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Title	**Terminology Change for H-ARQ MAP**
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Re:	
Abstract	**Terminology Change for H-ARQ MAP**
Purpose	Adoption of proposed changes into P802.16d /D5-2004
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1 Introduction

1.1 Problem

Several terms used in the H-ARQ MAP specification does not have consistency. This will lead a reader to a miss understanding of the spec. Here, we propose text changes to correct this.

1.2 Remedy

Table 1 Suggested Name Convention

Old Term	New Term
Normal subchannel	Diversity
H-ARQ MAP message	Compact MAP message
H-ARQ Compact xxx	Compact xxx
Compact DL-MAP IE for normal subchannel	Diversity Compact DL-MAP IE
Compact DL-MAP IE for band AMC	Band AMC Compact DL-MAP IE
Compact DL-MAP IE for safety	Safety Compact DL-MAP IE
Compact DL-MAP IE for DIUC	DIUC Compact DL-MAP IE
Compact DL-MAP IE format for H-ARQ ACK Bitmap	H-ARQ ACK Bitmap Compact DL-MAP IE
Compact DL-MAP IE for extension	Extension Compact DL-MAP IE
Compact UL-MAP IE for normal subchannel	Diversity Compact UL-MAP IE
Compact UL-MAP IE for band AMC	Band AMC Compact UL-MAP IE
Compact UL-MAP IE for safety	Safety Compact UL-MAP IE
Compact UL-MAP IE for UIUC	UIUC Compact UL-MAP IE
Compact UL-MAP IE for H-ARQ Region allocation	H-ARQ ACK Region Compact UL-MAP IE
Compact UL-MAP IE for CQICH Region allocation	CQICH Region Compact UL-MAP IE
Compact UL-MAP IE for extension	Extension Compact UL-MAP IE
DL-MAP Type	Type
UL-MAP Type	Type
No. Subchannels	Duration
Subchannels	Slots
Compact DL-MAP Type	Compact DL-MAP IE Type
Compact UL-MAP Type	Compact UL-MAP IE Type

2 Proposed Text

6.3.2.3.43 ~~H-ARQ~~ Compact MAP message

This section describes the ~~H-ARQ~~ Compact MAP message, which is designed for H-ARQ enabled SS. This IE shall only be used by a BS supporting H-ARQ, for SS supporting H-ARQ.

6.3.2.3.43.1 ~~H-ARQ~~ Compact MAP message format

The ~~H-ARQ~~ Compact MAP message format is presented in Table 86. This message includes Compact DL/ULMAP_ IE and defines the access information for the downlink and uplink burst of H-ARQ enabled SS. This message shall be sent without a generic MAC header.

BS may broadcast multiple ~~H-ARQ~~ Compact MAP messages using multiple burst after the MAP message. Each HARQ MAP message should have a different modulation and coding rate. If the frame contains DCD or UCD message following the MAP message, the H-ARQ MAP should follow DCD or UCD message.

The DL-MAP_IEs in the MAP message describe the location and coding and modulation schemes of the bursts. The order of DLMAP_IEs in the MAP message and the bursts for ~~H-ARQ~~ Compact MAP messages is determined by the coding and modulation scheme of the burst. The burst for ~~H-ARQ~~ Compact MAP message with lower rate coding and modulation should be placed before other bursts for H-ARQ Compact MAP message.

The presence of the ~~H-ARQ~~ Compact MAP message format is indicated by the contents of the three most significant bits of the first data byte of a burst. These bytes overlay the HT and EC bits of a generic MAC header. When these bits are both set to 1 (an invalid combination for a standard header) and followed by 1 bits of 1, the Compact DL-MAP format is present.

Table 86—~~H-ARQ~~ Compact MAP message format

Syntax	Size	Notes
H-ARQ_MAP message format() {		
H-ARQ MAP Indicator = 111	3 bits	Set to 0b111
H-ARQ_UL-MAP appended	1 bit	
CRC appended	1 bit	
Map message length	9 bits	Length of H-ARQ MAP in bytes
DL IE count	6 bits	Number of DL IE in the burst
for (i=0; i < DL IE count; i++){		
Compact DL-MAP IE()	variable	
}		
If (Compact_UL-MAP appended ==1){		
while (map data remains) {		
Compact ~~DL~~ UL-MAP IE()	variable	
}		
}		
if !(byte boundary) {		
Padding nibble	4 bits	
}		
}		

H-ARQ MAP Indicator
The value of 0b111 means this message is a ~~H-ARQ~~ Compact MAP message
Compact UL-MAP appended
A value of 1 indicates a ~~compact~~ Compact UL-MAP is appended to the current ~~compact~~ Compact DL-MAP data structure
CRC appended
A value of one indicates a CRC-32 value is appended to the end of the H-ARQ MAP data. The CRC is computed across all bytes of the H-ARQ MAP starting with the byte containing the H-ARQ MAP indicator through the last byte of the map as specified by the Map message length field. The

CRC calculation is the same as that used for standard MAC messages. A value of zero indicates that no CRC is appended.

MAP message length

This value specifies the length of the ~~H-ARQ~~ Compact MAP message beginning with the byte containing the H-ARQ MAP indicator and ending with the last byte of the ~~H-ARQ~~ Compact MAP message. The length includes the computed 32-bit CRC value if the CRC appended indicator is on.

DL IE count

This field holds the number of IE entries in the following list of ~~DL-MAP IEs~~ DL-MAP_IEs.

~~Table 87 and Table 88 represent the types of compact DL/UL MAP.~~

Table 87—Compact_DL-MAP IE Types

Compact DL-MAP IE Type	Description
0	~~Normal subchannel~~ Diversity
1	Band AMC
2	Safety
3	DIUC
4	Format_Configuration_IE
5	H-ARQ_ACK_BITMAP_IE
6	*reserved*
7	Extension

Table 88—Compact_UL-MAP IE Types

Compact UL-MAP IE Type	Description
0	~~Normal subchannel~~ Diversity
1	Band AMC
2	Safety
3	UIUC
4	H-ARQ_Region_IE
5	CQI_Region_IE
6	*reserved*
7	Extension

6.3.2.3.43.2 Format Configuration

Table 89 represents the format of Format_Configuration_IE that configures CID type, safety pattern, maximum logical bands and frame structure. The format should be set to default value at the start of each frame.

Table 89—Format configuration IE

Syntax	Size	Notes
Compact_DL-MAP_IE( ) {		
~~DL-MAP~~ **Type = 4**	3 bits	Format_Configuration_IE
New Format Indication	1 bit	0 = Use the format configured by the latest Format_Configuration_IE 1 = New format
if (New Format Indication == 1) {		
CID Type	2 bits	00 = Normal CID 01 = RCID11 (default) 10 = RCID7 11 = RCID3
Safety Pattern	~~10~~ 5 bits	
Subchannel type for Band AMC		See Band AMC specification (8.4.6.3). 00 = Default type (default) 01 = 1x6 type 10 = 2x3 type 11 = 3x2 type
Max Logical Bands	2 bits	0 = 3 bands,

		1 = 6 bands, 2 = 12 bands (default) 3 = 24 bands
No. Symbols for Broadcast	~~4~~ 5 bits	No. Symbol, (default = 0)
No. Symbols for DL Band AMC	~~4~~ 6 bits	No. Symbol, (default = 0)
No. Symbols for UL Band AMC	~~4~~ 6 bits	No. Symbol, (default = 0)
}		
}		

New Format Indication
If this value set to 0, the format should be configured by the latest Format Configuration_IE in the previous frames. Otherwise, whole parameters in Format Configuration IE should be configured. The configured parameters are valid for the following ~~Compact_DL/UL_MAP_IE~~ Compact DL/UL-MAP_IE. At the start of each frame all parameters are set to default values.
CID Type
This value specifies CID type used in the ~~Compact_DL/UL_MAP_IE~~ Compact DL/UL-MAP_IE.
Safety Pattern
If this value is less than 16, the number of safety bins is 12 and the indices of allocated bins for safety are $16m+x$, where x is the value of Safety Pattern and $m = 0 \ldots 11$. If this value is not less than 16, the number of safety bins is 24 and the indices of allocated bins for safety are $16m+x'$ and $16m+(x'+8)$, where $x' = x - 16$ and $m = 0 \ldots 11$.
Subchannel Type for Band AMC
This value specifies the subchannel type for Band AMC subchannel. See related PHY specification.
No. Symbols for Broadcast
This specifies the number of symbols allocated for Broadcast subchannel.
No. Symbols for DL Band AMC
This specifies the number of symbols allocated for DL Band AMC subchannel. The other DL symbols excluding the symbols for Broadcast and DL Band are allocated for the DL ~~Normal subchannel~~ Diversity.
No. Symbols for UL Band AMC
This specifies the number of symbols allocated for UL Band AMC subchannel. The other UL symbols excluding the symbols for UL Band are allocated for the UL ~~Normal subchannel~~ Diversity.
Max Logical Bands
This value specifies the maximum number of logical bands for Band AMC. The size of 3 fields (No. Selected Bands, Band BITMAP and Band Index) in the DL/UL-MAP_IE for Bands AMC depends on this value. Table 90 represents the fields in the DL/UL-MAP_IE and specific values.

Table 90—Field length for Band AMC MAP_IE

Logical Bands	24 Bands	12 Bands	6 Bands	3 Bands
Max Logical Bands	11	10	01	00
Nb-Band (# of bits for No. Selected Bands)	4 bits	4 bits	4 bits	0 bits
Nb-BITMAP (# of bits for Band BITMAP)	24 bits	12 bits	8 bits	4 bits
Nb-Index (# of bits for Band Index)	8 bits	4 bits	4 bits	0 bits

6.3.2.3.43.3 Reduced CID

Figure 91 presents the format of reduced CID. BS may use reduced CID instead of basic CID or multicast CID to reduce the size of HARQ MAP message. The type of reduced CID is determined by BS considering the range of basic CIDs of SS connected with the BS and specified by the RCID_Type field of the Format Configuration IE.

The reduced CID is composed of 1 bit of prefix and n-bits of LSB of CID of SS. The prefix is set to 1 for the broadcast CID or multicast CID and set to 0 for basic CID. The reduced CID can not be used instead of transport CID, primary management CID or secondary management CID.

Figure 22 shows the decoding of reduced CID when the RCID_Type is set to 3.

~~RDC11~~, RCID11

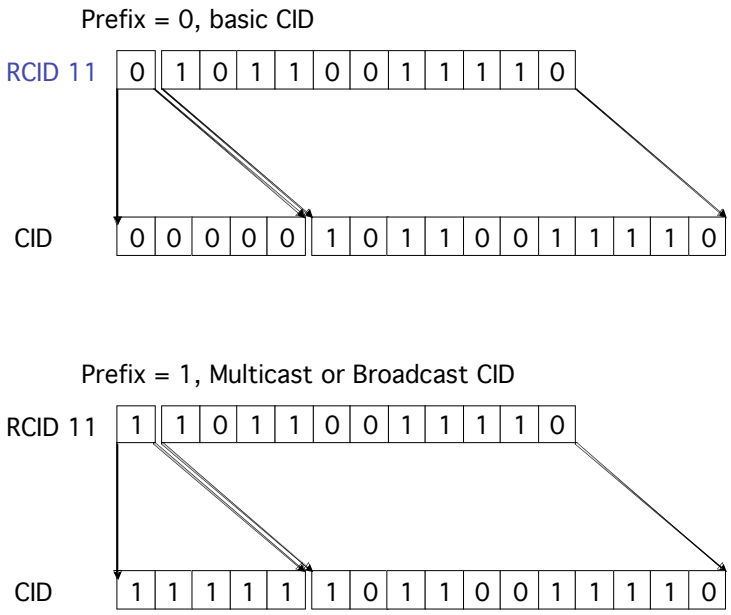

Table 91—RCID_IE format

Syntax	Size	Notes
RCID_IE () {		
if (RCID_Type == 0) {		RCID_Type is specified in Format_Configuration IE
CID	16 bits	Normal CID
} else {		
Prefix	1 bit	For multicast, AAS, Padding & broadcast burst temporary disable RCID
if (Prefix == 1){		
RCID 11	11 bits	11 LSB of Multicast, AAS or Broadcast CID
} else {		
if (RCID_Type == 1) {		
RCID 11	11 bits	11 LSB of Basic CID
} else if (RCID_Type == 2) {		
RCID 7	7 bits	7 LSB of Basic CID
} else if (RCID_Type == 3) {		
RCID 3	3 bits	3 LSB of Basic CID
}		
}		
}		
}		

CID
Normal 16 bits CID
Prefix
A value of one indicates that 11 bits RCID for broadcast and multicast follows the prefix. Otherwise, the n-bits RCID for basic CID follows the prefix. The value of n is determined by the RCID_Type field in Format_Configuration_IE.
RCID n
n-bits LSB of CID

6.3.2.3.43.4 H-ARQ control IE

The format of ~~H-ARQ_Control_IE~~ H-ARQ Control_ IE, which includes encoding/decoding information for H-ARQ enabled DL/ UL bursts, is presented in Table 92. This IE shall be located in the ~~compact~~ Compact DL/UL MAP_IE.

Table 92—H-ARQ_Control IE format

Syntax	Size	Notes
H-ARQ_Control_IE ()		
Prefix	1 bit	0 = Temporary disable H-ARQ 1 = enable H-ARQ
if (Prefix == 1) {		
AI_SN	1 bit	H-ARQ ID Seq. No
SPID	2 bits	Subpacket ID
ACID	4 bits	H-ARQ CH ID
} else {		
reserved	3 bits	Shall be set to zero
}		
}		

Prefix
Indicates whether H-ARQ is enabled or not.
AI_SN
Defines ~~ARQ~~ H-ARQ Identifier Sequence Number. This is toggled between '0' and '1' on successfully transmitting each encoder packet with the same ~~ARQ~~ H-ARQ channel.
SPID
Defines SubPacket ID, which is used to identify the four subpackets generated from an encoder packet.
ACID
Defines H-ARQ Channel ID, which is used to identify H-ARQ channels. Each connection can have multiple HARQ channels, each of which may have an encoder packet transaction pending.

6.3.2.3.43.5 CQICH Control IE

~~The format of CQICH Control IE is presented in Table 93.~~

Table 93—~~H-ARQ~~ CQICH_Control IE format

Syntax	Size	Notes
CQICH_Control_IE () {		
CQICH indicator	1 bit	If the indicator is set to 1, the CQICH_Control IE follows.
if (CQICH indicator == 1) {		
Allocation Index	6 bits	Index to the channel in a frame the CQI report should be transmitted by the SS.
Period (p)	2 bits	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS in every 2_p frames.
Frame offset	3 bits	The MSS starts reporting at the frame of which the number has the same 3 LSB as the specified frame offset. If the Current frame is specified, the MSS should start reporting in 8 frames
Duration (d)	4 bits	A CQI feedback is transmitted on the CQI channels indexed by the (CQI Channel Index) by the SS for $2_{(d-1)}$ frames. If d is 0b0000, the CQICH is de-allocated. If d is 0b1111, the MSS should report until the BS command for the MSS to stop.
} else {		
reserved	3 bits	Shall be set to zero
}		
}		

Allocation Index
It indicates its position from the start of the CQICH region.
Period
It informs the SS of the period of CQI reports.
Frame offset
It informs the SS of when to start. The SS starts reporting at the frame of which the number has the same 3 LSB as the specified frame offset. If the current frame is specified, the SS should start reporting in 8 frames.
Duration
It indicates when the SS should stop reporting unless the CQICH allocation is refreshed beforehand. If duration d == 0b0000, the BS is intended to de-allocate the CQICH. If d == 0b1111, the CQICH is allocated indefinitely and the SS should report until the BS commands the SS to stop, which happens it receives another MAP_IE with d =0b0000.

6.3.2.3.43.6 Compact DL-MAP IE

6.3.2.3.43.6.1 Diversity Compact DL-MAP IE ~~for normal subchannel~~

~~The format of Compact DL-MAP IE for normal subchannel is presented in Table 94.~~

Table 94—~~H-ARQ~~ Diversity Compact_DL-MAP IE format ~~for normal subchannel~~

Syntax	Size	Notes
Compact_DL-MAP_IE () {		
~~DL-MAP~~ **Type =0**	3 bits	
UL-MAP IE append	1 bit	
RCID_IE	*variable*	
***NEP* code**	4 bits	Code of encoder packet bits (see 8.4.9.2.3.5)
***NSCH* code**	4 bits	Code of allocated ~~subchannels~~ slots (see 8.4.9.2.3.5)
H-ARQ_Control_IE	*variable*	
CQICH_Control_IE	*variable*	
if (**UL-MAP IE append**) {		
***NEP* code for UL**	4 bits	
***NSCH* code for UL**	4 bits	
H-ARQ_Control_IE for UL	*variable*	
}		
}		

~~DL-MAP~~ **Type**
This value specifies the type of the ~~compact~~ Compact DL-MAP IE. A value of 0 indicates the Normal Subchannel.
UL-MAP IE append
A value of 1 indicates the uplink access information is appended to the end of the DL-MAP IE.
RCID_IE
Represent the assignment of the IE.
NEP code, NSCH code
The combination of *NEP* code and *NSCH* code indicates the number of allocated ~~subchannels~~ slots and scheme of coding and modulation for the DL burst.
NEP code for UL, NSCH code for UL
The combination of *NEP* code and *NSCH* code indicates the number of allocated ~~subchannels~~ slots and scheme of coding and modulation for the UL burst

6.3.2.3.43.6.2 Band AMC Compact DL-MAP IE ~~for Band AMC Subchannel~~

~~The format of Compact DL-MAP IE for Band AMC Subchannel is presented in Table 95.~~

Table 95—~~H-ARQ~~ Band AMC Compact_DL-MAP IE format ~~for band AMC~~

Syntax	Size	Notes
Compact_DL-MAP_IE () {		
~~DL-MAP~~ Type =1	3 bits	
reserved	1 bit	Shall be set to zero
RCID_IE	*variable*	
***NEP* code**	4 bits	Code of encoder packet bits (see 8.4.9.2.3.5)
***NSCH* code**	4 bits	Code of allocated ~~subchannels~~ slots (see 8.4.9.2.3.5)
Nband	Nb-Band bits	Number of bands, 0 = use BITMAP instead
if (Nband == 0) {		
Band BITMAP	Nb-BITMAP bits	n-th LSB is 1 if n-th band is selected
} else {		
for (i=0;i< Nband ; i++)		
Band Index	Nb-Index bits	Band selection.
}		
Allocation Mode	2 bits	Indicates the subchannel allocation mode. 00 = same number of ~~subchannels~~ slots for the selected bands 01 = different number of ~~subchannels~~ slots for the selected bands 10 = total number of ~~subchannels~~ slots for the selected bands determined by *NSCH* code and *NEP* code 11 = reserved
reserved	2 bits	Shall be set to zero
if (Allocation Mode == 00){		
~~No. Subchannels~~ Duration	8 bits	
} else if (Allocation Mode == 01){		
for (i=0;i< band count; i++)		If Nband is 0, band count is the number of '1' in Band BITMAP. Otherwise band count is Nband.
~~No. Subchannels~~ Duration	8 bits	
}		
H-ARQ_Control_IE	*variable*	
CQICH_Control_IE	*variable*	
}		

~~DL-MAP~~ Type
This value specifies the type of the ~~compact~~ Compact DL-MAP IE. A value of 1 indicates the Band AMC Subchannel.
RCID_IE
Represent the assignment of the IE.
NEP code, NSCH code
The combination of *NEP* code and *NSCH* code indicates the number of allocated ~~subchannels~~ slots and scheme of coding and modulation for the DL burst.
Nband
Indicates the number of bands selected for the burst. If this value is set to 0, the Band BITMAP is used to indicate the number and the position of selected bands instead. The number of the maximum logical bands determines the length of this field.
Band BITMAP
This BITMAP is valid when Nband is 0. The n-th LSB of the Band BITMAP is set to 1 when the nth logical band is selected for the burst. If the number of the maximum logical bands is 12 then the length of the Band BITMAP is 12 bits. The band count is set to the number of '1's in the Band BITMAP. The number of the maximum logical bands determines the length of this field.
Band Index
This value indexes the selected band offset and is valid when Nband is larger than 0. The number of the maximum logical bands determines the length of this field.
Allocation Mode
This value indicates the subchannel allocation mode in the selected bands. The value is set to binary 00 when the same numbers of ~~subchannels~~ slots are allocated in the selected bands by the following field '~~No. Subchannels~~ Duration'. The value is set to 01 when different numbers of ~~subchannels~~ slots are allocated in each selected bands by the following fields "~~No. Subchannels~~ Duration". The value is set to 10 when the total number of ~~subchannels~~ slots allocated in the selected bands is defined by *NSCH* code and *NEP* code. The ~~subchannels~~ slots fill from the bands with lowest index. The allocation mode variant is shown in Figure 23.

~~No. Subchannels~~ Duration
This value indicates the number of ~~subchannels~~ slots allocated for this burst.

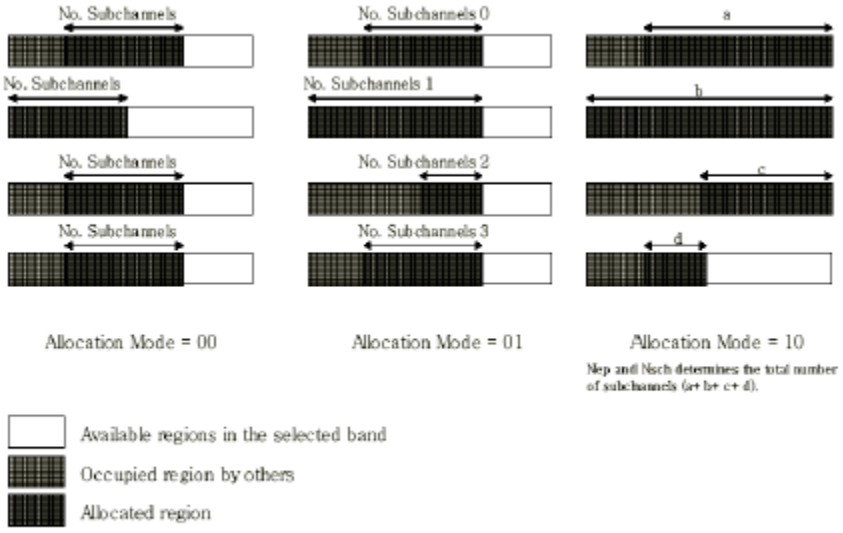

Figure 23—Subchannel allocation modes of Compact DL-MAP_IE for Band AMC

6.3.2.3.43.6.3 Safety Compact DL-MAP IE ~~for safety subchannel~~

~~The format of Compact DL-MAP IE for safety subchannel is presented in Table 96.~~

Table 96—~~H-ARQ~~ Safety Compact_DL-MAP IE format ~~for safety~~

Syntax	Size	Notes
Compact_DL-MAP_IE () {		
~~DL-MAP~~ **Type =2**	3 bits	
UL-MAP IE_append	1 bit	
RCID_IE	*variable*	
***NEP* code**	4 bits	Code of encoder packet bits (see 8.4.9.2.3.5)
***NSCH* code**	4 bits	Code of allocated ~~subchannels~~ slots (see 8.4.9.2.3.5)
BIN offset	8 bits	
H-ARQ_Control_IE	*variable*	
CQICH_Control_IE	*variable*	
if (**UL-MAP IE_append**) {		
***NEP* code for UL**	4 bits	Code of encoder packet bits (see 8.4.9.2.3.5)
***NSCH* code for UL**	4 bits	Code of allocated ~~subchannels~~ slots (see 8.4.9.2.3.5)
BIN offset for UL	8 bits	
H-ARQ_Control_IE for UL	*variable*	
}		
}		

~~DL-MAP~~ **Type**
This value specifies the type of the ~~compact~~ Compact DL-MAP IE. A value of 2 indicates the Safety Subchannel.
RCID_IE
Represent the assignment of the IE.
NEP code, NSCH code
The combination of *NEP* code and *NSCH* code indicates the number of allocated ~~subchannels~~ slots and scheme of coding and modulation for the DL burst.

BIN Offset
The offset of the BIN allocated for this DL burst. See appropriate specification.
NEP code for UL, NSCH code for UL
The combination of *NEP* code and *NSCH* code indicates the number of allocated ~~subchannels~~ slots and scheme of coding and modulation for the UL burst.
BIN Offset for UL
The offset of the BIN allocated for this UL burst. See appropriate specification.

6.3.2.3.43.6.4 DIUC Compact DL-MAP IE ~~for DIUC subchannel~~

~~The format of Compact DL-MAP IE for DIUC subchannel is presented in Table 97.~~

Table 97—~~H-ARQ~~ DIUC Compact_DL-MAP IE format ~~for DIUC subchannel~~

Syntax	Size	Notes
Compact_DL-MAP_IE () {		
~~DL-MAP~~ **Type =3**	3 bits	
reserved	1 bit	Shall be set to zero
DIUC	4 bits	
RCID_IE	*variable*	
~~No. Subchannels~~ **Duration**	8 bits	The number of ~~subchannels~~ slots allocated by the IE
}		

~~DL-MAP~~ **Type**
This value specifies the type of the ~~compact~~ Compact DL-MAP IE. A value of 3 indicates the DIUC type.
DIUC
This value indicates the usage of this burst.
RCID_IE
Represent the assignment of the IE.
~~No. Subchannels~~ **Duration**
This value indicates the number of ~~subchannels~~ slots allocated by the IE.

6.3.2.3.43.6.5 H-ARQ ACK BITMAP Compact DL-MAP IE ~~for H-ARQ ACK BITMAP~~

The H-ARQ_ACK_Bitmap information for the H-ARQ enabled UL bursts is delivered through the Compact_DL-MAP_IE as shown in Table 98. The bit position in the bitmap is determined by the order of the H-ARQ enabled UL bursts in the UL-MAP. The frame offset between the UL burst and the H-ARQACK-BITMAP is specified by "H-ARQ_ACK_Delay_for UL Burst" field in the DCD message.

For example, when a SS transmits a H-ARQ enabled burst at *i*-th frame and the burst is *j*-th H-ARQ enabled burst in the MAP, the SS should receive H-ARQ ACK at *j*-th bit of the BITMAP which is sent by the BS at *i*+(frame offset)-th frame.

Table 98—~~H-ARQ~~ H-ARQ ACK BITMAP Compact_DL-MAP IE format ~~for H-ARQ BITMAP~~

Syntax	Size	Notes
Compact_DL-MAP_IE () {		
~~DL-MAP~~ **Type =5**	3 bits	
Reserved	1 bit	Shall be set to zero
BITMAP Length	4 bits	Length in Bytes
BITMAP	*variable*	
}		

~~DL-MAP~~ **Type**

Defines the type of Compact DL-MAP. If the type value is 5, the Compact DL-MAP is for H-ARQACK-BITMAP.

BITMAP Length

Specifies the length of the following BITMAP field.

BITMAP

Includes H-ARQ ACK information for H-ARQ enabled UL bursts. The size of BITMAP should be equal or larger than the number of H-ARQ enabled UL-bursts.

6.3.2.3.43.6.6 Extension Compact DL-MAP IE ~~for extension~~

~~The format of Compact DL-MAP IE for extension is presented in Table 99.~~

Table 99—~~H-ARQ~~ Extension Compact_DL-MAP IE format ~~for extension~~

Syntax	Size	Notes
Compact_DL-MAP_IE () {		
~~DL-MAP~~ Type =7	3 bits	
DL-MAP sub-type	5 bits	Extension sub type
Length	4 bits	Length of the IE in Bytes
Payload	*variable*	Sub-type dependent payload
}		

~~DL-MAP~~ Type

This value specifies the type of the ~~compact~~ Compact DL-MAP IE. A value of 7 indicates the extension type.

DL-MAP Sub-Type

This value specifies the sub-type of the ~~compact~~ Compact DL-MAP IE.

Length

This indicates the length of this IE in Bytes. If a SS can't recognize the DL-MAP Sub-Type, it skips the IE.

Payload

The payload depends on the value of DL-MAP Sub-Type. The length of payload is Length -1 Bytes.

6.3.2.3.43.7 UL-MAP_IE

6.3.2.3.43.7.1 Diversity Compact UL-MAP IE ~~for normal subchannel~~

~~The format of Compact UL-MAP IE for normal subchannel is presented in Table 100.~~

Table 100—~~H-ARQ~~ Diversity Compact_UL-MAP IE format ~~for normal subchannel~~

Syntax	Size	Notes
Compact_UL-MAP_IE () {		
~~UL-MAP~~ Type =0	3 bits	
reserved	1 bit	Shall be set to zero
RCID_IE	*variable*	
***NEP* code**	4 bits	Code of encoder packet bits (see 8.4.9.2.3.5)
***NSCH* code**	4 bits	Code of allocated ~~subchannels~~ slots (see 8.4.9.2.3.5)
H-ARQ_Control_IE	*variable*	
}		

~~UL-MAP~~ Type

This value specifies the type of the ~~compact~~ Compact UL-MAP IE. A value of 0 indicates the Normal Subchannel.

RCID_IE

Represent the assignment of the IE.
NEP code, NSCH code
The combination of *NEP* code and *NSCH* code indicates the number of allocated ~~subchannels~~ slots and scheme of coding and modulation for the UL burst.

6.3.2.3.43.7.2 Band AMC Compact UL-MAP IE ~~for Band AMC Subchannel~~

~~The format of Compact UL-MAP IE for Band AMC Subchannel is presented in Table 101.~~

Table 101—~~H-ARQ~~ Band AMC Compact_UL-MAP IE format ~~for band AMC~~

Syntax	Size	Notes
Compact_UL-MAP_IE () {		
~~UL-MAP~~ **Type =band**	3 bits	
reserved	1 bit	Shall be set to zero
RCID_IE	*variable*	
***NEP* code**	4 bits	Code of encoder packet bits (see 8.4.9.2.3.5)
***NSCH* code**	4 bits	Code of allocated ~~subchannels~~ slots (see 8.4.9.2.3.5)
Nband	Nb-Band bits	Indicates the number of selected bands. 0 = BITMAP indicates the number and offset of selected bands
if (Nband == 0) {		
Band BITMAP	Nb-BITMAP bits	n-th LSB is 1 if n-th band is selected
} else {		
for (i=0;i< Nband ; i++)		
Band Index	Nb-Index bits	Band selection.
}		
Allocation Mode	2 bits	Indicates the subchannel allocation mode. 00 = same number of ~~subchannels~~ slots for the selected bands 01 = different number of ~~subchannels~~ slots for the selected bands 10 = total number of ~~subchannels~~ slots for the selected bands determined by *NSCH* code 11 = reserved
reserved	2 bits	Shall be set to zero
if (Allocation Mode == 00){		
~~No. Subchannels~~ **Duration**	8 bits	
} else if (Allocation Mode == 1){		
for (i=0;i< band count; i++)		If Nband is 0, band count is the number of '1' in Band BITMAP. Otherwise band count is Nband.
~~No. Subchannels~~ **Duration**	8 bits	
}		
H-ARQ_Control_IE	*variable*	
}		

~~UL-MAP~~ **Type**
This value specifies the type of the ~~compact~~ Compact UL-MAP IE. A value of 1 indicates the Band AMC Subchannel.
RCID_IE
Represent the assignment of the IE.
NEP code, NSCH code
The combination of *NEP* code and *NSCH* code indicates the number of allocated ~~subchannels~~ slots and scheme of coding and modulation for the UL burst.
Nband
Indicates the number of bands selected for the burst. If this value is set to 0, the Band BITMAP is used to indicate the number and the position of selected bands instead. The number of the maximum logical bands determines the length of this field.

Band BITMAP
This BITMAP is valid when Nband is 0. The n-th LSB of the Band BITMAP is set to 1 when the nth logical band is selected for the burst. If the number of the maximum logical bands is 12 then the length of the Band BITMAP is 12 bits. The band count is set to the number of '1's in the Band BITMAP. The number of the maximum logical bands determines the length of this field.
Band Index
This value indexes the selected band offset and is valid when Nband is larger than 0. The number of the maximum logical bands determines the length of this field.
Allocation Mode
This value indicates the subchannel allocation mode in the selected bands. The value is set to binary 00 when the same numbers of ~~subchannels~~ slots are allocated in the selected bands by the following field '~~No. Subchannels~~ Duration'. The value is set to 01 when different numbers of ~~subchannels~~ slots are allocated in each selected bands by the following fields "~~No. Subchannels~~ Duration". The value is set to 10 when the total number of ~~subchannels~~ slots allocated in the selected bands is defined by *NSCH* code and *NEP* code. The ~~subchannels~~slots fill from the bands with lowest index. The allocation mode variant is shown in Figure 23.
~~No. Subchannels~~ Duration
This value indicates the number of ~~subchannels~~ slots allocated for this burst.

6.3.2.3.43.7.3 Safety Compact UL-MAP IE ~~for safety subchannel~~

~~The format of Compact UL-MAP IE for safety subchannel is presented in Table 96.~~

Table 102—~~H-ARQ~~ Safety Compact_UL-MAP IE format ~~for safety~~

Syntax	Size	Notes
Compact_UL-MAP_IE () {		
~~UL-MAP~~ Type =2	3 bits	
reserved	1 bit	Shall be set to zero
RCID_IE	*variable*	
***NEP* code**	4 bits	Code of encoder packet bits (see 8.4.9.2.3.5)
***NSCH* code**	4 bits	Code of allocated ~~subchannels~~ slots (see 8.4.9.2.3.5)
BIN offset	8 bits	
H-ARQ_Control_IE	*variable*	
}		

~~UL-MAP~~ Type
This value specifies the type of the ~~compact~~ Compact UL-MAP IE. A value of 2 indicates the Safety Subchannel.
RCID_IE
Represent the assignment of the IE.
NEP code, NSCH code
The combination of *NEP* code and *NSCH* code indicates the number of allocated ~~subchannels~~ slots and scheme of coding and modulation for the UL burst.
BIN Offset
The offset of the BIN allocated for this UL burst.

6.3.2.3.43.7.4 UIUC Compact UL-MAP IE ~~for UIUC subchannel~~

~~The format of Compact UL-MAP IE for UIUC subchannel is presented in Table 97.~~

Table 103—~~H-ARQ~~ UIUC Compact_UL-MAP IE format ~~for UIUC subchannel~~

Syntax	Size	Notes
Compact_UL-MAP_IE () {		
~~UL-MAP~~ Type =4	3 bits	

reserved	1 bit	Shall be set to zero
UIUC	4 bits	
RCID_IE	*variable*	
~~No. Subchannels~~ Duration	8 bits	The number of ~~subchannels~~slots allocated by the IE
}		

~~UL-MAP~~ Type
This value specifies the type of the ~~compact~~ Compact UL-MAP IE. A value of 3 indicates the UIUC type.
UIUC
This value indicates the usage of this burst.
RCID_IE
Represent the assignment of the IE.
~~No. Subchannels~~ Duration
This value indicates the number of ~~subchannels~~ slots allocated by the IE.

6.3.2.3.43.7.5 H-ARQ ACK Region Compact UL-MAP IE ~~for H-ARQ Region allocation~~

The H-ARQ ACK region information is delivered through the Compact_UL-MAP_IE as shown in Table 104. SS sends ACK information for H-ARQ enabled DL bursts in the H-ARQ region specified by the IE.

The subchannels in the H-ARQ region are divided into two half-subchannels. The first half-subchannel is composed of first, third and fifth tiles and the second half-subchannel is composed of second, fourth and sixth tiles. In the H-ARQ Region, the 2n-th half-subchannel is the first half-subchannel and the $(2n+1)$-th half-subchannel is the second half-subchannel of the n-th subchannel.

The H-ARQ enabled SS that receives H-ARQ DL burst at i-th frame should transmit ACK signal through the half-subchannel in the H-ARQ region at $(i+j)$-th frame. The frame offset 'j' is defined by the "H-ARQ ACK Delay for DL Burst" field in the UCD message. The half-subchannel offset in the H-ARQ Region is determined by the order of H-ARQ enabled DL burst in the H-ARQ MAP. For example, when a SS receives a H-ARQ enabled burst at i-th frame and the burst is n-th H-ARQ enabled burst in the H-ARQ MAP, the SS should transmit H-ARQ ACK at n-th half-subchannel in H-ARQ Region that is allocated by the BS at the $(i+j)$-th frame.

Table 104—~~H-ARQ~~ H-ARQ ACK Region Compact_UL-MAP IE format ~~for H-ARQ Region allocation~~

Syntax	Size	Notes
Compact_UL-MAP_IE () {		
~~UL-MAP~~ Type =4	3 bits	
H-ARQ Region Change Indication	1 bit	0: no region change 1: region changed
if (H-ARQ Region Change Indication == 1) {		
OFDMA Symbol offset	8 bits	
Subchannel offset	8 bits	
No. OFDMA Symbols	8 bits	
No. Subchannels	8 bits	
}		
}		

~~UL-MAP~~ Type
Defines the type of Compact UL-MAP. If the type value is 4, the Compact UL-MAP is for H-ARQ Region allocation.
H-ARQ Region Change Indication
Indicates whether the region for H-ARQ ACK is changed or not.
OFDMA Symbol offset
Subchannel offset
No. OFDMA Symbols
No. Subchannels

Specify the start symbol offset, the start subchannel offset, the number of allocated symbols and the number of subchannels for the H-ARQ acknowledgement region respectively.

6.3.2.3.43.7.6 CQI Region Compact UL-MAP IE ~~for CQI Region allocation~~

The CQI region information is delivered through the Compact_UL-MAP_IE as shown in Table 105. SS sends CQI report in CQI region.

Table 105—~~H-ARQ~~ CQI Region Compact_UL-MAP IE format ~~for CQI Region allocation~~

Syntax	Size	Notes
Compact_UL-MAP_IE () {		
~~UL-MAP~~ Type =5	3 bits	
CQI Region Change Indication	1 bit	0: no region change 1: region changed
if (CQI Region Change Indication == 1) {		
OFDMA Symbol offset	8 bits	
Subchannel offset	8 bits	
No. OFDMA Symbols	8 bits	
No. Subchannels	8 bits	
}		
}		

~~UL-MAP~~ Type
Defines the type of Compact UL-MAP. If the type value is 5, the Compact UL-MAP is for CQI Region allocation.
CQI Region Change Indication
Indicates whether the region for CQI is changed or not.
OFDMA Symbol offset
Subchannel offset
No. OFDMA Symbols
No. Subchannels
Specify the start symbol offset, the start subchannel offset, the number of allocated symbols and the number of subchannels for the CQI report region respectively.

6.3.2.3.43.7.7 Extension Compact UL-MAP IE ~~for extension~~

~~The format of Compact UL-MAP IE for extension is presented in Table 106.~~

Table 106—~~H-ARQ~~ Extension Compact_UL-MAP IE format ~~for extension~~

Syntax	Size	Notes
Compact_UL-MAP_IE () {		
~~UL-MAP~~ Type =7	3 bits	
UL-MAP sub-type	5 bits	Extension sub type
Length	4 bits	Length of the IE in Bytes
Payload	*variable*	Sub-type dependent payload
}		

~~UL-MAP~~ Type
This value specifies the type of the ~~compact~~ Compact UL-MAP IE. A value of 7 indicates the extension type.
UL-MAP Sub-Type
This value specifies the sub-type of the ~~compact~~ Compact UL-MAP IE.
Length
This indicates the length of this IE in Bytes. If a SS can't recognize the UL-MAP Sub-Type, it skips the IE.
Payload

The payload depends on the value of UL-MAP Sub-Type. The length of payload is Length -1 bytes.