

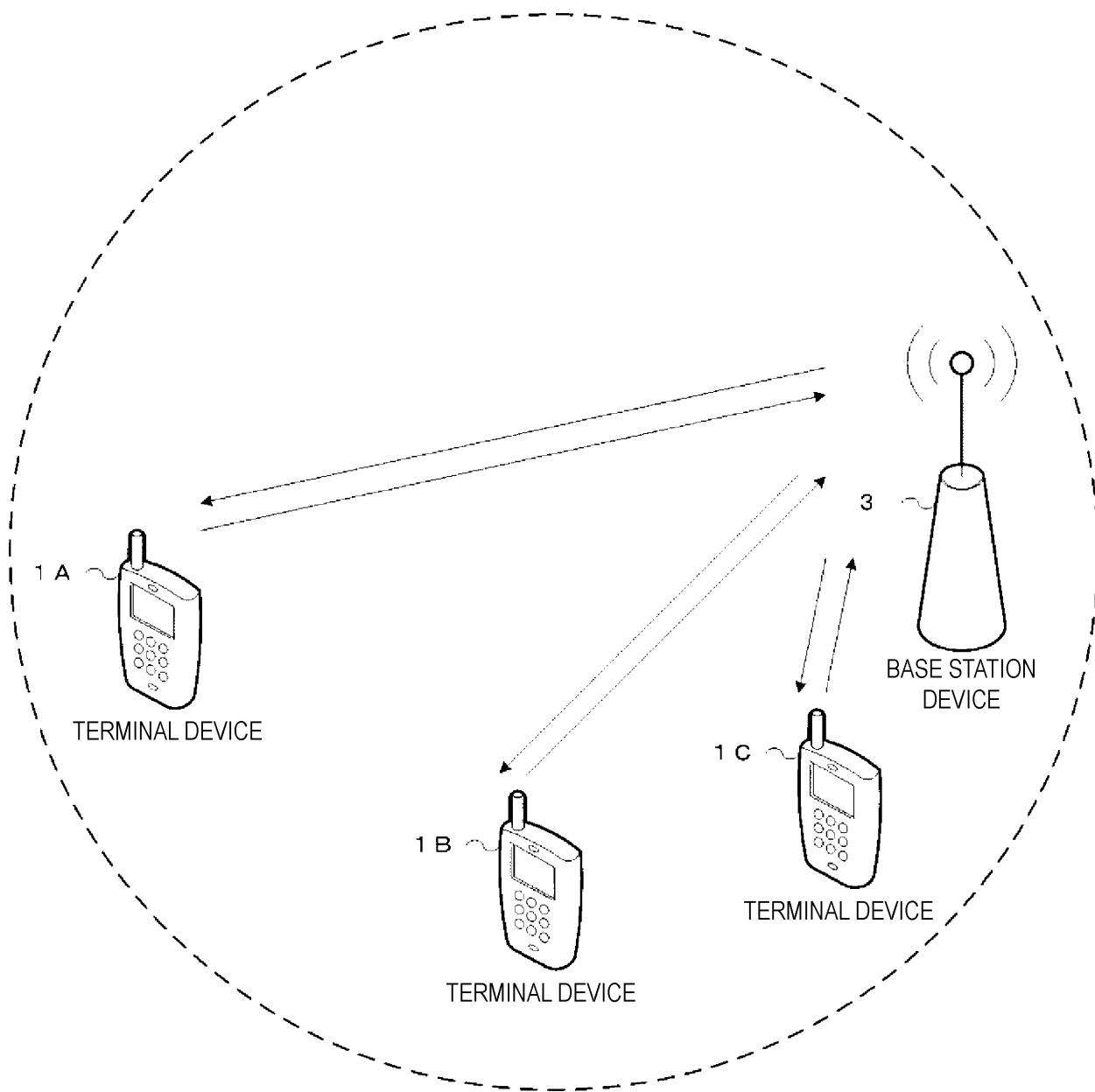


FIG. 1

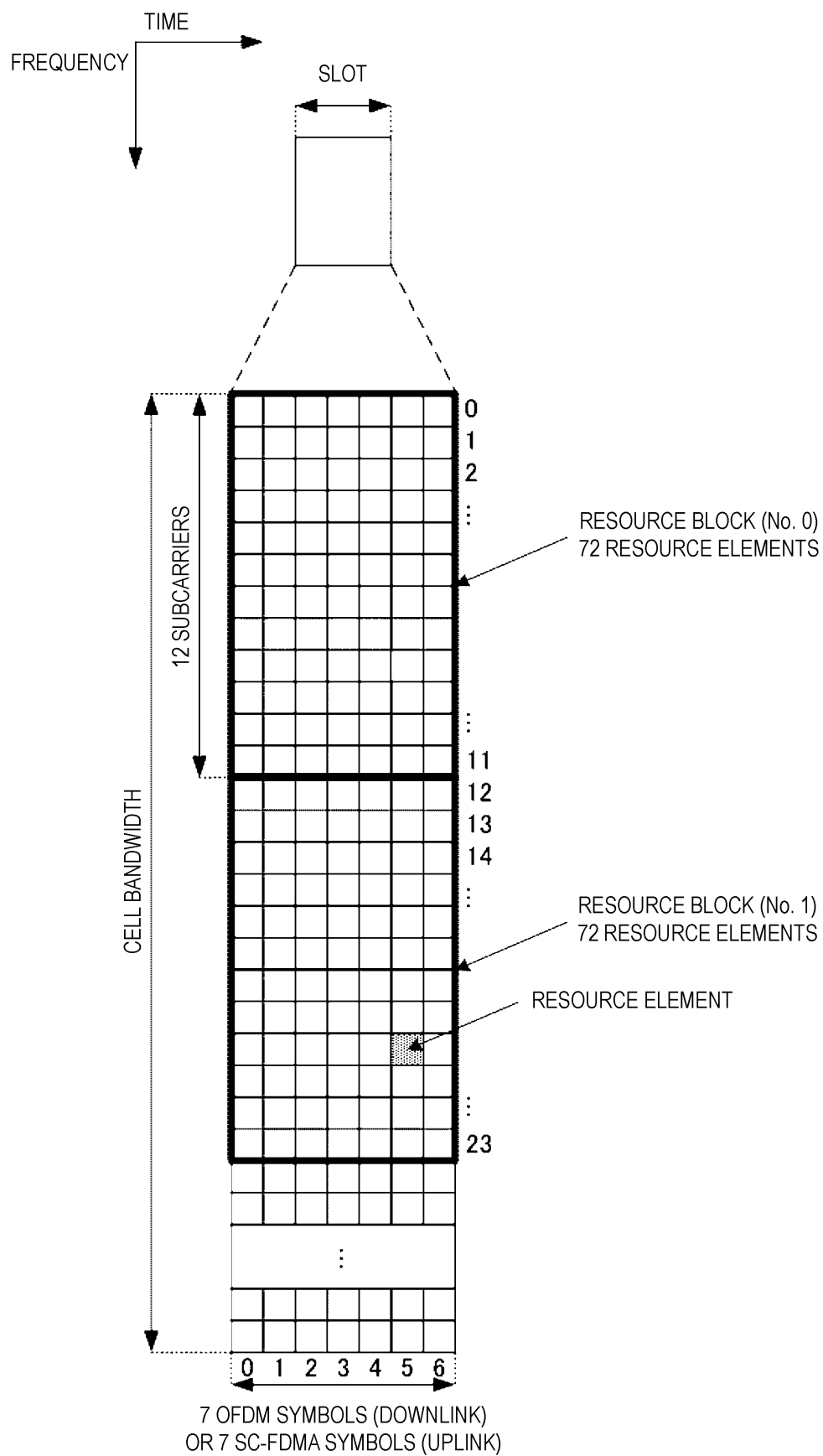


FIG. 2

FIG. 3A Example 1

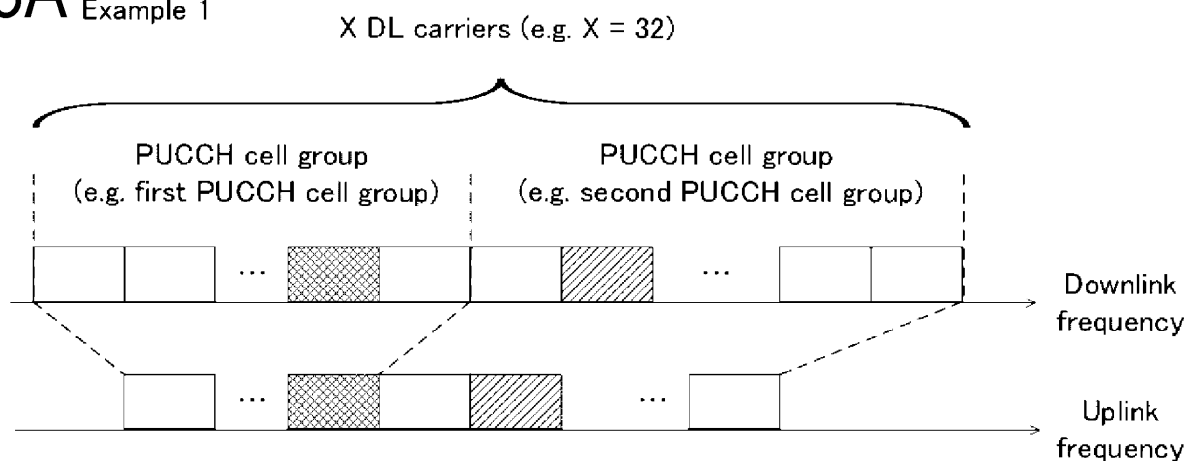


FIG. 3B Example 2

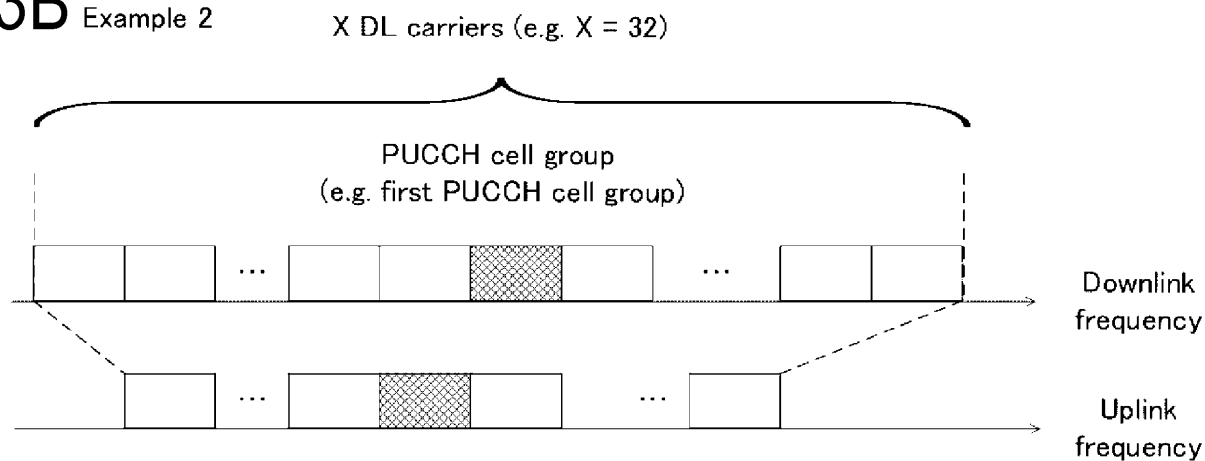
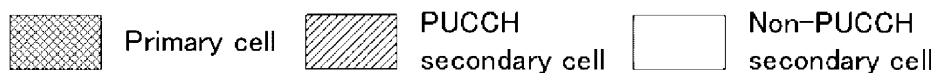
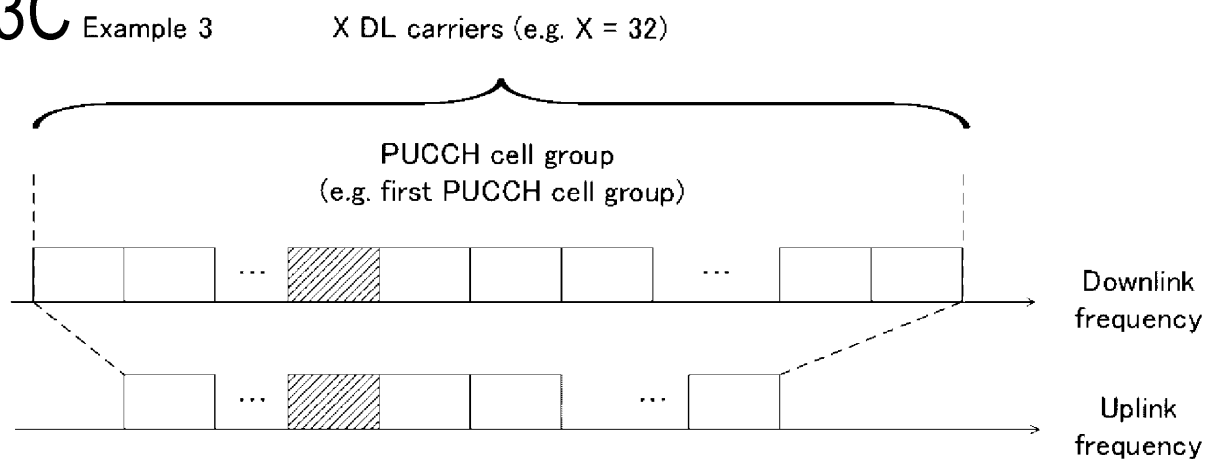


FIG. 3C Example 3



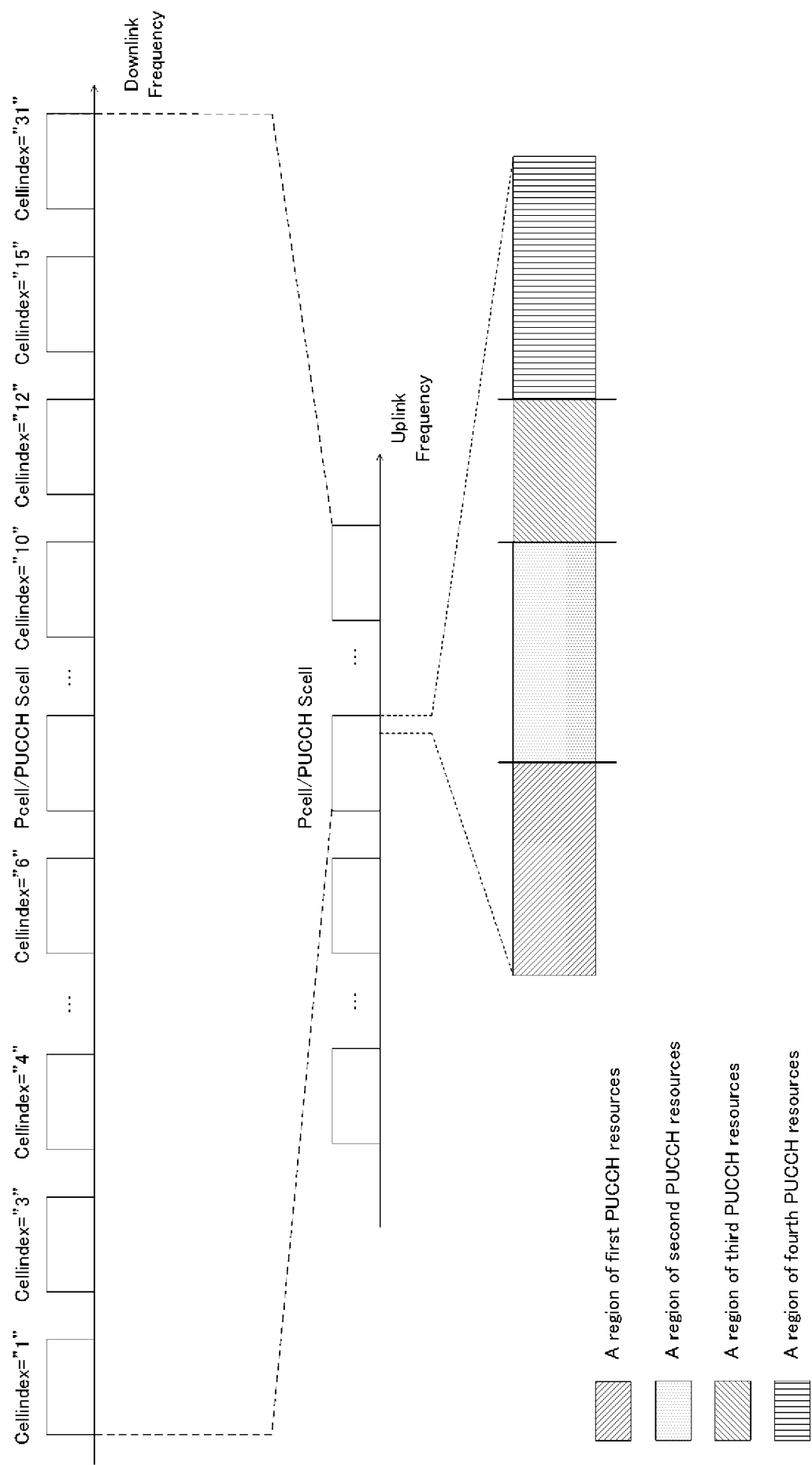


FIG. 4

SECOND PREDETERMINED VALUE									
Cell index	"0"	"1"	"3"	"4"	"6"	"10"	"12"	"15"	"31"
	2 bits	1 bits	2 bits	1 bit	2bit	1 bit	2 bits	1 bit	1 bit
	2 bits	3 bits	5 bits	6 bits	8 bits	9 bits	11 bits	13 bits	14 bits
FIRST PREDETERMINED VALUE									
THIRD PREDETERMINED VALUE (e.g. 10 bits)									
The result of concatenation of HARQ-ACK bits									

FIG. 5

The sequence of bits $\tilde{o}_0^{ACK}, \tilde{o}_1^{ACK}, \dots, \tilde{o}_{O^{ACK}-1}^{ACK}$ is the result of the concatenation of HARQ-ACK bits for different cells according to the following pseudo-code:

Set $c = 0$ -- cell index: lower indices correspond to lower RRC indices of corresponding cell

Set $j = 0$ -- HARQ-ACK bit index

Set N_{cells}^{DL} to the number of cells configured by higher layers for the UE

while $c < N_{cells}^{DL}$

if transmission mode configured in cell $c \in \{1, 2, 5, 6, 7\}$ -- 1 bit HARQ-ACK feedback for this cell

$\tilde{o}_j^{ACK} = \text{HARQ-ACK bit of this cell}$

$j = j + 1$

else

$\tilde{o}_j^{ACK} = \text{HARQ-ACK bit corresponding to the first codeword of this cell}$

$j = j + 1$

$\tilde{o}_j^{ACK} = \text{HARQ-ACK bit corresponding to the second codeword of this cell}$

$j = j + 1$

end if

$c = c + 1$

end while

FIG. 6

The sequence of bits $\tilde{o}_0^{ACK}, \tilde{o}_1^{ACK}, \dots, \tilde{o}_{N_{cells}-1}^{ACK}$ is the result of the concatenation of HARQ-ACK bits for different cells according to the following pseudo-code:

Set $c = 0$ – cell index: lower indices correspond to lower RRC indices of corresponding cell

Set $j = 0$ – HARQ-ACK bit index

Set N_{cells}^{DL} to the number of cells configured by higher layers for the UE

Set X to $\min \{ N_{cells}^{DL}, \text{a first value (e.g. 5 or 10)} \}$

while $c < X$

if transmission mode configured in cell $c \in \{1,2,5,6,7\}$ -- 1 bit HARQ-ACK feedback for this cell

$\tilde{o}_j^{ACK} = \text{HARQ-ACK bit of this cell}$

$j = j + 1$

else

$\tilde{o}_j^{ACK} = \text{HARQ-ACK bit corresponding to the first codeword of this cell}$

$j = j + 1$

$\tilde{o}_j^{ACK} = \text{HARQ-ACK bit corresponding to the second codeword of this cell}$

$j = j + 1$

end if

$c = c + 1$

end while

FIG. 7

The sequence of bits $\tilde{o}_0^{ACK}, \tilde{o}_1^{ACK}, \dots, \tilde{o}_{O_{UE}-1}^{ACK}$ is the result of the concatenation of HARQ-ACK bits for different cells according to the following pseudo-code:

Set $c = 0$ – cell index: lower indices correspond to lower RRC indices of corresponding cell

Set $j = 0$ – HARQ-ACK bit index

Set N_{cells}^{DL} to the number of cells configured by higher layers for the UE

Set Y to a second value (e.g. 10, or 20)

while $c < Y$

if transmission mode configured in cell $c \in \{1, 2, 5, 6, 7\}$ -- 1 bit HARQ-ACK feedback for this cell

$\tilde{o}_j^{ACK} = \text{HARQ-ACK bit of this cell}$

$j = j + 1$

else

$\tilde{o}_j^{ACK} = \text{HARQ-ACK bit corresponding to the first codeword of this cell}$

$j = j + 1$

$\tilde{o}_j^{ACK} = \text{HARQ-ACK bit corresponding to the second codeword of this cell}$

$j = j + 1$

end if

$c = c + 1$

end while

FIG. 8

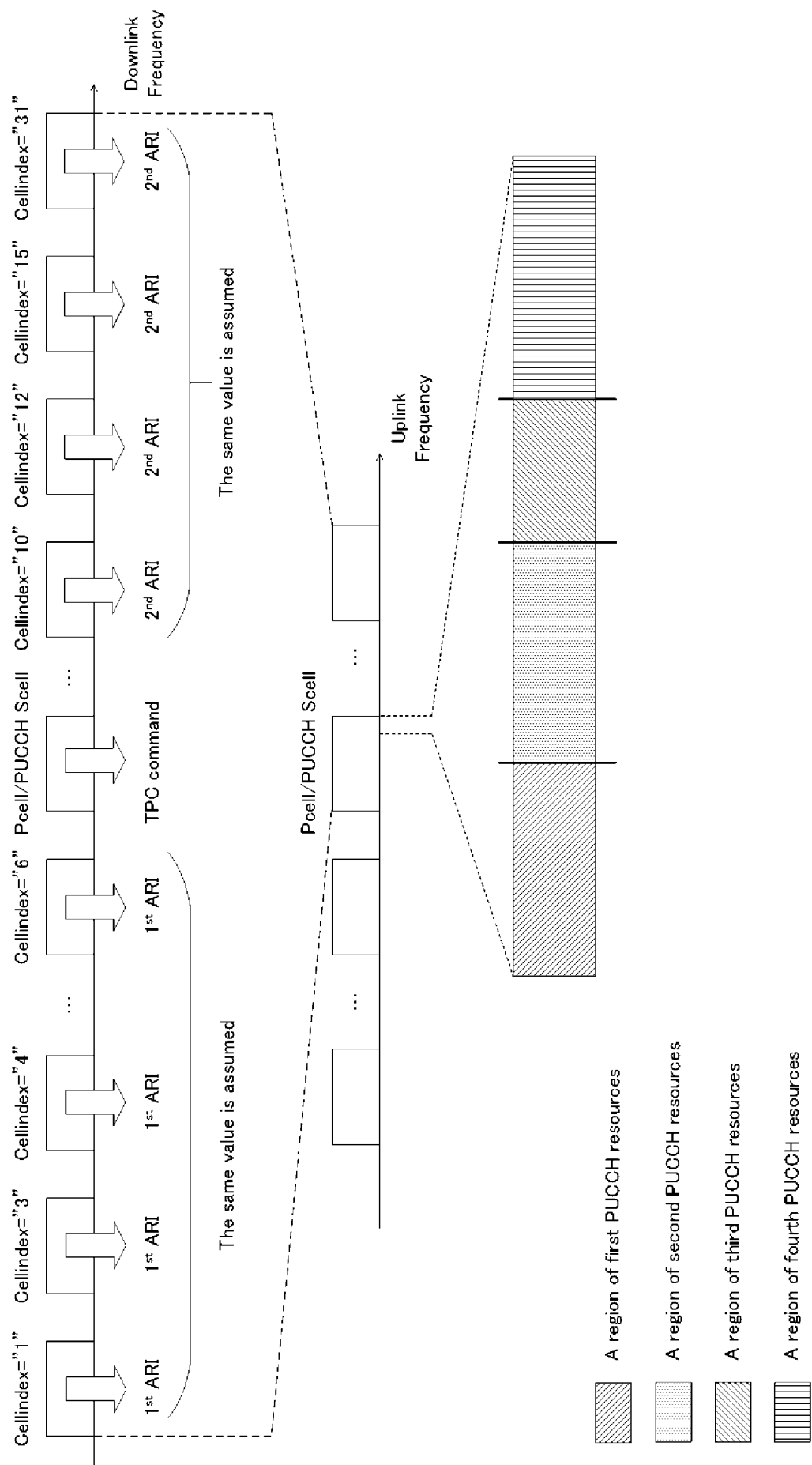


FIG. 9

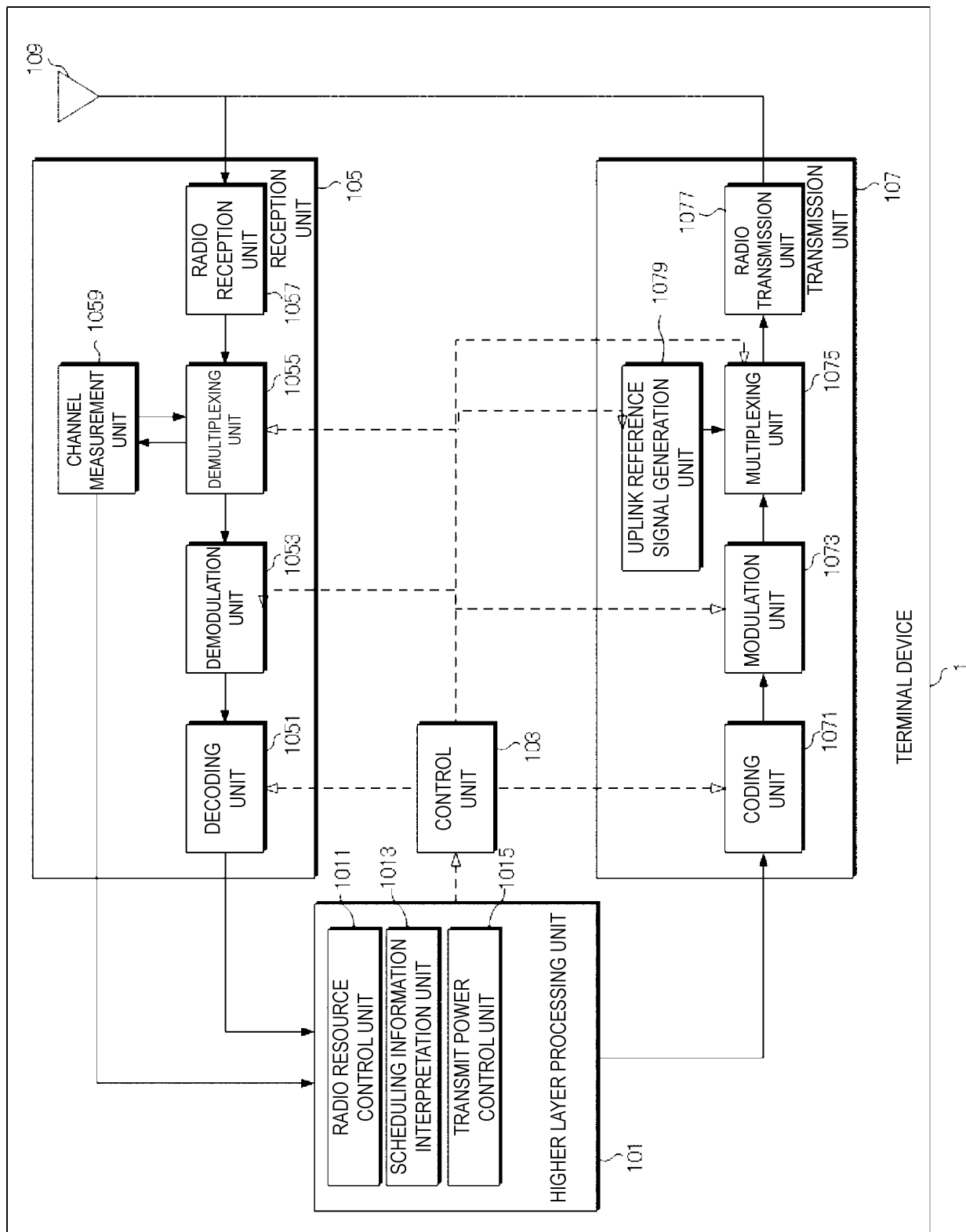


FIG. 10

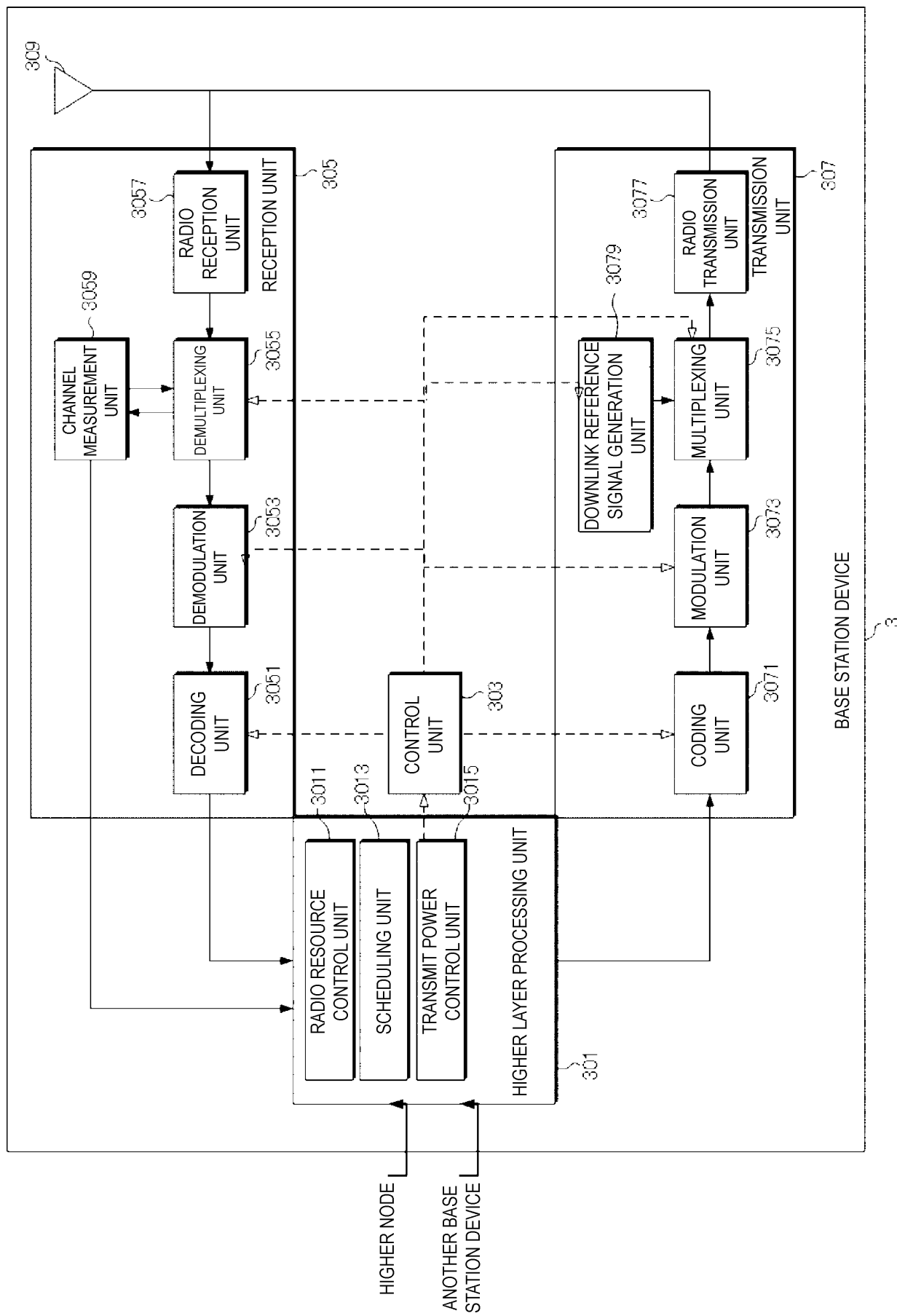


FIG. 11