



中华人民共和国广播电视行业暂行技术文件

GD/J 084—2018

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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

本技术文件按照GB/T 1.1—2009给出的规则起草。

本技术文件由国家广播电视总局科技司归口。

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本技术文件主要起草人：刘骏、高力、高杨、常江、周兴伟、代明、曹志、周德斌、许帮保、李晓鸣、刘春江、许国法、邹南京、王延辉、宁海斌。

## 引 言

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# 中波调幅广播应急广播技术规范

## 1 范围

本技术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。

本技术文件适用于中波调幅广播应急广播系统相关设备和接收终端的设计、开发、生产、验收、运行和维护。

## 2 规范性引用文件

下列文件对于本文件的应用是必不可少的。凡是注日期的引用文件，仅注日期的版本适用于本文件。凡是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。

- GD/J 080—2018 应急广播系统资源分类及编码规范
- GD/J 081—2018 应急广播安全保护技术规范 数字签名
- GD/J 082—2018 应急广播消息格式规范
- GD/J 083—2018 应急广播平台接口规范
- GD/J 088—2018 县级应急广播系统技术规范

## 3 术语、定义、缩略语和约定

### 3.1 术语和定义

下列术语和定义适用于本文件。

#### 3.1.1

**突发事件** emergency event

突然发生，造成或者可能造成严重社会危害，需要采取应急处置措施予以应对的自然灾害、事故灾难、公共卫生事件和社会安全事件。

#### 3.1.2

**应急广播** emergency broadcasting

一种利用广播电视系统向公众发布应急信息的方式。

#### 3.1.3

**应急信息** emergency information

通过县级以上人民政府及其有关部门、专业机构发布，应急广播系统接收的源信息。内容包括自然灾害、事故灾难、公共卫生和社会安全等各类信息。

#### 3.1.4

##### **应急广播消息** emergency broadcasting message

各级应急广播平台之间,以及应急广播平台到各类应急广播传输覆盖资源和终端之间传递的播发指令等相关数据。应急广播消息包括应急广播信息主体文件、应急广播信息主体签名文件、应急广播节目资源文件、应急广播消息指令文件、应急广播消息指令签名文件。

#### 3.1.5

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

接收、解析、验证应急广播消息,并向广播电视频率频道播出系统和传输覆盖网进行协议转换的设备。

#### 3.1.6

##### **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。

### 3.2 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 世界协调时 (Coordinated Universal Time)

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

### 3.3 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。

## 4 概述

中波调幅广播应急广播系统架构见图1。

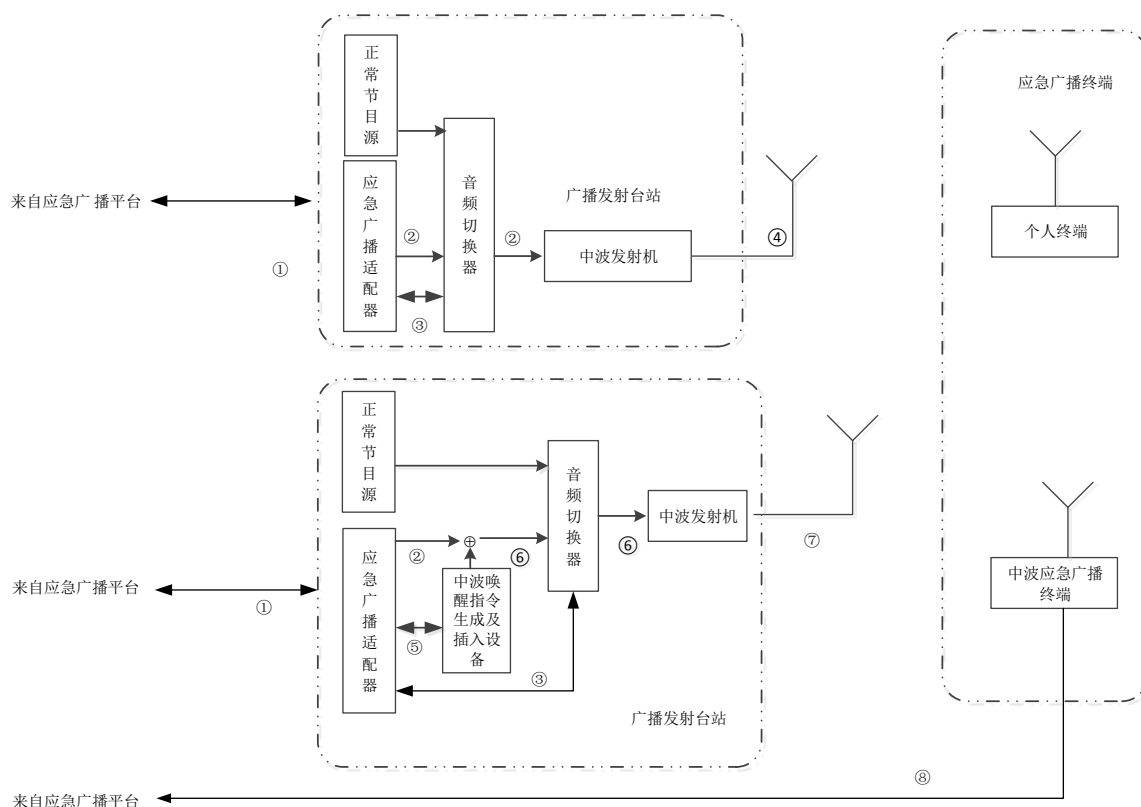


图1 中波调幅广播应急广播系统架构

注：数据信号类型：

- ①自平台的应急广播消息，由GD/J 083—2018定义；
- 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包含唤醒指令的音频节目信号，唤醒指令格式见本标准第5章；
- ⑦包含唤醒指令的音频节目信号的中波射频信号；
- ⑧终端回传协议，见GD/J 088—2018定义。

中波广播发射台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输出应急广播节目信号，正在收听该频率的收音机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唤醒指令后的应急广播节目信号，中波应急广播终端响应唤醒指令，接收并播放应急广播节目。

## 5 中波应急广播传输唤醒指令封装协议

### 5.1 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。

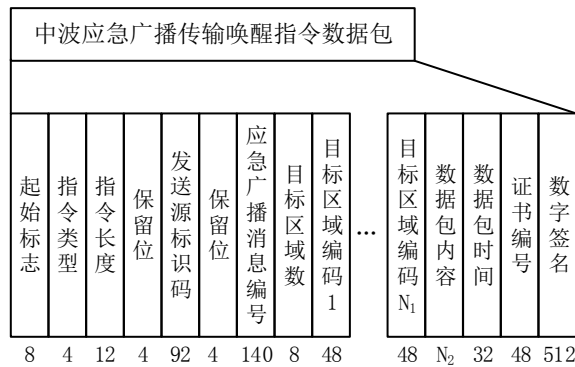


图2 中波应急广播传输唤醒指令数据包通用格式示意图

数据包通用格式中各字段定义如表1所示。

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	0x69
2	指令类型	4	取值范围：0x00~0x0F 0x00：保留 0x01：保留 0x02：开播 0x03：停播 0x04：更换默认锁定频点 0x05：证书授权指令 0x06：证书发布指令 0x07~0x0F：保留
3	指令长度	12	表示指令的总字节数，包括起始标志、指令类型及数据包时间等，不包括填充字、数据包时间、证书编号和数字签名。指令长度为 $22+N_i*7$ ， $N_i$ 为目标区域数，最大取值为 8。
4	保留位	4	保留，取值为 0x0F
5	发送源标识码	92	指示发布本次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。数字码定义见 GD/J 080—2018。
6	保留位	4	保留，取值为 0x0F
7	应急广播消息编号	140	指示本次应急广播消息编号，编码规则见 GD/J 082—2018。
8	目标区域数	8	$N_i$ ，取值范围：1~8，指示需要响应本条指令的目标区域个数，即后一个字段“目标区域编码”的重复次数。
9	目标区域编码	$48 \times N_i$	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数字码，每个数字按 4 位 BCD 编码，共 12 个数字，见 GD/J 080—2018 中的地区编码规则。



表 1 (续)

序号	语法	长度 bit	编码规则
10	数据包内容	$N_2$	见本标准 5.5
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 uimsbf 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	对前述所有字段内容的数字签名，见 GD/J 081—2018。

## 5.2 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，需要具备防插播、防重放、防篡改攻击等安全措施和安全防护能力，采用数字签名技术实现对应急广播消息的安全保护。安全保护机制详见GD/J 081—2018。

## 5.3 中波应急广播传输唤醒指令定义

### 5.3.1 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，其定义如表2所示。

表2 指令类型定义表

序号	十进制值	字段定义说明
1	0	保留
2	1	开播
3	2	停播
4	3	更换默认锁定频点
5	4	证书授权指令
6	5~15	保留

### 5.3.2 开播指令

指令类型（十进制，下同）：01；

数据包内容长度：10字节。

其定义如表3所示。

表3 开播指令数据包内容

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，取值范围 0~255。 取值为 0 事，则按照终端设置的缺省播出时长播出，缺省播出时长为 60 分钟。
2	事件级别	4	0: 缺省 1: 1 级（特别重大） 2: 2 级（重大） 3: 3 级（较大） 4: 4 级（一般） 5~15: 保留
3	事件类型	40	由 5 个 ASCII 字符组成，依照《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	保留

### 5.3.3 停播指令

指令类型：02；

数据包内容长度：0字节；

### 5.3.4 设置默认锁定频点指令

本指令用于通知指定区域的中波应急广播终端改变默认的锁定频点。

数据包类型：03

数据包内容长度：4字节；

其定义如表4所示。

表4 设置默认锁定频点

序号	语法	长度 bit	编码规则
1	频点类型	8	取值范围 0~15，指示切换的目标类型。 0: 不切换 1: 中波 2~15: 保留
2	频点值	24	指示切换目标的内容： 中波：目标频率（单位：kHz） 使用 6 个数字，每个数字采用 4 位 BCD 码表示的频率。

### 5.3.5 证书授权指令

数据包类型：04

数据包内容长度：可变；

设置安全参数指令格式如图3所示：

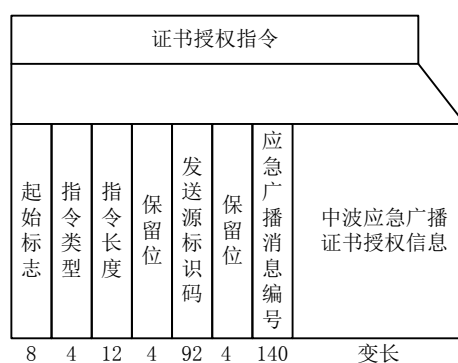


图3 证书授权指令数据包结构图

中波应急广播证书授权信息见GD/J 081—2018。

#### 5.4 应急广播数据帧格式

应急广播数据帧由中波应急广播传输唤醒指令数据包和填充字组成，一帧的长度为160字节（1280比特位）。应急广播数据帧格式见图4。

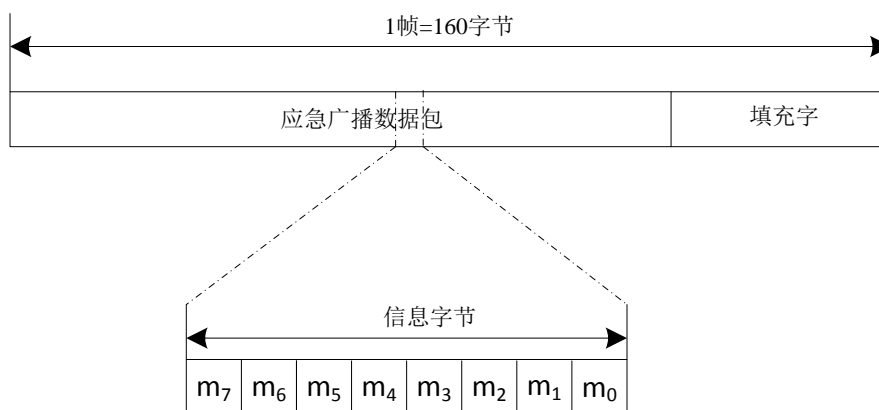


图4 应急广播数据帧格式定义

当数据包的长度不足160字节时，以00作为填充字填充。

#### 5.5 基带编码数据帧格式

应急广播数据帧经过LDPC编码后由1280比特（160字节）扩展为2560比特（320字节），再加上64比特的帧头和2比特的帧尾构成基带编码数据帧，见图5。

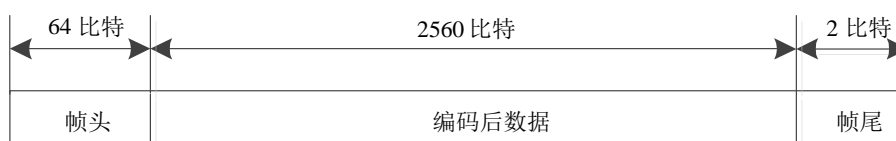


图5 基带编码数据帧格式定义

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

帧尾：二进制11。

## 5.6 信道编码和调制

### 5.6.1 信息处理流程

首先对应急广播数据帧进行FEC编码，本标准采用的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：64比特PN序列作为帧头，加上FEC编码后的数据，最后加上2比特1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，流程见图6。

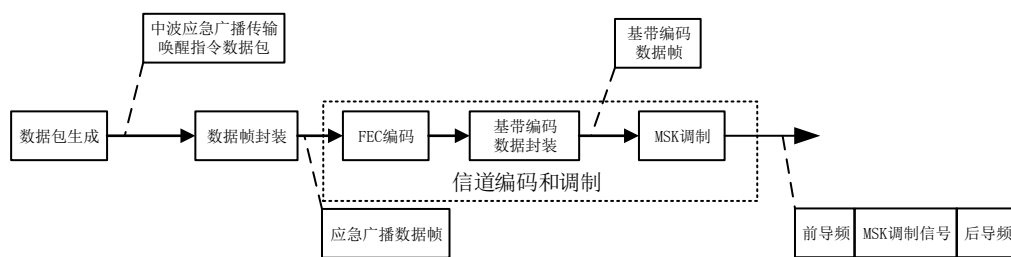


图 6 数据编码和调制流程

### 5.6.2 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。

### 5.6.3 前向纠错编码(FEC)

#### 5.6.3.1 编码方式

本标准采用的FEC编码方式为LDPC编码，1/2码率。

#### 5.6.3.2 码型结构

校验矩阵H为1280×2560的二进制矩阵，H的非0元素为1，共有9216位1，校验矩阵H见附录A。

校验矩阵H=(H1, H2), H1与H2均为1280×1280的方阵，生成矩阵G=H2<sup>-1</sup>H1，见附录B。

#### 5.6.3.3 前向纠错编码

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：

$$s^T = Gm^T, \quad G \text{ 为生成矩阵。}$$

### 5.6.4 信号产生与调制

#### 5.6.4.1 调制方式

信号调制方式采用MSK调制。

#### 5.6.4.2 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 $f_2=3\text{kHz}$ 。

#### 5.6.4.3 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。

#### 5.6.4.4 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%到100%之间。

信号产生过程中应保持各部分波形和相位连续。

## 6 中波发射台站处理要求

### 6.1 总体要求

中波发射台站要实现对应急广播消息的接收和处理，需要安装部署应急广播适配器、中波唤醒指令生成及插入设备、配备具有应急广播切换功能的音频切换器并进行相应改造。应急广播适配器应能接收和解析应急广播平台发来的应急广播消息，并对本系统内的应急广播消息生命周期进行管理，反馈应急广播消息处理响应结果，处理流程参见附录C。

### 6.2 系统时间校时

应急广播适配器应配置有自动校时机制，系统时钟误差应不超过1秒。

### 6.3 应急广播消息接收、封装和播发处理

应急广播消息的接收处理应实现仅播出应急广播音频信号和发出中波应急广播传输唤醒指令两种模式：

#### a) 播出应急广播音频信号：

- 1) 应能够实时接收、解析和保存应急广播平台下发的应急广播消息，能根据应急广播消息的要求，输出应急广播音频信号至音频切换器；
- 2) 能控制音频切换器，切换播出应急音频节目；
- 3) 应将收到的有效应急广播消息按照消息级别和开始时间排序，针对同一覆盖区域的同一时刻只封装播发级别最高、开始时间最近的一条应急广播消息；
- 4) 对收到的已过期应急广播消息应不进行处理；
- 5) 能收集音频切换器等设备的信息和状态数据，将应急广播消息播发结果反馈至应急广播平台。

#### b) 发出中波应急广播传输唤醒指令：

- 1) 应能够实时接收、解析和保存应急广播平台下发的应急广播消息，能根据应急广播消息的要求，输出应急广播音频信号至中波唤醒指令生成及插入设备；
- 2) 能控制中波唤醒指令生成及插入设备生成基带格式的中波应急广播传输唤醒指令，指令格式见图3和表2定义，并在应急广播音频信号中插入；
- 3) 能控制音频切换器，切换播出应急音频节目；

- 4) 应将收到的有效应急广播消息按照消息级别和开始时间排序，针对同一覆盖区域的同一时刻只封装播发级别最高、开始时间最近的一条应急广播消息；
- 5) 对收到的已过期应急广播消息应不进行处理；
- 6) 能收集中波唤醒指令生成及插入设备、音频切换器等设备的信息和状态数据，将应急广播消息播发结果反馈至应急广播平台。

#### 6.4 应急广播并发处理

应急广播的并发处理应满足以下要求：

- a) 应能接收和处理多个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，同时开始播发 B，当 B 播发结束且 A 播发未结束时，应继续播发 A。

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，当 A 播发结束且 B 播发未结束时，应继续播发 B。

#### 7 中波应急广播终端对应急广播消息的解调接收和处理要求

##### a) 应急广播开播响应

中波应急广播接收终端锁定在指定频点，实时监听接收中波应急广播传输唤醒指令，进行指令安全性验证、区域码匹配后，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，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，也须立即停止播出，恢复锁定在预设频点继续等待下一次开播指令。

附 录 A  
(规范性附录)  
LDPC 码校验矩阵 H

校验矩阵H是一个1280x2560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)  
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 (125, 31) (350, 31) (565, 31) (925, 31) (1201, 31) (126, 32)  
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(734, 2270) (990, 2270) (735, 2271) (991, 2271) (736, 2272) (992, 2272)  
(737, 2273) (993, 2273) (738, 2274) (994, 2274) (739, 2275) (995, 2275)  
(740, 2276) (996, 2276) (741, 2277) (997, 2277) (742, 2278) (998, 2278)  
(743, 2279) (999, 2279) (744, 2280) (1000, 2280) (745, 2281) (1001, 2281)  
(746, 2282) (1002, 2282) (747, 2283) (1003, 2283) (748, 2284) (1004, 2284)  
(749, 2285) (1005, 2285) (750, 2286) (1006, 2286) (751, 2287) (1007, 2287)  
(752, 2288) (1008, 2288) (753, 2289) (1009, 2289) (754, 2290) (1010, 2290)  
(755, 2291) (1011, 2291) (756, 2292) (1012, 2292) (757, 2293) (1013, 2293)  
(758, 2294) (1014, 2294) (759, 2295) (1015, 2295) (760, 2296) (1016, 2296)  
(761, 2297) (1017, 2297) (762, 2298) (1018, 2298) (763, 2299) (1019, 2299)  
(764, 2300) (1020, 2300) (765, 2301) (1021, 2301) (766, 2302) (1022, 2302)  
(767, 2303) (1023, 2303) (768, 2304) (1024, 2304) (769, 2305) (1025, 2305)  
(770, 2306) (1026, 2306) (771, 2307) (1027, 2307) (772, 2308) (1028, 2308)  
(773, 2309) (1029, 2309) (774, 2310) (1030, 2310) (775, 2311) (1031, 2311)  
(776, 2312) (1032, 2312) (777, 2313) (1033, 2313) (778, 2314) (1034, 2314)



(779, 2315) (1035, 2315) (780, 2316) (1036, 2316) (781, 2317) (1037, 2317)  
(782, 2318) (1038, 2318) (783, 2319) (1039, 2319) (784, 2320) (1040, 2320)  
(785, 2321) (1041, 2321) (786, 2322) (1042, 2322) (787, 2323) (1043, 2323)  
(788, 2324) (1044, 2324) (789, 2325) (1045, 2325) (790, 2326) (1046, 2326)  
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(794, 2330) (1050, 2330) (795, 2331) (1051, 2331) (796, 2332) (1052, 2332)  
(797, 2333) (1053, 2333) (798, 2334) (1054, 2334) (799, 2335) (1055, 2335)  
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(803, 2339) (1059, 2339) (804, 2340) (1060, 2340) (805, 2341) (1061, 2341)  
(806, 2342) (1062, 2342) (807, 2343) (1063, 2343) (808, 2344) (1064, 2344)  
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(812, 2348) (1068, 2348) (813, 2349) (1069, 2349) (814, 2350) (1070, 2350)  
(815, 2351) (1071, 2351) (816, 2352) (1072, 2352) (817, 2353) (1073, 2353)  
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(821, 2357) (1077, 2357) (822, 2358) (1078, 2358) (823, 2359) (1079, 2359)  
(824, 2360) (1080, 2360) (825, 2361) (1081, 2361) (826, 2362) (1082, 2362)  
(827, 2363) (1083, 2363) (828, 2364) (1084, 2364) (829, 2365) (1085, 2365)  
(830, 2366) (1086, 2366) (831, 2367) (1087, 2367) (832, 2368) (1088, 2368)  
(833, 2369) (1089, 2369) (834, 2370) (1090, 2370) (835, 2371) (1091, 2371)  
(836, 2372) (1092, 2372) (837, 2373) (1093, 2373) (838, 2374) (1094, 2374)  
(839, 2375) (1095, 2375) (840, 2376) (1096, 2376) (841, 2377) (1097, 2377)  
(842, 2378) (1098, 2378) (843, 2379) (1099, 2379) (844, 2380) (1100, 2380)  
(845, 2381) (1101, 2381) (846, 2382) (1102, 2382) (847, 2383) (1103, 2383)  
(848, 2384) (1104, 2384) (849, 2385) (1105, 2385) (850, 2386) (1106, 2386)  
(851, 2387) (1107, 2387) (852, 2388) (1108, 2388) (853, 2389) (1109, 2389)  
(854, 2390) (1110, 2390) (855, 2391) (1111, 2391) (856, 2392) (1112, 2392)  
(857, 2393) (1113, 2393) (858, 2394) (1114, 2394) (859, 2395) (1115, 2395)  
(860, 2396) (1116, 2396) (861, 2397) (1117, 2397) (862, 2398) (1118, 2398)  
(863, 2399) (1119, 2399) (864, 2400) (1120, 2400) (865, 2401) (1121, 2401)  
(866, 2402) (1122, 2402) (867, 2403) (1123, 2403) (868, 2404) (1124, 2404)  
(869, 2405) (1125, 2405) (870, 2406) (1126, 2406) (871, 2407) (1127, 2407)  
(872, 2408) (1128, 2408) (873, 2409) (1129, 2409) (874, 2410) (1130, 2410)  
(875, 2411) (1131, 2411) (876, 2412) (1132, 2412) (877, 2413) (1133, 2413)  
(878, 2414) (1134, 2414) (879, 2415) (1135, 2415) (880, 2416) (1136, 2416)  
(881, 2417) (1137, 2417) (882, 2418) (1138, 2418) (883, 2419) (1139, 2419)  
(884, 2420) (1140, 2420) (885, 2421) (1141, 2421) (886, 2422) (1142, 2422)  
(887, 2423) (1143, 2423) (888, 2424) (1144, 2424) (889, 2425) (1145, 2425)  
(890, 2426) (1146, 2426) (891, 2427) (1147, 2427) (892, 2428) (1148, 2428)  
(893, 2429) (1149, 2429) (894, 2430) (1150, 2430) (895, 2431) (1151, 2431)  
(896, 2432) (1152, 2432) (897, 2433) (1153, 2433) (898, 2434) (1154, 2434)  
(899, 2435) (1155, 2435) (900, 2436) (1156, 2436) (901, 2437) (1157, 2437)  
(902, 2438) (1158, 2438) (903, 2439) (1159, 2439) (904, 2440) (1160, 2440)  
(905, 2441) (1161, 2441) (906, 2442) (1162, 2442) (907, 2443) (1163, 2443)

(908, 2444) (1164, 2444) (909, 2445) (1165, 2445) (910, 2446) (1166, 2446)  
(911, 2447) (1167, 2447) (912, 2448) (1168, 2448) (913, 2449) (1169, 2449)  
(914, 2450) (1170, 2450) (915, 2451) (1171, 2451) (916, 2452) (1172, 2452)  
(917, 2453) (1173, 2453) (918, 2454) (1174, 2454) (919, 2455) (1175, 2455)  
(920, 2456) (1176, 2456) (921, 2457) (1177, 2457) (922, 2458) (1178, 2458)  
(923, 2459) (1179, 2459) (924, 2460) (1180, 2460) (925, 2461) (1181, 2461)  
(926, 2462) (1182, 2462) (927, 2463) (1183, 2463) (928, 2464) (1184, 2464)  
(929, 2465) (1185, 2465) (930, 2466) (1186, 2466) (931, 2467) (1187, 2467)  
(932, 2468) (1188, 2468) (933, 2469) (1189, 2469) (934, 2470) (1190, 2470)  
(935, 2471) (1191, 2471) (936, 2472) (1192, 2472) (937, 2473) (1193, 2473)  
(938, 2474) (1194, 2474) (939, 2475) (1195, 2475) (940, 2476) (1196, 2476)  
(941, 2477) (1197, 2477) (942, 2478) (1198, 2478) (943, 2479) (1199, 2479)  
(944, 2480) (1200, 2480) (945, 2481) (1201, 2481) (946, 2482) (1202, 2482)  
(947, 2483) (1203, 2483) (948, 2484) (1204, 2484) (949, 2485) (1205, 2485)  
(950, 2486) (1206, 2486) (951, 2487) (1207, 2487) (952, 2488) (1208, 2488)  
(953, 2489) (1209, 2489) (954, 2490) (1210, 2490) (955, 2491) (1211, 2491)  
(956, 2492) (1212, 2492) (957, 2493) (1213, 2493) (958, 2494) (1214, 2494)  
(959, 2495) (1215, 2495) (960, 2496) (1216, 2496) (961, 2497) (1217, 2497)  
(962, 2498) (1218, 2498) (963, 2499) (1219, 2499) (964, 2500) (1220, 2500)  
(965, 2501) (1221, 2501) (966, 2502) (1222, 2502) (967, 2503) (1223, 2503)  
(968, 2504) (1224, 2504) (969, 2505) (1225, 2505) (970, 2506) (1226, 2506)  
(971, 2507) (1227, 2507) (972, 2508) (1228, 2508) (973, 2509) (1229, 2509)  
(974, 2510) (1230, 2510) (975, 2511) (1231, 2511) (976, 2512) (1232, 2512)  
(977, 2513) (1233, 2513) (978, 2514) (1234, 2514) (979, 2515) (1235, 2515)  
(980, 2516) (1236, 2516) (981, 2517) (1237, 2517) (982, 2518) (1238, 2518)  
(983, 2519) (1239, 2519) (984, 2520) (1240, 2520) (985, 2521) (1241, 2521)  
(986, 2522) (1242, 2522) (987, 2523) (1243, 2523) (988, 2524) (1244, 2524)  
(989, 2525) (1245, 2525) (990, 2526) (1246, 2526) (991, 2527) (1247, 2527)  
(992, 2528) (1248, 2528) (993, 2529) (1249, 2529) (994, 2530) (1250, 2530)  
(995, 2531) (1251, 2531) (996, 2532) (1252, 2532) (997, 2533) (1253, 2533)  
(998, 2534) (1254, 2534) (999, 2535) (1255, 2535) (1000, 2536) (1256, 2536)  
(1001, 2537) (1257, 2537) (1002, 2538) (1258, 2538) (1003, 2539) (1259, 2539)  
(1004, 2540) (1260, 2540) (1005, 2541) (1261, 2541) (1006, 2542) (1262, 2542)  
(1007, 2543) (1263, 2543) (1008, 2544) (1264, 2544) (1009, 2545) (1265, 2545)  
(1010, 2546) (1266, 2546) (1011, 2547) (1267, 2547) (1012, 2548) (1268, 2548)  
(1013, 2549) (1269, 2549) (1014, 2550) (1270, 2550) (1015, 2551) (1271, 2551)  
(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  
(规范性附录)  
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	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB
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	0D81B6DB	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	0D81B6DB	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	0D81B6DB
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
0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	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	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	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	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	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	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB	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	0D81B6DB	D6C0DB6D	DB416DB6	0D81B6DB
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	0D81B6DB	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	0D81B6DB	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	0D81B6DB
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  
 OD81B6DB D6C0DB6D DB416DB6 OD81B6DB 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 OD81B6DB D6C0DB6D DB416DB6 OD81B6DB 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 OD81B6DB D6C0DB6D DB416DB6 OD81B6DB 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 OD81B6DB D6C0DB6D DB416DB6 OD81B6DB 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 OD81B6DB D6C0DB6D DB416DB6 OD81B6DB  
 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 OD81B6DB 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

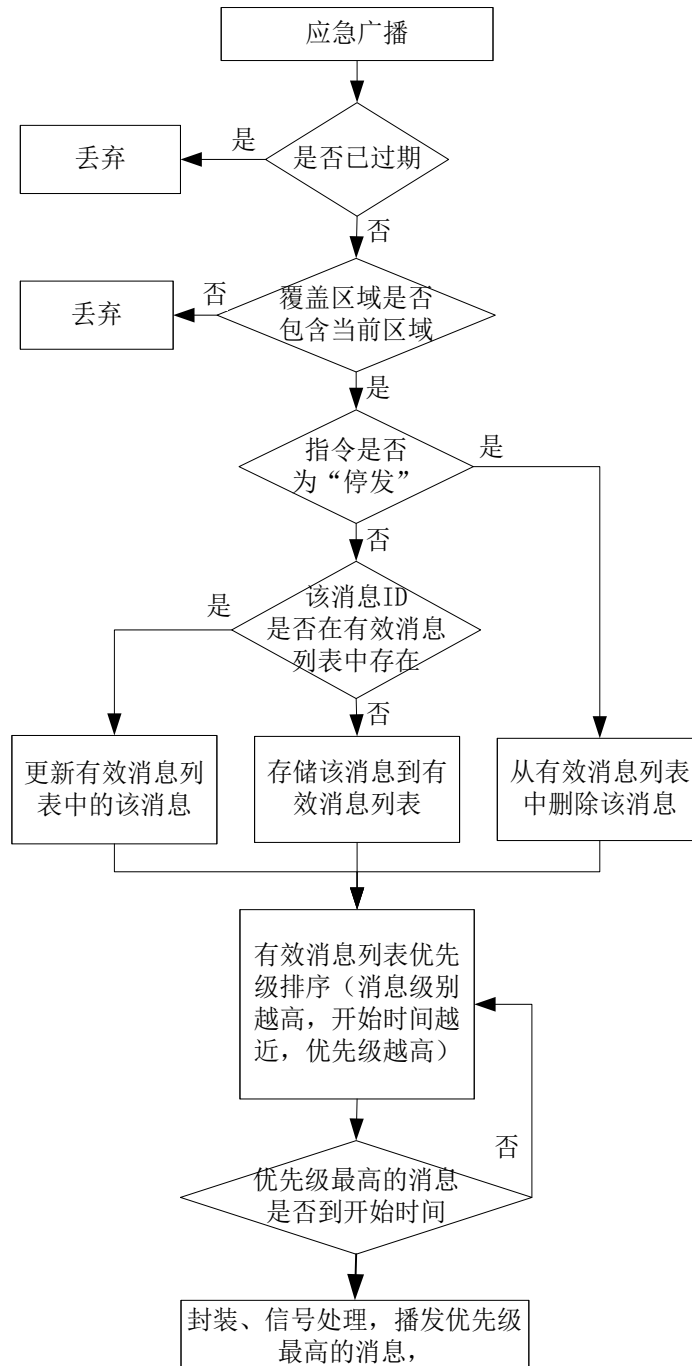
G[40]:

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  
(资料性附录)

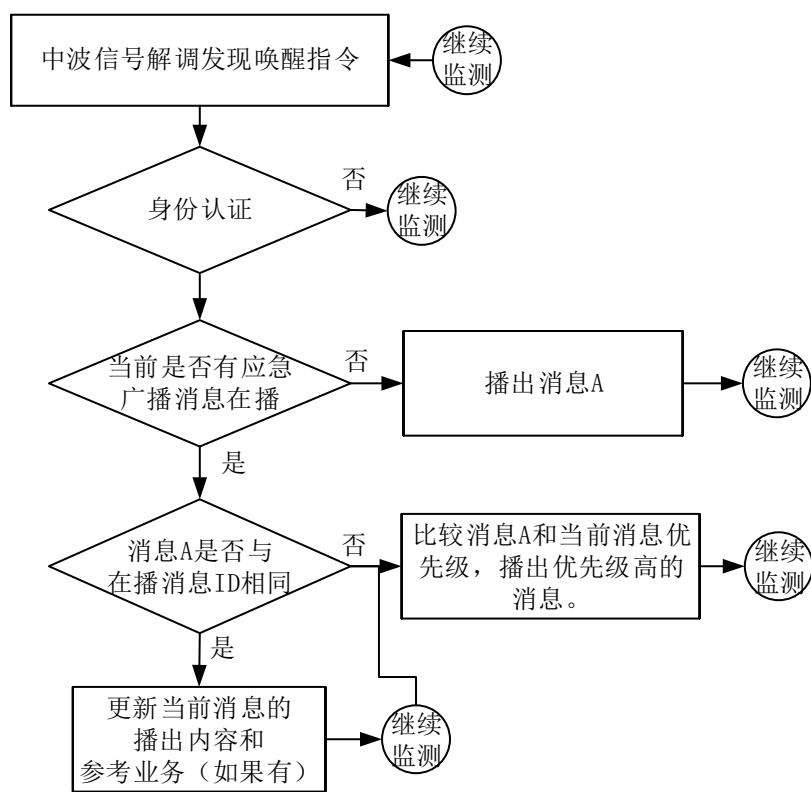
中波发射台应急广播消息接收系统和接收终端对应急广播消息处理示例

图C. 1给出了中波发射台应急广播消息接收系统对应急广播消息的处理流程示例。



图C. 1 中波发射台应急广播消息接收系统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  
(资料性附录)

中波应急广播终端对应急广播信号的解调接收和处理示例

图D.1为中波应急广播终端对应急广播信号的解调接收和处理示例，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）和指令验证等环节。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。

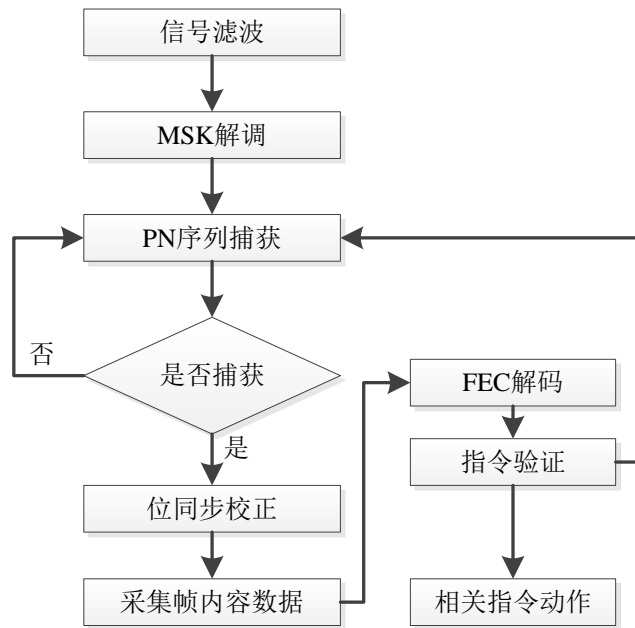


图 D.1 接收装置信号处理流程图

## 参 考 文 献

- [1] 国家应急平台体系信息资源分类与编码规范
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