x1：1级（特别重大）； 0x2：2级（重大）； 0x3：3级（较大）； 0x4：4级（一般）； 0x5~0xF：保留
3	事件类型	40	由5个ASCII字符组成，见《国家应急平台体系信息资源分类与编码规范》
4	扩展数据类型	4	0x0：保留； 0x1：多语种文本内容； 0x2~0xF：保留
5	扩展数据长度	12	N，每个扩展数据的长度（以字节为单位计数）
6	扩展数据	8×N	扩展数据

表11 多语种数据包内容定义

序号	语法	长度 bit	编码规则
1	扩展数据类型	4	取值为0x1
2	扩展数据长度	12	每个扩展数据的长度（以字节为单位计数）
3	保留	4	填充0xF
4	多语种内容数据类型	4	0x0：保留； 0x1：应急事件文本； 0x2：日常宣传文本； 0x3：应急测试文本； 0x4~0xF：保留

表 11 (续)

序号	语法	长度 bit	编码规则
5	语言代码	24	24 位字段，表示当前应急广播内容的语种代码，该代码应符合 GB/T 4880.2—2000 中 3 字母语种代码要求，每个字符按编码为 8 位，应符合 GB/T 15273.1—1994 的规定。 例如：汉语的 3 字符代码为“zho”，经编码后相应的语种代码为“0111 1010 0110 1000 0110 1111”
6	编码字符集	4	0x0：应符合 GB/T 2312—1980 的规定； 0x1：应符合 GB 18030—2022 的规定（可选）； 0x2：应符合 GB/T 13000—2010 的规定（可选）； 0x3：应符合 GB/T 21669—2008 的规定（可选）； 0x4：应符合 GB 16959—1997 的规定（可选）； 0x5~0xF：保留
7	多语种内容数据长度	12	N，多语种内容数据的长度（以字节为单位计数）
8	多语种内容数据	N×8	多语种内容数据

### 7.3.10 快速处理机制传输指令

数据包类型：0xA。

数据包内容长度：可变。

快速处理机制传输指令数据包内容定义应与表12相符合。

表12 快速处理机制传输指令数据包内容定义

序号	语法	长度 bit	编码规则
1	reserved	4	保留
2	quick_Instructions_length	12	快速处理机制数据长度N，16位字段，整数型
3	quick_Instructions_data	8×N	快速处理机制数据

### 7.4 应急广播数据包封装方式

当一个应急广播数据被封装到应急广播数据帧中，一帧的长度为160字节（1280比特位），当应急广播数据包长度不足160字节时，使用一个应急广播数据帧传输，剩余帧数据用填充字填充。当一个应急广播数据包长度超过160字节时，被分到两个或多个数据帧中传输。应急广播数据包封装方式定义应与图3相符合。

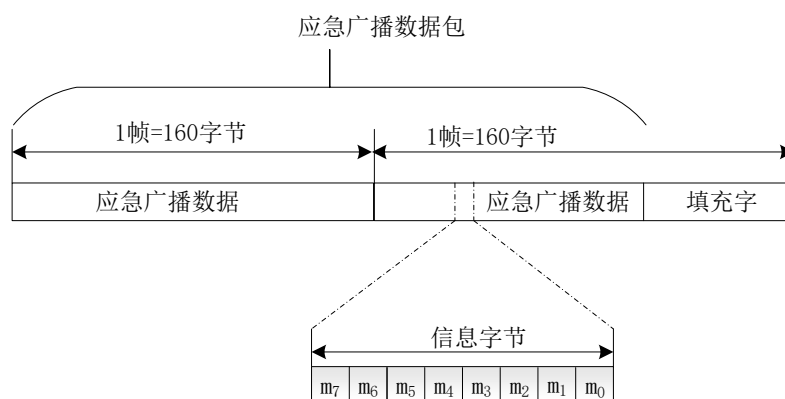


图3 应急广播数据包封装方式定义

当数据包的长度不足160字节时，以00作为填充字填充。

### 7.5 基带编码数据帧格式

应急广播数据帧经过LDPC编码后由1280bit（160字节）扩展为2560bit（320字节），再加上64bit的帧头和2bit的帧尾构成基带编码数据帧，应与图4相符合。

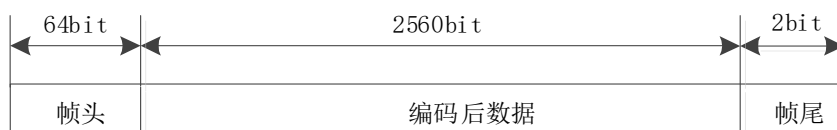


图4 基带编码数据帧格式定义

帧头：64bit PN序列，数值为 71 B4 89 95 03 EF 3A C3。

帧尾：二进制11。

### 7.6 信道编码和调制

#### 7.6.1 信息处理流程

首先对应急广播数据帧进行FEC编码，本文件采用的FEC编码方式为LDPC编码，码率为1/2。将编码后的数据封装成编码帧，由三部分数据构成一帧：64bit PN序列作为帧头，加上FEC编码后的数据，最后加上2bit作为帧尾。封装后，进行MSK调制，调制后的信号加上前导频和后导频，送至中波发射机进行AM调制并发射，流程应与图5相符合。

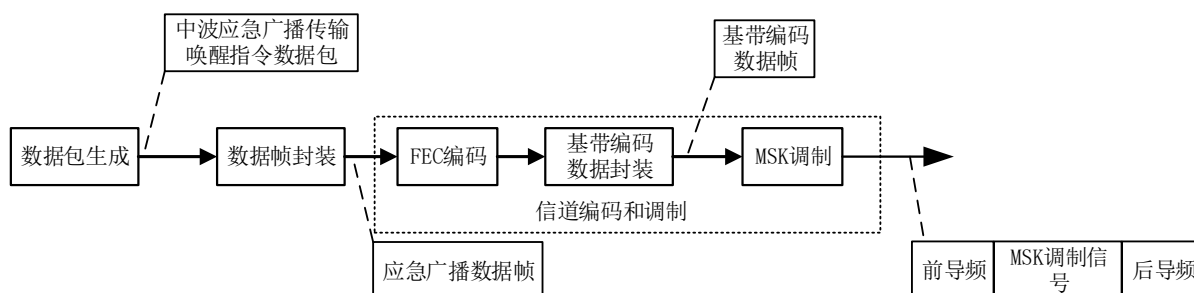


图5 数据编码和调制流程

### 7.6.2 位传送顺序

每个字节首先传送最高比特位，次高比特位，最后依次传送最低比特位。

### 7.6.3 前向纠错编码（FEC）

#### 7.6.3.1 编码方式

本文件采用的FEC编码方式为LDPC编码，1/2码率。

#### 7.6.3.2 码型结构

校验矩阵 $H$ 为 $1280 \times 2560$ 的二进制矩阵， $H$ 的非0元素为1，共有9216位1，校验矩阵 $H$ 应符合附录A的规定。

校验矩阵 $H = (H_1, H_2)$ ， $H_1$ 与 $H_2$ 均为 $1280 \times 1280$ 的方阵，生成矩阵 $G = (H_2^{-1}H_1)$ ，校验矩阵 $H$ 应符合附录B的规定。

#### 7.6.3.3 LDPC 编码处理

LDPC编码的输入信息为应急广播数据帧，1280位信息 $m$ 经LDPC编码后得2560位的码字。

$$c = (m, s)$$

式中： $s^T = Gm^T$ ， $G$ 为生成矩阵。

### 7.6.4 信号产生与调制

#### 7.6.4.1 调制方式

信号调制方式采用MSK调制。

#### 7.6.4.2 符号映射

符号“0”映射为下偏频 $f_1=1\text{kHz}$ ，符号“1”映射为上偏频 $f_2=3\text{kHz}$ 。

#### 7.6.4.3 MSK 调制

采用中心频率 $f_c=2\text{kHz}$ ，频偏 $\pm 1\text{kHz}$ ，码率为 $4\text{kbps}$ 的MSK调制方式。

#### 7.6.4.4 信号产生

信号由前导频、MSK调制信号和1/5幅度的后导频构成。

前导频：频率 $f_c$ ，时长为8个正弦波周期。

MSK调制信号：中心频率为 $f_c$ ，频偏为 $\pm 1\text{kHz}$ 。

后导频：频率为 $f_c$ ，幅度为前导频幅度的1/5，时长为8个正弦波周期。

信号幅度取值为日常中波播出音频信号幅度的80%~100%之间。

信号产生过程中应保持各部分波形和相位连续。

## 8 中波发射台站应急广播前端技术要求

## 8.1 总体要求

中波发射台站应急广播前端应具备对应急广播消息的接收、解析、封装、调制和播发功能，对应急广播消息开播/停播进行管理，向应急广播平台反馈应急广播消息处理响应结果，处理流程示例见附录C。

## 8.2 系统时间校时

应急广播适配器应具备与GPS/北斗时钟自动校时功能。

## 8.3 应急广播前端对应急广播消息的处理要求

### 8.3.1 应急广播消息接收

中波应急广播前端应部署应急广播适配器并进行相应改造，按照GY/T 384—2023接收应急广播平台下发的应急广播消息，对该消息进行安全校验和时间有效性检验，对合法的、处于有效播发时间内的应急广播消息予以接收，对于不合法的或已超过有效播发时间的应急广播消息做丢弃处理，并对应急广播消息生命周期进行管理，接收处理示例见附录C。

### 8.3.2 应急广播消息解析

应急广播适配器应能够按照GY/T 385—2023解析应急广播平台发送的应急广播消息，解析处理应急广播消息中的应急广播内容，对处于有效播发时间内的应急广播消息按照优先级顺序处理，并将接收处理结果反馈至应急广播平台。

### 8.3.3 应急广播消息封装

应急广播适配器从优先顺序队列里提取需要播发的应急广播消息，按照第7章中波应急广播传输唤醒指令的要求进行封装处理。产生一个中波应急广播开播指令，在该开播指令中加入需播发应急广播消息的编号、事件级别等信息，最后对中波应急广播开播指令进行签名保护并生成MSK信令。

当应急广播消息到达结束时间时，应急广播适配器生成一个中波应急广播停播指令，并对停播指令进行签名保护。

### 8.3.4 应急广播消息播发

应急广播适配器进行应急广播消息播发时，输出控制指令到音频切换器，将音频切换器输入音源切换到应急广播适配器输出的音频，应急广播音频通过音频切换器送入中波调制发射系统，通过指定频点发射。

### 8.3.5 应急广播调制发射

中波应急广播前端应具备播出应急广播音频信号和发出唤醒指令功能。

应急广播适配器将封装好的中波应急广播传输唤醒指令，按照第7章中基带和信道编码要求，生成中波应急广播MSK信令，和应急广播音频一起送入中波调制器进行调制，并通过中波发射机指定频点发射，唤醒中波应急广播接收终端进行播放。

## 8.4 应急广播并发处理

应急广播的并发处理要求如下：

- a) 应能接收和处理两个及以上并发的应急广播消息，但在同一区域的同一时刻，应仅播发优先级最高、开始时间已到且持续时间未到期的一条应急广播消息；

- b) 当前应急广播 A 正在播发时，收到一条级别更高的应急广播 B，且 B 的播发时段与 A 的播发时段存在重叠，应在 B 的开始时间到达时停止播发 A，应急广播 A 等待，同时开始播发 B，当 B 播发结束后，应继续播发 A；
- c) 当前应急广播 A 正在播发时，收到一条级别相同或较低的应急广播 B，且 B 的播发时段与 A 的播发时段存在重叠，应继续播发 A，应急广播 B 等待，当 A 播发结束时，应开始播发 B。

## 9 中波应急广播接收终端对应急广播消息的处理要求

中波应急广播接收终端对应急广播消息的处理要求如下。

- a) 应急广播开播响应：中波应急广播接收终端应锁定在指定频点，实时监听接收唤醒指令，进行指令安全性验证、资源码匹配后，根据指令要求立即播出对应的应急广播音频节目，同时记录开播指令中指定的播出时长，并实时计算已播时长。
- b) 应急广播停播响应：处于开播的中波应急广播接收终端接收到应急广播停播指令后，应立即停止播出，恢复锁定在预设频点继续等待下一次开播指令。当已播时长大于播出时长时，也应立即停止播出，恢复锁定在预设频点继续等待下一次开播指令。

中波发射台站应急广播消息接收系统和接收终端对应急广播消息处理示例见附录D。

附 录 A  
(规范性)  
LDPC 码校验矩阵 H

校验矩阵  $H$  是一个  $1280 \times 2560$  的二进制矩阵,  $H$  的非零元为 1, 共有 9216 位非零元 1。校验矩阵  $H$  中非 0 元素 (即 1 元素) 的具体行列位置描述如下。

(127, 1) (352, 1) (567, 1) (927, 1) (1203, 1) (128, 2)  
 (321, 2) (568, 2) (928, 2) (1204, 2) (97, 3) (322, 3)  
 (569, 3) (897, 3) (1205, 3) (98, 4) (323, 4) (570, 4)  
 (898, 4) (1206, 4) (99, 5) (324, 5) (571, 5) (899, 5)  
 (1207, 5) (100, 6) (325, 6) (572, 6) (900, 6) (1208, 6)  
 (101, 7) (326, 7) (573, 7) (901, 7) (1209, 7) (102, 8)  
 (327, 8) (574, 8) (902, 8) (1210, 8) (103, 9) (328, 9)  
 (575, 9) (903, 9) (1211, 9) (104, 10) (329, 10) (576, 10)  
 (904, 10) (1212, 10) (105, 11) (330, 11) (545, 11) (905, 11)  
 (1213, 11) (106, 12) (331, 12) (546, 12) (906, 12) (1214, 12)  
 (107, 13) (332, 13) (547, 13) (907, 13) (1215, 13) (108, 14)  
 (333, 14) (548, 14) (908, 14) (1216, 14) (109, 15) (334, 15)  
 (549, 15) (909, 15) (1185, 15) (110, 16) (335, 16) (550, 16)  
 (910, 16) (1186, 16) (111, 17) (336, 17) (551, 17) (911, 17)  
 (1187, 17) (112, 18) (337, 18) (552, 18) (912, 18) (1188, 18)  
 (113, 19) (338, 19) (553, 19) (913, 19) (1189, 19) (114, 20)  
 (339, 20) (554, 20) (914, 20) (1190, 20) (115, 21) (340, 21)  
 (555, 21) (915, 21) (1191, 21) (116, 22) (341, 22) (556, 22)  
 (916, 22) (1192, 22) (117, 23) (342, 23) (557, 23) (917, 23)  
 (1193, 23) (118, 24) (343, 24) (558, 24) (918, 24) (1194, 24)  
 (119, 25) (344, 25) (559, 25) (919, 25) (1195, 25) (120, 26)  
 (345, 26) (560, 26) (920, 26) (1196, 26) (121, 27) (346, 27)  
 (561, 27) (921, 27) (1197, 27) (122, 28) (347, 28) (562, 28)  
 (922, 28) (1198, 28) (123, 29) (348, 29) (563, 29) (923, 29)  
 (1199, 29) (124, 30) (349, 30) (564, 30) (924, 30) (1200, 30)  
 (125, 31) (350, 31) (565, 31) (925, 31) (1201, 31) (126, 32)  
 (351, 32) (566, 32) (926, 32) (1202, 32) (159, 33) (384, 33)  
 (599, 33) (959, 33) (1235, 33) (160, 34) (353, 34) (600, 34)  
 (960, 34) (1236, 34) (129, 35) (354, 35) (601, 35) (929, 35)  
 (1237, 35) (130, 36) (355, 36) (602, 36) (930, 36) (1238, 36)  
 (131, 37) (356, 37) (603, 37) (931, 37) (1239, 37) (132, 38)  
 (357, 38) (604, 38) (932, 38) (1240, 38) (133, 39) (358, 39)  
 (605, 39) (933, 39) (1241, 39) (134, 40) (359, 40) (606, 40)  
 (934, 40) (1242, 40) (135, 41) (360, 41) (607, 41) (935, 41)  
 (1243, 41) (136, 42) (361, 42) (608, 42) (936, 42) (1244, 42)

(137, 43) (362, 43) (577, 43) (937, 43) (1245, 43) (138, 44)  
(363, 44) (578, 44) (938, 44) (1246, 44) (139, 45) (364, 45)  
(579, 45) (939, 45) (1247, 45) (140, 46) (365, 46) (580, 46)  
(940, 46) (1248, 46) (141, 47) (366, 47) (581, 47) (941, 47)  
(1217, 47) (142, 48) (367, 48) (582, 48) (942, 48) (1218, 48)  
(143, 49) (368, 49) (583, 49) (943, 49) (1219, 49) (144, 50)  
(369, 50) (584, 50) (944, 50) (1220, 50) (145, 51) (370, 51)  
(585, 51) (945, 51) (1221, 51) (146, 52) (371, 52) (586, 52)  
(946, 52) (1222, 52) (147, 53) (372, 53) (587, 53) (947, 53)  
(1223, 53) (148, 54) (373, 54) (588, 54) (948, 54) (1224, 54)  
(149, 55) (374, 55) (589, 55) (949, 55) (1225, 55) (150, 56)  
(375, 56) (590, 56) (950, 56) (1226, 56) (151, 57) (376, 57)  
(591, 57) (951, 57) (1227, 57) (152, 58) (377, 58) (592, 58)  
(952, 58) (1228, 58) (153, 59) (378, 59) (593, 59) (953, 59)  
(1229, 59) (154, 60) (379, 60) (594, 60) (954, 60) (1230, 60)  
(155, 61) (380, 61) (595, 61) (955, 61) (1231, 61) (156, 62)  
(381, 62) (596, 62) (956, 62) (1232, 62) (157, 63) (382, 63)  
(597, 63) (957, 63) (1233, 63) (158, 64) (383, 64) (598, 64)  
(958, 64) (1234, 64) (191, 65) (416, 65) (631, 65) (991, 65)  
(1267, 65) (192, 66) (385, 66) (632, 66) (992, 66) (1268, 66)  
(161, 67) (386, 67) (633, 67) (961, 67) (1269, 67) (162, 68)  
(387, 68) (634, 68) (962, 68) (1270, 68) (163, 69) (388, 69)  
(635, 69) (963, 69) (1271, 69) (164, 70) (389, 70) (636, 70)  
(964, 70) (1272, 70) (165, 71) (390, 71) (637, 71) (965, 71)  
(1273, 71) (166, 72) (391, 72) (638, 72) (966, 72) (1274, 72)  
(167, 73) (392, 73) (639, 73) (967, 73) (1275, 73) (168, 74)  
(393, 74) (640, 74) (968, 74) (1276, 74) (169, 75) (394, 75)  
(609, 75) (969, 75) (1277, 75) (170, 76) (395, 76) (610, 76)  
(970, 76) (1278, 76) (171, 77) (396, 77) (611, 77) (971, 77)  
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(1016, 2552) (1272, 2552) (1017, 2553) (1273, 2553) (1018, 2554) (1274, 2554)  
(1019, 2555) (1275, 2555) (1020, 2556) (1276, 2556) (1021, 2557) (1277, 2557)  
(1022, 2558) (1278, 2558) (1023, 2559) (1279, 2559) (1024, 2560) (1280, 2560)

**附 录 B**  
**(规范性)**  
**LDPC 码生成矩阵 G**

生成矩阵G的每行有1280位，16进制表示为160字节，分成40段，每段4字节。G按 $32 \times 32$ 的小方块分块的第*i*行第*j*块为 $32 \times 32$ 的右循环矩阵 $G_{ij}$ ，右循环矩阵 $G_{ij}$ 内的每一行都是上一行的向右循环移位一位，此方阵的第一行是此方阵的最后一行的向右循环移位一位。记 $G_{i,j}$ 的第一行的16进制表示为 $G[i][j]$ ，其中 $i=1, 2, \dots, 40$ ； $j=1, 2, \dots, 40$ 。定义 $G[i]$ 为： $G[i][1], G[i][2], \dots, G[i][40]$ 。 $G[i]$ 为G的第 $32 \times i - 31$ 行的40小段的十六进制表示， $i=1, 2, \dots, 40$ 。

排列格式为：

$G[i]$ ：

$G[i][1]$   $G[i][2]$   $G[i][3]$   $G[i][4]$   $G[i][5]$   $G[i][6]$   $G[i][7]$   $G[i][8]$   
 $G[i][9]$   $G[i][10]$   $G[i][11]$   $G[i][12]$   $G[i][13]$   $G[i][14]$   $G[i][15]$   $G[i][16]$   
 $G[i][17]$   $G[i][18]$   $G[i][19]$   $G[i][20]$   $G[i][21]$   $G[i][22]$   $G[i][23]$   $G[i][24]$   
 $G[i][25]$   $G[i][26]$   $G[i][27]$   $G[i][28]$   $G[i][29]$   $G[i][30]$   $G[i][31]$   $G[i][32]$   
 $G[i][33]$   $G[i][34]$   $G[i][35]$   $G[i][36]$   $G[i][37]$   $G[i][38]$   $G[i][39]$   $G[i][40]$

$G[1]$ ：

9B5ADB6D ADAF6DB6 36F5B6DB 9B5EDB6D EDAB6DB6 36F5B6DB 5B5EDB6D 6DEB6DB6  
 0D81B6DB D6C0DB6D DB416DB6 0D81B6DB D6C0DB6D 5B416DB6 8D81B6DB 9682DB6D  
 76DB6DBB 1B6DB6D5 6DB6DB6E 76DB6DBB 1B6DB6DD 6DB6DB76 36DB6DAB DB6DB6DD  
 6D81B6E1 B6C2DB31 DB436DD0 6D81B6E1 B6C2DB31 DB436DD2 6D81B6E3 B682DB21  
 DD85B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB33 B34B6DDD DD8DB6E6 6686DB3B

$G[2]$ ：

36F5B6DB 9B5ADB6D ADAF6DB6 36F5B6DB 9B5EDB6D EDAB6DB6 36F5B6DB 5B5EDB6D  
 CB416DB6 0D81B6DB D6C0DB6D DB416DB6 0D81B6DB D6C0DB6D 5B416DB6 8D81B6DB  
 EDB6DB6E 76DB6DBB 1B6DB6D5 6DB6DB6E 76DB6DBB 1B6DB6DD 6DB6DB76 36DB6DAB  
 DB416D90 6D81B6E1 B6C2DB31 DB436DD0 6D81B6E1 B6C2DB31 DB436DD2 6D81B6E3  
 B3436D9D DD85B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB33 B34B6DDD DD8DB6E6

$G[3]$ ：

ADAF6DB6 36F5B6DB 9B5ADB6D ADAF6DB6 36F5B6DB 9B5EDB6D EDAB6DB6 36F5B6DB  
 C6C0DB6D CB416DB6 0D81B6DB D6C0DB6D DB416DB6 0D81B6DB D6C0DB6D 5B416DB6  
 9B6DB6D5 EDB6DB6E 76DB6DBB 1B6DB6D5 6DB6DB6E 76DB6DBB 1B6DB6DD 6DB6DB76  
 B6C0DB71 DB416D90 6D81B6E1 B6C2DB31 DB436DD0 6D81B6E1 B6C2DB31 DB436DD2  
 6EC6DB73 B3436D9D DD85B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB33 B34B6DDD

$G[4]$ ：

9B7ADB6D ADAF6DB6 36F5B6DB 9B5ADB6D ADAF6DB6 36F5B6DB 9B5EDB6D EDAB6DB6  
 2DA0B6DB C6C0DB6D CB416DB6 0D81B6DB D6C0DB6D DB416DB6 0D81B6DB D6C0DB6D

36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DBB	1B6DB6DD
6DA1B6E9	B6C0DB71	DB416D90	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31
D9A5B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB33

G[5]:

76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAF6DB6	36F5B6DB	9B5EDB6D
EB606DB6	2DA0B6DB	C6C0DB6D	CB416DB6	OD81B6DB	D6C0DB6D	DB416DB6	OD81B6DB
8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DBB
DB616D98	6DA1B6E9	B6C0DB71	DB416D90	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1
B7636D99	D9A5B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE

G[6]:

CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAF6DB6	36F5B6DB
86C0DB6D	EB606DB6	2DA0B6DB	C6C0DB6D	CB416DB6	OD81B6DB	D6C0DB6D	DB416DB6
BB6DB6DD	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E
B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB416D90	6D81B6E1	B6C2DB31	DB436DD0
6EC2DB77	B7636D99	D9A5B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D

G[7]:

9B7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAF6DB6
6DA0B6DB	86C0DB6D	EB606DB6	2DA0B6DB	C6C0DB6D	CB416DB6	OD81B6DB	D6C0DB6D
36DB6DB7	BB6DB6DD	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5
6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB416D90	6D81B6E1	B6C2DB31
D9A1B6CE	6EC2DB77	B7636D99	D9A5B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73

G[8]:

56D7B6DB	9B7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D
EB606DB6	6DA0B6DB	86C0DB6D	EB606DB6	2DA0B6DB	C6C0DB6D	CB416DB6	OD81B6DB
8DB6DB6A	36DB6DB7	BB6DB6DD	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB
DB616D98	6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB416D90	6D81B6E1
B7636DB9	D9A1B6CE	6EC2DB77	B7636D99	D9A5B6EE	6EC6DB73	B3436D9D	DD85B6EE

G[9]:

9B5ADB6D	ADAF6DB6	36F5B6DB	9B5EDB6D	EDAB6DB6	76F5B6DB	5B5EDB6D	6DEB6DB6
OD81B6DB	D6C0DB6D	DB416DB6	OD81B6DB	D6C0DB6D	DB416DB6	8D81B6DB	9682DB6D
76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DBB	1B6DB6DD	6DB6DB76	36DB6DAB	5B6DB6DD
6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E3	B682DB21
DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB33	B3436DDD	DD8DB6E6	6686DB3B

G[10]:

36F5B6DB	9B5ADB6D	ADAF6DB6	36F5B6DB	9B5EDB6D	EDAB6DB6	76F5B6DB	5B5EDB6D
CB416DB6	OD81B6DB	D6C0DB6D	DB416DB6	OD81B6DB	D6C0DB6D	DB416DB6	8D81B6DB
ADB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DBB	1B6DB6DD	6DB6DB76	36DB6DAB

DB416D90 6D81B6E1 B6C2DB31 DB436DD0 6D81B6E1 B6C2DB31 DB436DD0 6D81B6E3  
B3436D9D DD85B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB33 B3436DDD DD8DB6E6

G[11]:

ADAF6DB6 36F5B6DB 9B5ADB6D ADAF6DB6 36F5B6DB 9B5EDB6D EDAB6DB6 76F5B6DB  
C6C0DB6D CB416DB6 OD81B6DB D6C0DB6D DB416DB6 OD81B6DB D6C0DB6D DB416DB6  
9B6DB6D5 ADB6DB6E 76DB6DBB 1B6DB6D5 6DB6DB6E 76DB6DBB 1B6DB6DD 6DB6DB76  
B6C0DB71 DB416D90 6D81B6E1 B6C2DB31 DB436DD0 6D81B6E1 B6C2DB31 DB436DD0  
6EC6DB73 B3436D9D DD85B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB33 B3436DDD

G[12]:

BB7ADB6D ADAF6DB6 36F5B6DB 9B5ADB6D ADAF6DB6 36F5B6DB 9B5EDB6D EDAB6DB6  
6DA0B6DB C6C0DB6D CB416DB6 OD81B6DB D6C0DB6D DB416DB6 OD81B6DB D6C0DB6D  
36DB6DBB 9B6DB6D5 ADB6DB6E 76DB6DBB 1B6DB6D5 6DB6DB6E 76DB6DBB 1B6DB6DD  
6DA1B6E8 B6C0DB71 DB416D90 6D81B6E1 B6C2DB31 DB436DD0 6D81B6E1 B6C2DB31  
D9A1B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB33

G[13]:

76D5B6DB BB7ADB6D ADAF6DB6 36F5B6DB 9B5ADB6D ADAF6DB6 36F5B6DB 9B5EDB6D  
EB606DB6 6DA0B6DB C6C0DB6D CB416DB6 OD81B6DB D6C0DB6D DB416DB6 OD81B6DB  
8DB6DB6E 36DB6DBB 9B6DB6D5 ADB6DB6E 76DB6DBB 1B6DB6D5 6DB6DB6E 76DB6DBB  
DB616D98 6DA1B6E8 B6C0DB71 DB416D90 6D81B6E1 B6C2DB31 DB436DD0 6D81B6E1  
B7636D99 D9A1B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB73 B3436D9D DD85B6EE

G[14]:

CDAF6DB6 76D5B6DB BB7ADB6D ADAF6DB6 36F5B6DB 9B5ADB6D ADAF6DB6 36F5B6DB  
86C0DB6D EB606DB6 6DA0B6DB C6C0DB6D CB416DB6 OD81B6DB D6C0DB6D DB416DB6  
BB6DB6DD 8DB6DB6E 36DB6DBB 9B6DB6D5 ADB6DB6E 76DB6DBB 1B6DB6D5 6DB6DB6E  
B6C0DB70 DB616D98 6DA1B6E8 B6C0DB71 DB416D90 6D81B6E1 B6C2DB31 DB436DD0  
6EC2DB77 B7636D99 D9A1B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB73 B3436D9D

G[15]:

9B7ADB6D CDAF6DB6 76D5B6DB BB7ADB6D ADAF6DB6 36F5B6DB 9B5ADB6D ADAF6DB6  
6DA0B6DB 86C0DB6D EB606DB6 6DA0B6DB C6C0DB6D CB416DB6 OD81B6DB D6C0DB6D  
36DB6DB7 BB6DB6DD 8DB6DB6E 36DB6DBB 9B6DB6D5 ADB6DB6E 76DB6DBB 1B6DB6D5  
6DA1B6E8 B6C0DB70 DB616D98 6DA1B6E8 B6C0DB71 DB416D90 6D81B6E1 B6C2DB31  
D9A1B6CE 6EC2DB77 B7636D99 D9A1B6EE 6EC6DB73 B3436D9D DD85B6EE 6EC6DB73

G[16]:

56D7B6DB 9B7ADB6D CDAF6DB6 76D5B6DB BB7ADB6D ADAF6DB6 36F5B6DB 9B5ADB6D  
EB606DB6 6DA0B6DB 86C0DB6D EB606DB6 6DA0B6DB C6C0DB6D CB416DB6 OD81B6DB  
8DB6DB6A 36DB6DB7 BB6DB6DD 8DB6DB6E 36DB6DBB 9B6DB6D5 ADB6DB6E 76DB6DBB  
DB616D98 6DA1B6E8 B6C0DB70 DB616D98 6DA1B6E8 B6C0DB71 DB416D90 6D81B6E1  
B7636DB9 D9A1B6CE 6EC2DB77 B7636D99 D9A1B6EE 6EC6DB73 B3436D9D DD85B6EE

G[17]:

9B5ADB6D	ADAF6DB6	36F5B6DB	9B5EDB6D	EDAB6DB6	76F5B6DB	DB5EDB6D	6DEB6DB6
0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6	8D81B6DB	9680DB6D
76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DBB	1B6DB6DD	6DB6DB76	76DB6DAB	5B6DB6DD
6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E3	B6C2DB21
DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB33	B3436DDD	DD8DB6EE	6686DB3B

G[18]:

36F5B6DB	9B5ADB6D	ADAF6DB6	36F5B6DB	9B5EDB6D	EDAB6DB6	76F5B6DB	DB5EDB6D
CB406DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6	8D81B6DB
ADB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DBB	1B6DB6DD	6DB6DB76	76DB6DAB
DB616D90	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E3
B3436D9D	DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB33	B3436DDD	DD8DB6EE

G[19]:

EDAF6DB6	36F5B6DB	9B5ADB6D	ADAF6DB6	36F5B6DB	9B5EDB6D	EDAB6DB6	76F5B6DB
C6C0DB6D	CB406DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6
BB6DB6D5	ADB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DBB	1B6DB6DD	6DB6DB76
B6C0DB71	DB616D90	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31	DB436DD0
6EC6DB77	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB33	B3436DDD

G[20]:

BB7ADB6D	EDAF6DB6	36F5B6DB	9B5ADB6D	ADAF6DB6	36F5B6DB	9B5EDB6D	EDAB6DB6
6DA0B6DB	C6C0DB6D	CB406DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D
36DB6DBB	BB6DB6D5	ADB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DBB	1B6DB6DD
6DA1B6E8	B6C0DB71	DB616D90	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31
D9A1B6EE	6EC6DB77	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB33

G[21]:

76D5B6DB	BB7ADB6D	EDAF6DB6	36F5B6DB	9B5ADB6D	ADAF6DB6	36F5B6DB	9B5EDB6D
EB606DB6	6DA0B6DB	C6C0DB6D	CB406DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB
8DB6DB6E	36DB6DBB	BB6DB6D5	ADB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DBB
DB616D98	6DA1B6E8	B6C0DB71	DB616D90	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1
B7636D99	D9A1B6EE	6EC6DB77	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE

G[22]:

CDAF6DB6	76D5B6DB	BB7ADB6D	EDAF6DB6	36F5B6DB	9B5ADB6D	ADAF6DB6	36F5B6DB
86C0DB6D	EB606DB6	6DA0B6DB	C6C0DB6D	CB406DB6	0D81B6DB	D6C0DB6D	DB416DB6
BB6DB6DD	8DB6DB6E	36DB6DBB	BB6DB6D5	ADB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E
B6C0DB70	DB616D98	6DA1B6E8	B6C0DB71	DB616D90	6D81B6E1	B6C2DB31	DB436DD0
6EC2DB77	B7636D99	D9A1B6EE	6EC6DB77	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D

G[23]:

9B7ADB6D	CDAF6DB6	76D5B6DB	BB7ADB6D	EDAF6DB6	36F5B6DB	9B5ADB6D	ADAF6DB6
6DA0B6DB	86C0DB6D	EB606DB6	6DA0B6DB	C6C0DB6D	CB406DB6	0D81B6DB	D6C0DB6D
36DB6DB7	BB6DB6DD	8DB6DB6E	36DB6DBB	BB6DB6D5	ADB6DB6E	76DB6DBB	1B6DB6D5
6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E8	B6C0DB71	DB616D90	6D81B6E1	B6C2DB31
D9A1B6CE	6EC2DB77	B7636D99	D9A1B6EE	6EC6DB77	B3436D9D	DD85B6EE	6EC6DB73

G[24]:

56D7B6DB	9B7ADB6D	CDAF6DB6	76D5B6DB	BB7ADB6D	EDAF6DB6	36F5B6DB	9B5ADB6D
EB606DB6	6DA0B6DB	86C0DB6D	EB606DB6	6DA0B6DB	C6C0DB6D	CB406DB6	0D81B6DB
8DB6DB6A	36DB6DB7	BB6DB6DD	8DB6DB6E	36DB6DBB	BB6DB6D5	ADB6DB6E	76DB6DBB
DB616D98	6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E8	B6C0DB71	DB616D90	6D81B6E1
B7636DB9	D9A1B6CE	6EC2DB77	B7636D99	D9A1B6EE	6EC6DB77	B3436D9D	DD85B6EE

G[25]:

ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6	76F5B6DB	9B5EDB6D	EDAB6DB6	36F5B6DB
C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	5B016DB6
9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB66	76DB6DAB	1B6DB6DD	6DB6DB76
B6C0DB71	DB436DD0	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31	DB436DD2
6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436DDD	DD85B6EE	6EC6DB33	B30B6DDD

G[26]:

9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6	76F5B6DB	9B5EDB6D	EDAB6DB6
2D80B6DB	C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D
36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB66	76DB6DAB	1B6DB6DD
6DA1B6E9	B6C0DB71	DB436DD0	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31
D985B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436DDD	DD85B6EE	6EC6DB33

G[27]:

76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6	76F5B6DB	9B5EDB6D
EB606DB6	2D80B6DB	C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB
8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB66	76DB6DAB
DB616D98	6DA1B6E9	B6C0DB71	DB436DD0	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1
B7636D99	D985B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436DDD	DD85B6EE

G[28]:

CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6	76F5B6DB
86C0DB6D	EB606DB6	2D80B6DB	C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6
BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB66
B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB436DD0	6D81B6E1	B6C2DB31	DB436DD0
6EC2DB77	B7636D99	D985B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436DDD

G[29]:

BB7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6
6DA0B6DB	86C0DB6D	EB606DB6	2D80B6DB	C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D
36DB6DB3	BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5
6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB436DD0	6D81B6E1	B6C2DB31
D9A1B6EE	6EC2DB77	B7636D99	D985B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73

G[30]:

56D5B6DB	BB7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D
EB606DB6	6DA0B6DB	86C0DB6D	EB606DB6	2D80B6DB	C6C0DB6D	DB416DB6	0D81B6DB
8DB6DB6A	36DB6DB3	BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB
DB616D98	6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB436DD0	6D81B6E1
B7636DB9	D9A1B6EE	6EC2DB77	B7636D99	D985B6EE	6EC6DB73	B3436D9D	DD85B6EE

G[31]:

CDAD6DB6	56D5B6DB	BB7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB
86C0DB6D	EB606DB6	6DA0B6DB	86C0DB6D	EB606DB6	2D80B6DB	C6C0DB6D	DB416DB6
BB6DB6DD	8DB6DB6A	36DB6DB3	BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E
B6C0DB70	DB616D98	6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB436DD0
6EC2DB77	B7636DB9	D9A1B6EE	6EC2DB77	B7636D99	D985B6EE	6EC6DB73	B3436D9D

G[32]:

9B7ADB6D	CDAD6DB6	56D5B6DB	BB7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6
6DA0B6DB	86C0DB6D	EB606DB6	6DA0B6DB	86C0DB6D	EB606DB6	2D80B6DB	C6C0DB6D
76DB6DB7	BB6DB6DD	8DB6DB6A	36DB6DB3	BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5
6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71
D9A1B6CE	6EC2DB77	B7636DB9	D9A1B6EE	6EC2DB77	B7636D99	D985B6EE	6EC6DB73

G[33]:

ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6	36F5B6DB	9B5EDB6D	EDAB6DB6	36F5B6DB
C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	5B416DB6
9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DAB	1B6DB6DD	6DB6DB76
B6C0DB71	DB416DD0	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31	DB436DD2
6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB33	B30B6DDD

G[34]:

9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6	36F5B6DB	9B5EDB6D	EDAB6DB6
2DA0B6DB	C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D
36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DAB	1B6DB6DD
6DA1B6E9	B6C0DB71	DB416DD0	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1	B6C2DB31
D985B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB33

G[35]:

76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6	36F5B6DB	9B5EDB6D
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EB606DB6	2DA0B6DB	C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB
8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E	76DB6DAB
DB616D98	6DA1B6E9	B6C0DB71	DB416DD0	6D81B6E1	B6C2DB31	DB436DD0	6D81B6E1
B7636D99	D985B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D	DD85B6EE

G[36]:

CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6	36F5B6DB
86C0DB6D	EB606DB6	2DA0B6DB	C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D	DB416DB6
BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5	6DB6DB6E
B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB416DD0	6D81B6E1	B6C2DB31	DB436DD0
6EC2DB77	B7636D99	D985B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73	B3436D9D

G[37]:

9B7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D	ADAB6DB6
6DA0B6DB	86C0DB6D	EB606DB6	2DA0B6DB	C6C0DB6D	DB416DB6	0D81B6DB	D6C0DB6D
36DB6DB7	BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB	1B6DB6D5
6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB416DD0	6D81B6E1	B6C2DB31
D9A1B6CE	6EC2DB77	B7636D99	D985B6EE	6EC6DB73	B3436D9D	DD85B6EE	6EC6DB73

G[38]:

56D5B6DB	9B7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB	9B5ADB6D
EB606DB6	6DA0B6DB	86C0DB6D	EB606DB6	2DA0B6DB	C6C0DB6D	DB416DB6	0D81B6DB
8DB6DB6A	36DB6DB7	BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E	76DB6DBB
DB616D98	6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB416DD0	6D81B6E1
B7636DB9	D9A1B6CE	6EC2DB77	B7636D99	D985B6EE	6EC6DB73	B3436D9D	DD85B6EE

G[39]:

CDAD6DB6	56D5B6DB	9B7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6	36F5B6DB
86C0DB6D	EB606DB6	6DA0B6DB	86C0DB6D	EB606DB6	2DA0B6DB	C6C0DB6D	DB416DB6
BB6DB6DD	8DB6DB6A	36DB6DB7	BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5	EDB6DB6E
B6C0DB70	DB616D98	6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71	DB416DD0
6EC2DB77	B7636DB9	D9A1B6CE	6EC2DB77	B7636D99	D985B6EE	6EC6DB73	B3436D9D

G[40]:

9B7ADB6D	CDAD6DB6	56D5B6DB	9B7ADB6D	CDAF6DB6	76D5B6DB	9B7ADB6D	ADAF6DB6
6DA0B6DB	86C0DB6D	EB606DB6	6DA0B6DB	86C0DB6D	EB606DB6	2DA0B6DB	C6C0DB6D
76DB6DB7	BB6DB6DD	8DB6DB6A	36DB6DB7	BB6DB6D5	8DB6DB6E	36DB6DBB	9B6DB6D5
6DA0B6E8	B6C0DB70	DB616D98	6DA1B6E8	B6C0DB70	DB616D98	6DA1B6E9	B6C0DB71
D9A1B6CE	6EC2DB77	B7636DB9	D9A1B6CE	6EC2DB77	B7636D99	D985B6EE	6EC6DB73

附录 C  
(资料性)

中波发射台站应急广播前端和接收终端对应急广播消息处理示例

图C.1给出了中波发射台站应急广播前端对应急广播消息的处理流程示例。

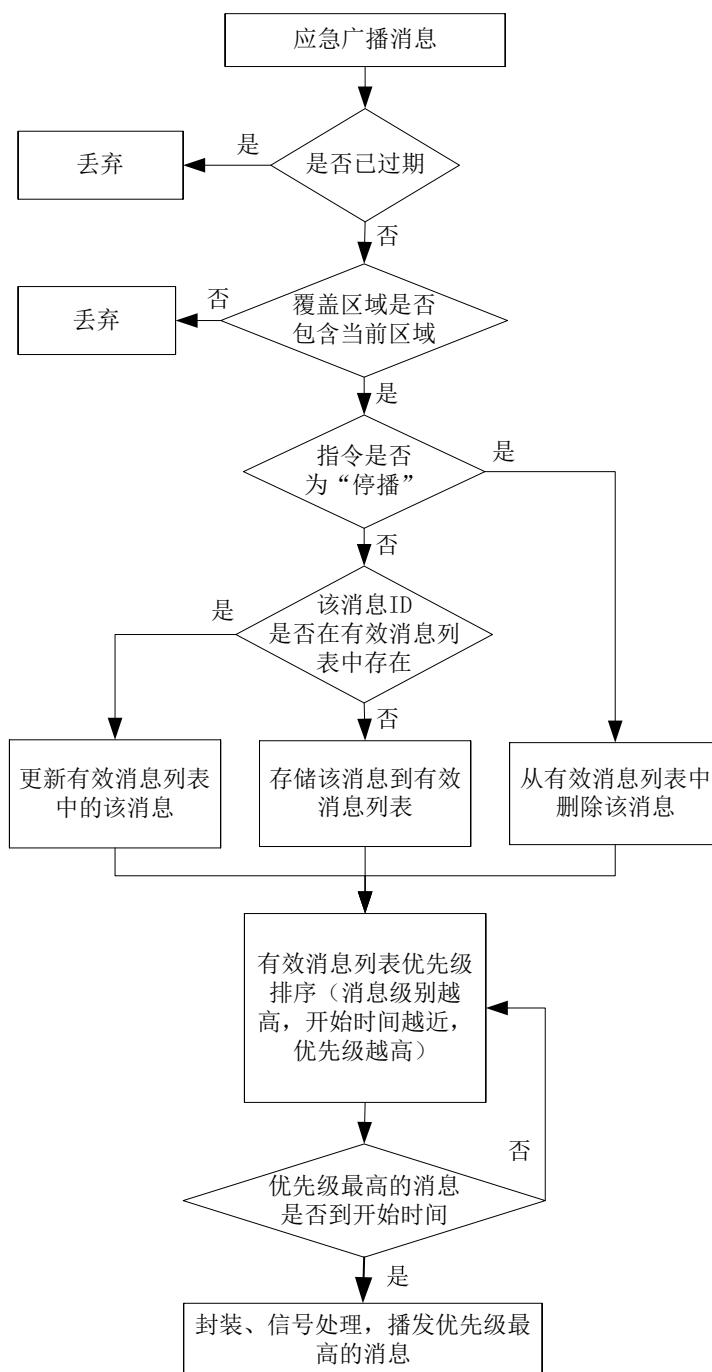


图 C.1 中波发射台站应急广播前端对应急广播消息的处理流程

图C.2给出了中波应急广播接收终端对应急广播消息的处理流程示例。

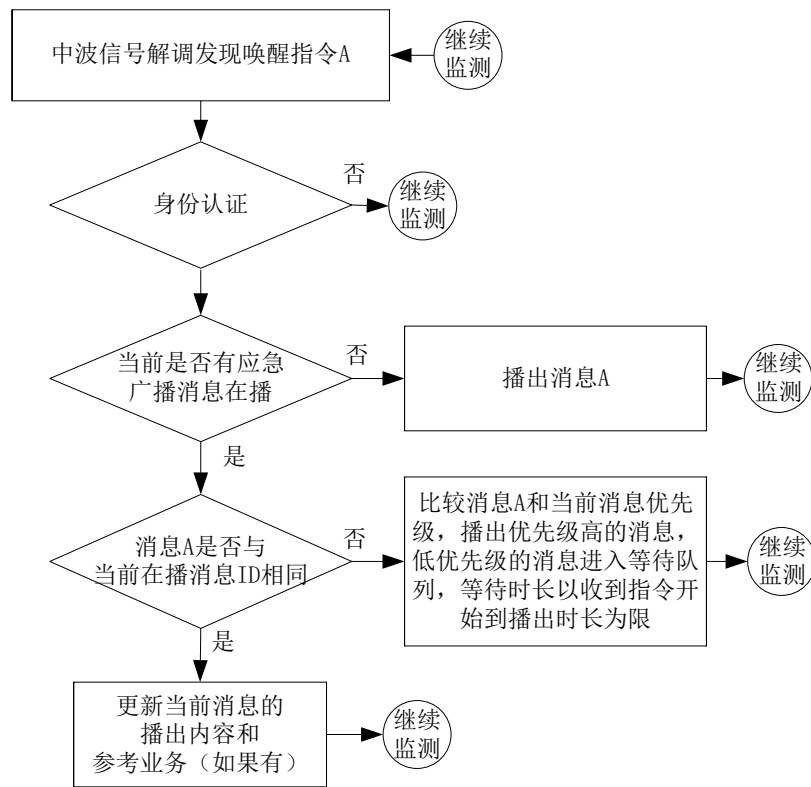


图 C.2 中波应急广播接收终端对应急广播消息的处理流程

附录 D

(资料性)

中波应急广播接收终端对应急广播消息的处理示例

图D.1为中波应急广播接收终端对应急广播消息处理示例，包含信号滤波、MSK解调、PN序列（帧同步头）捕获、位同步校正、数据帧内容采集、FEC解码（LDPC解码）和消息验证等环节。当完成此次指令的接收处理之后系统又会跳到PN序列捕获的环节，等待下一个数据帧的到来。

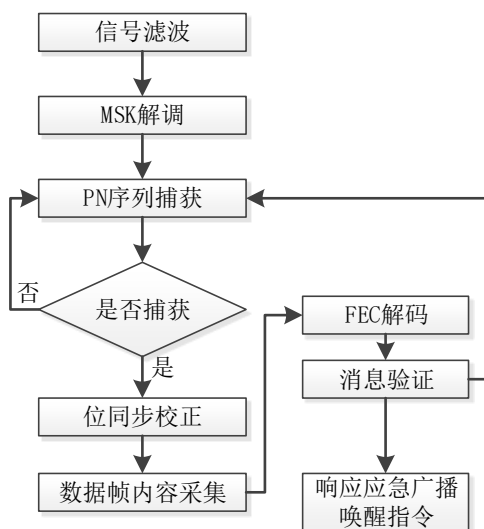


图 D.1 接收装置信号处理流程

### 参 考 文 献

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