

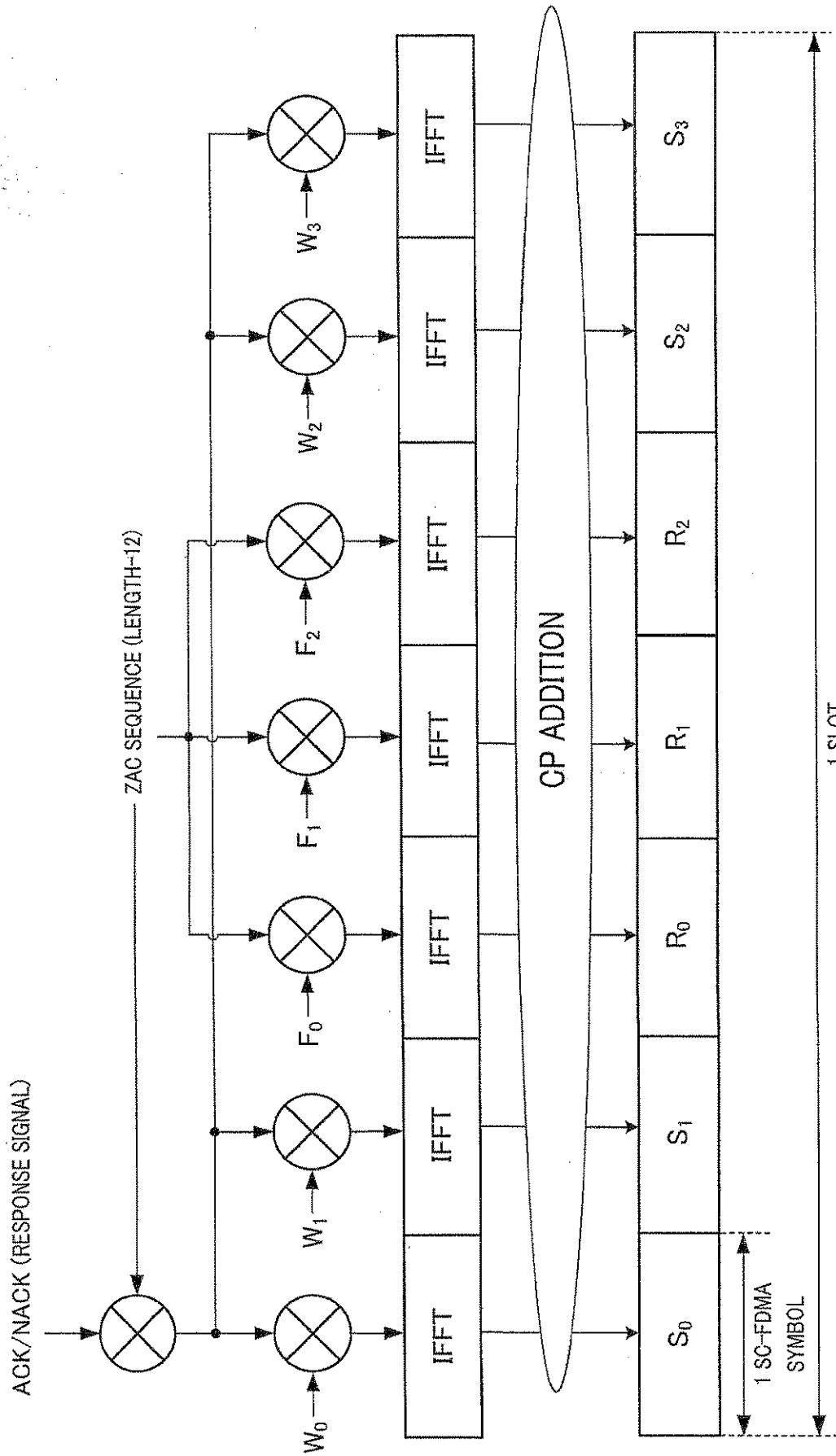


FIG. 1

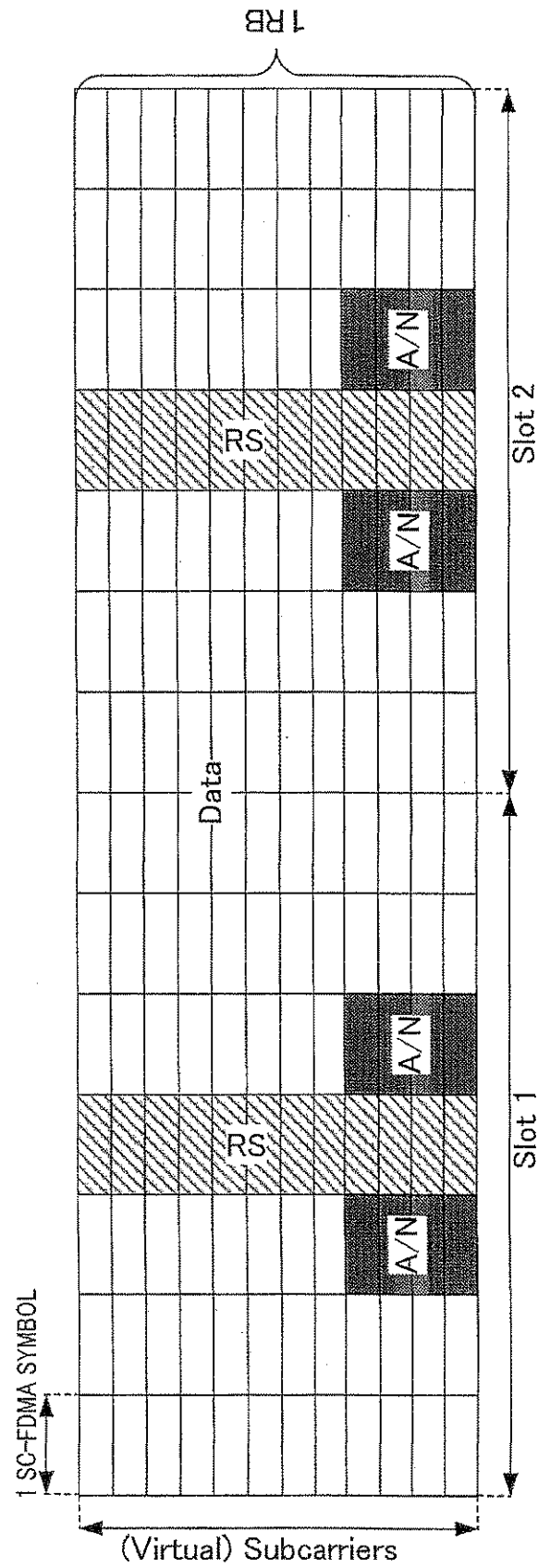


FIG. 2

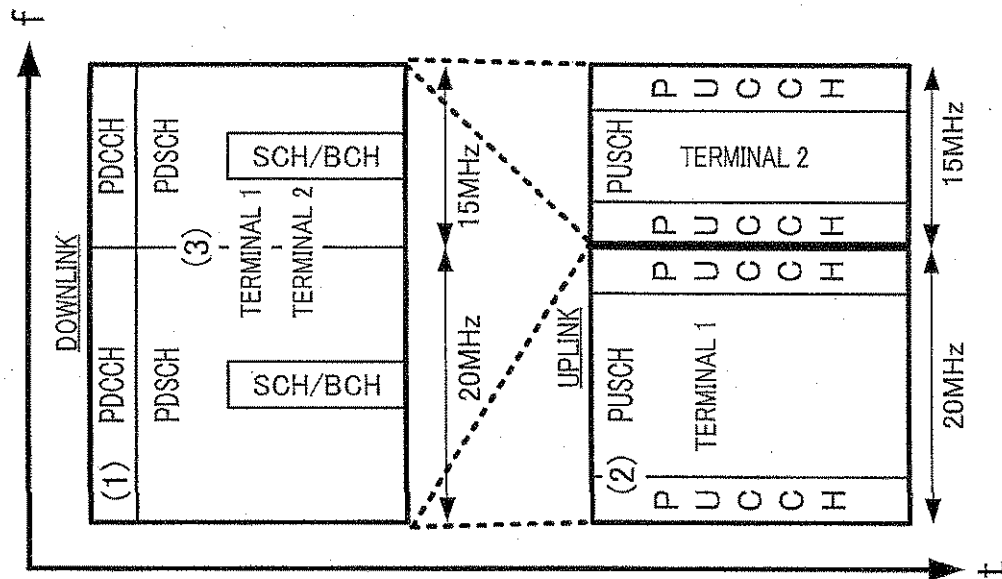


FIG. 3B

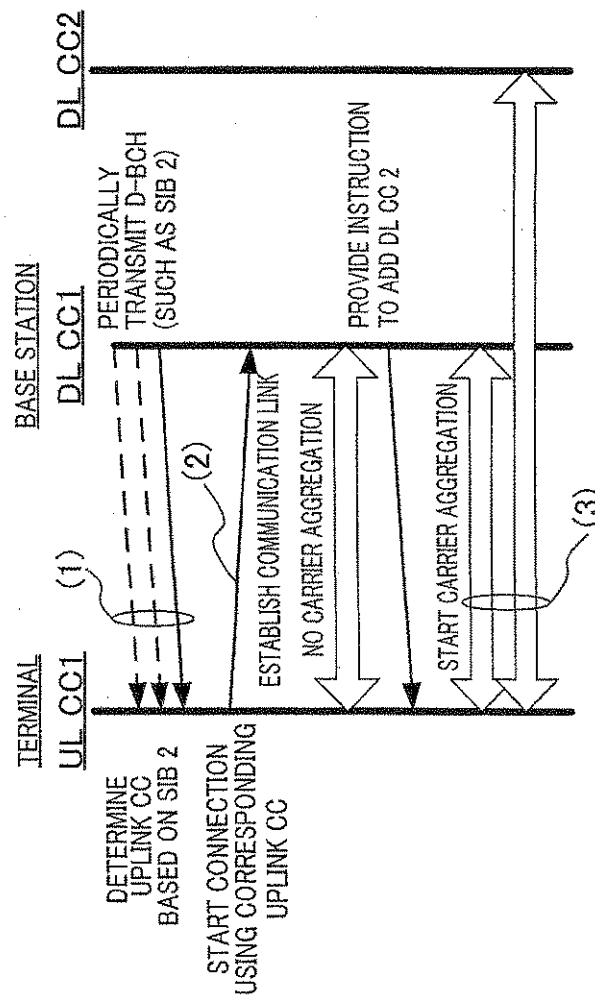


FIG. 3A

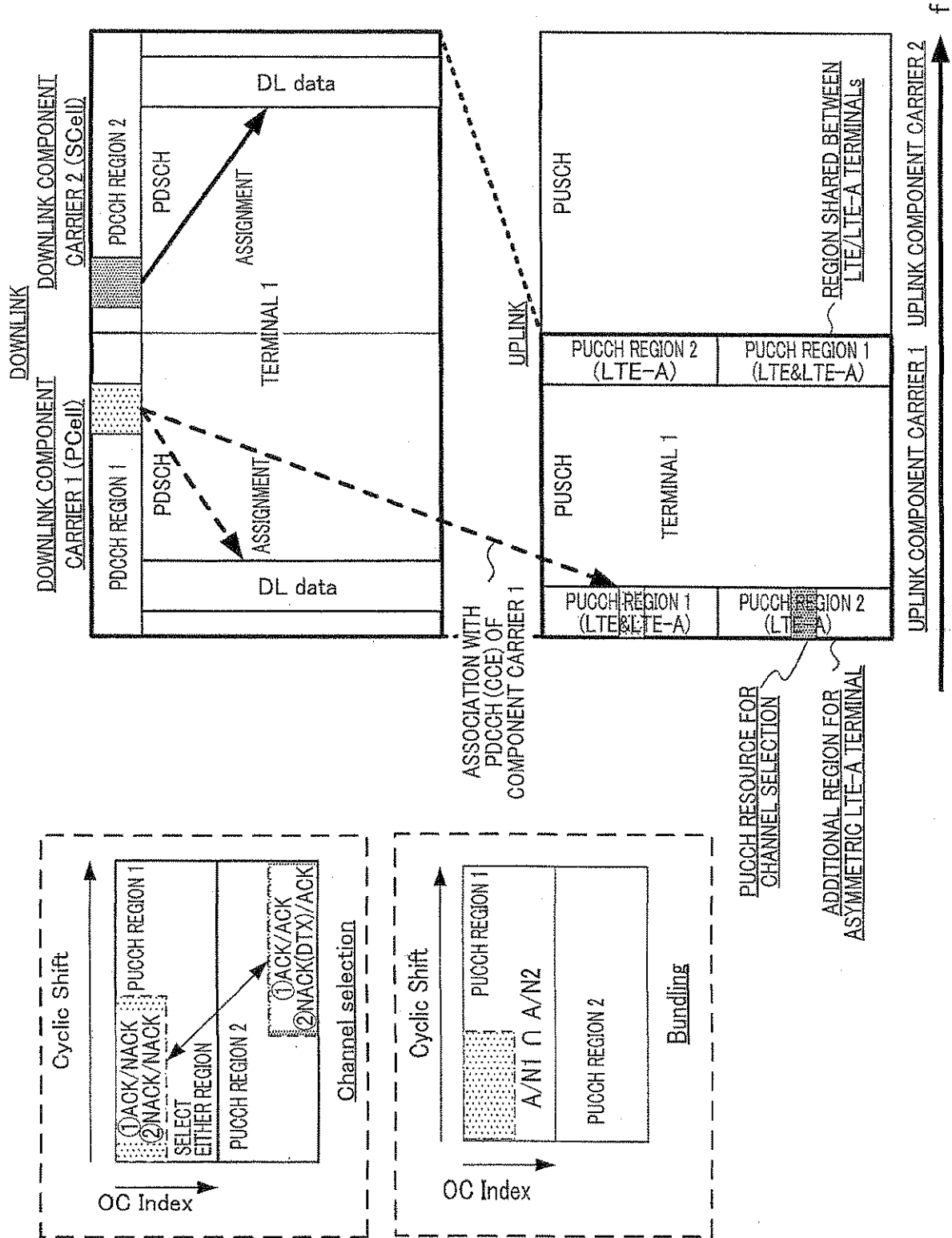


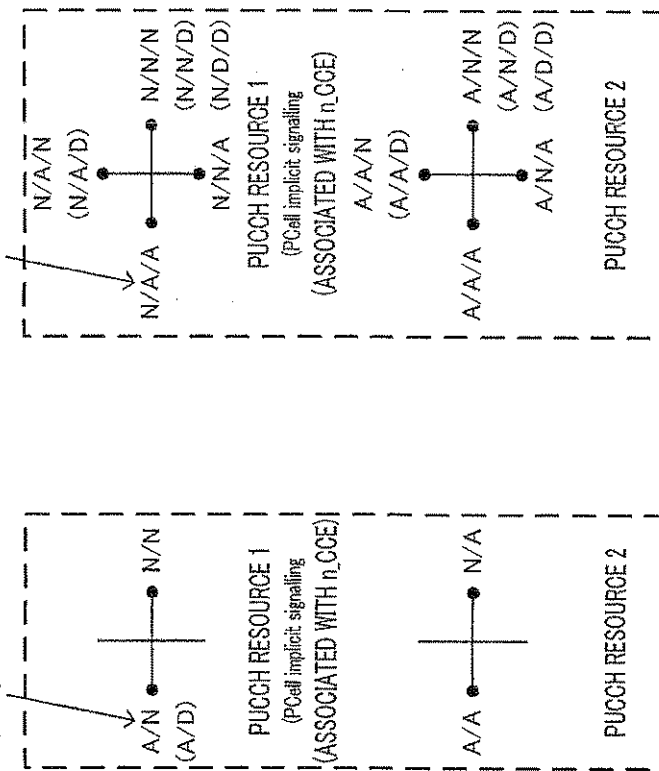
FIG. 4

PDSCH (CW0) OF PCell IS NACK,
PDSCH (CW1) OF PCell IS ACK AND
PDSCH (CW0) OF SCell IS ACK

OR

PDSCH (CW0) OF PCell IS NACK,
PDSCH (CW0) OF SCell IS ACK AND
PDSCH (CW1) OF SCell IS ACK

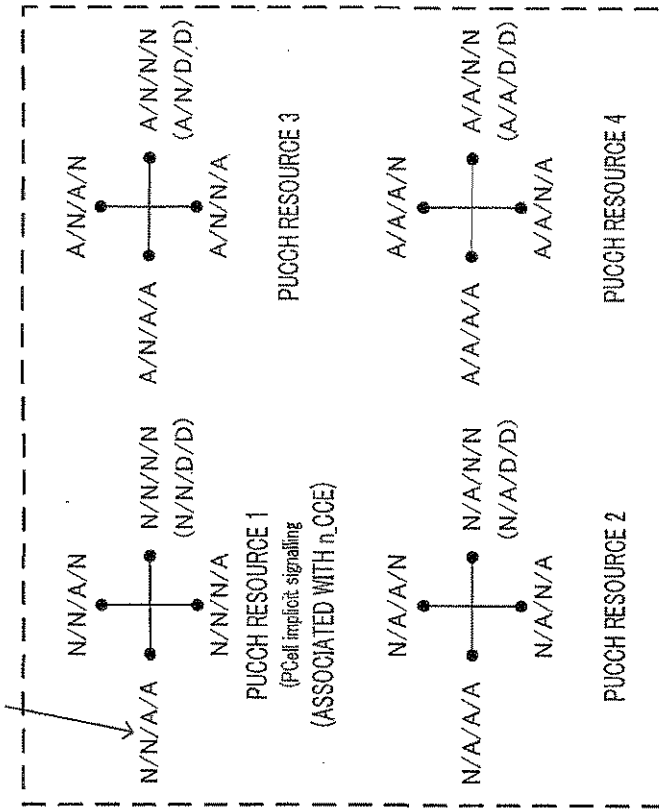
PDSCH (CW0) OF PCell IS ACK AND
PDSCH (CW0) OF SCell IS NACK



TWO DOWNLINK COMPONENT
CARRIERS AND SINGLE CW PER
DOWNLINK COMPONENT CARRIER

FIG. 5A

PDSCH (CW0) OF PCell IS NACK,
PDSCH (CW1) OF PCell IS NACK,
PDSCH (CW0) OF SCell IS ACK, AND
PDSCH (CW1) OF SCell IS ACK



TWO DOWNLINK COMPONENT CARRIERS AND
TWO CWs PER DOWNLINK COMPONENT CARRIER

FIG. 5B

FIG. 5C

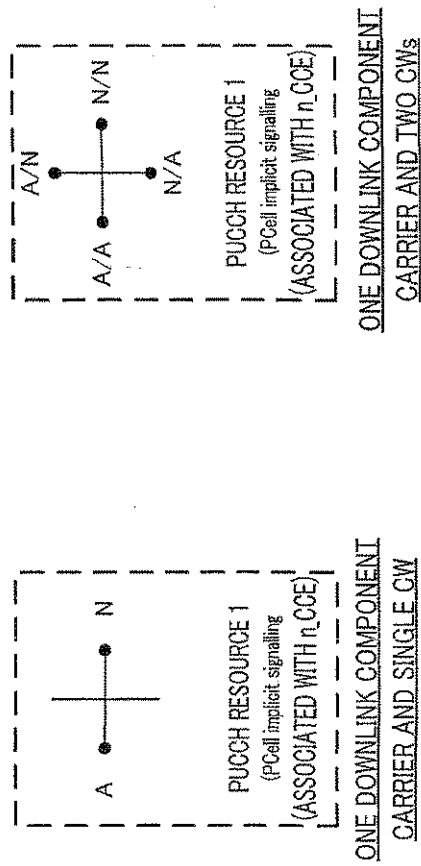


FIG. 6A

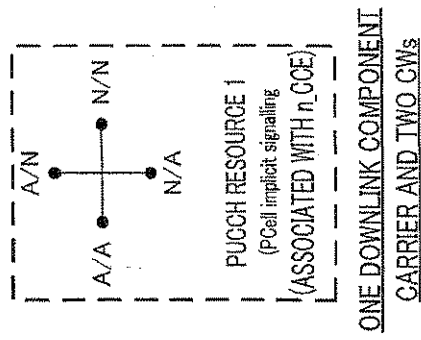


FIG. 6B

Table 5-1: 2 ACK/NAK Bits

	Ch1		Ch2	
	RS	Data	RS	Data
N, N	1	1	0	0
A, N	1	-j	0	0
N, A	0	0	1	1
A, A	0	0	1	-1

- Data applied to SC-FDMA symbols 0, 1, 5, 6
- RS applied to SC-FDMA symbols 2, 3, 4
- Repeated transmission in two slots

Table 5-2: 3 ACK/NAK Bits

	Ch1		Ch2	
	RS	Data	RS	Data
N, N, N	1	1	0	0
N, N, A	1	-j	0	0
N, A, N	1	j	0	0
N, A, A	1	-1	0	0
A, N, N	0	0	1	1
A, N, A	0	0	1	-j
A, A, N	0	0	1	j
A, A, A	0	0	1	-1

FIG. 7

Table 6: 4 ACK/NAK Bits

	Ch 1		Ch 2		Ch 3		Ch 4	
	RS	Data	RS	Data	RS	Data	RS	Data
N,N,N,N	1	1	0	0	0	0	0	0
N,N,N,A	1	-j	0	0	0	0	0	0
N,N,A,N	1	j	0	0	0	0	0	0
N,N,A,A	1	-1	0	0	0	0	0	0
N,A,N,N	0	0	1	1	0	0	0	0
N,A,N,A	0	0	1	-j	0	0	0	0
N,A,A,N	0	0	1	j	0	0	0	0
N,A,A,A	0	0	1	-1	0	0	0	0
A,N,N,N	0	0	0	0	1	1	0	0
A,N,N,A	0	0	0	0	1	-j	0	0
A,N,A,N	0	0	0	0	1	j	0	0
A,N,A,A	0	0	0	0	1	-1	0	0
A,A,N,N	0	0	0	0	0	0	1	1
A,A,N,A	0	0	0	0	0	0	1	-j
A,A,A,N	0	0	0	0	0	0	1	j
A,A,A,A	0	0	0	0	0	0	1	-1

FIG. 8

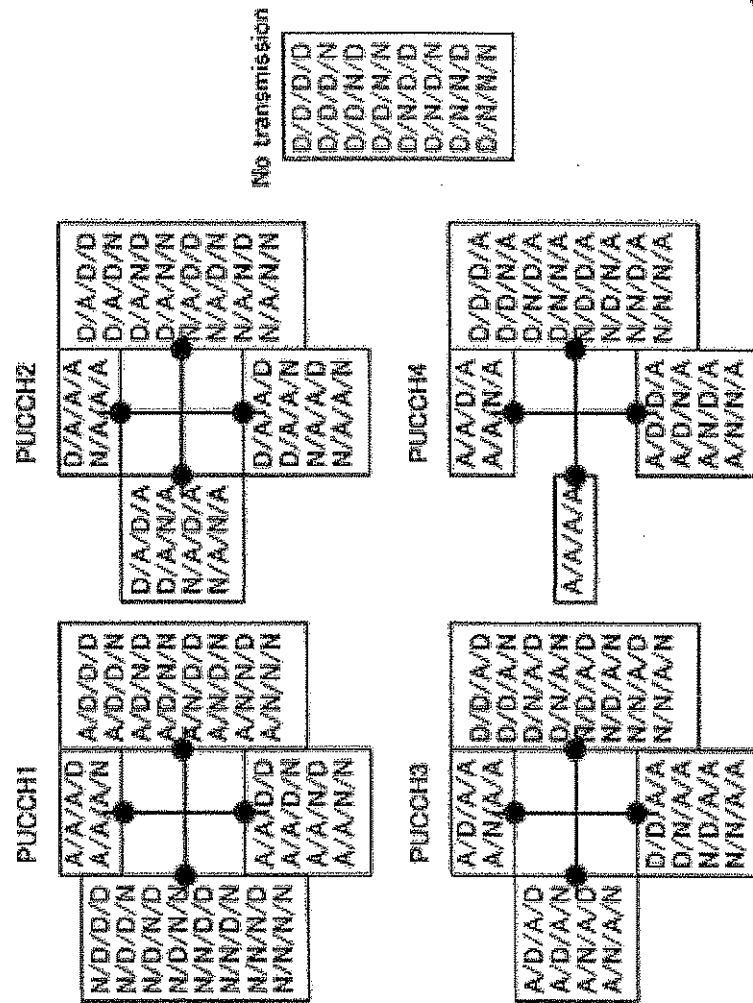


Figure 5 Mapping rules in case that four DL CCs are configured (Alternative 1-2)

FIG. 9

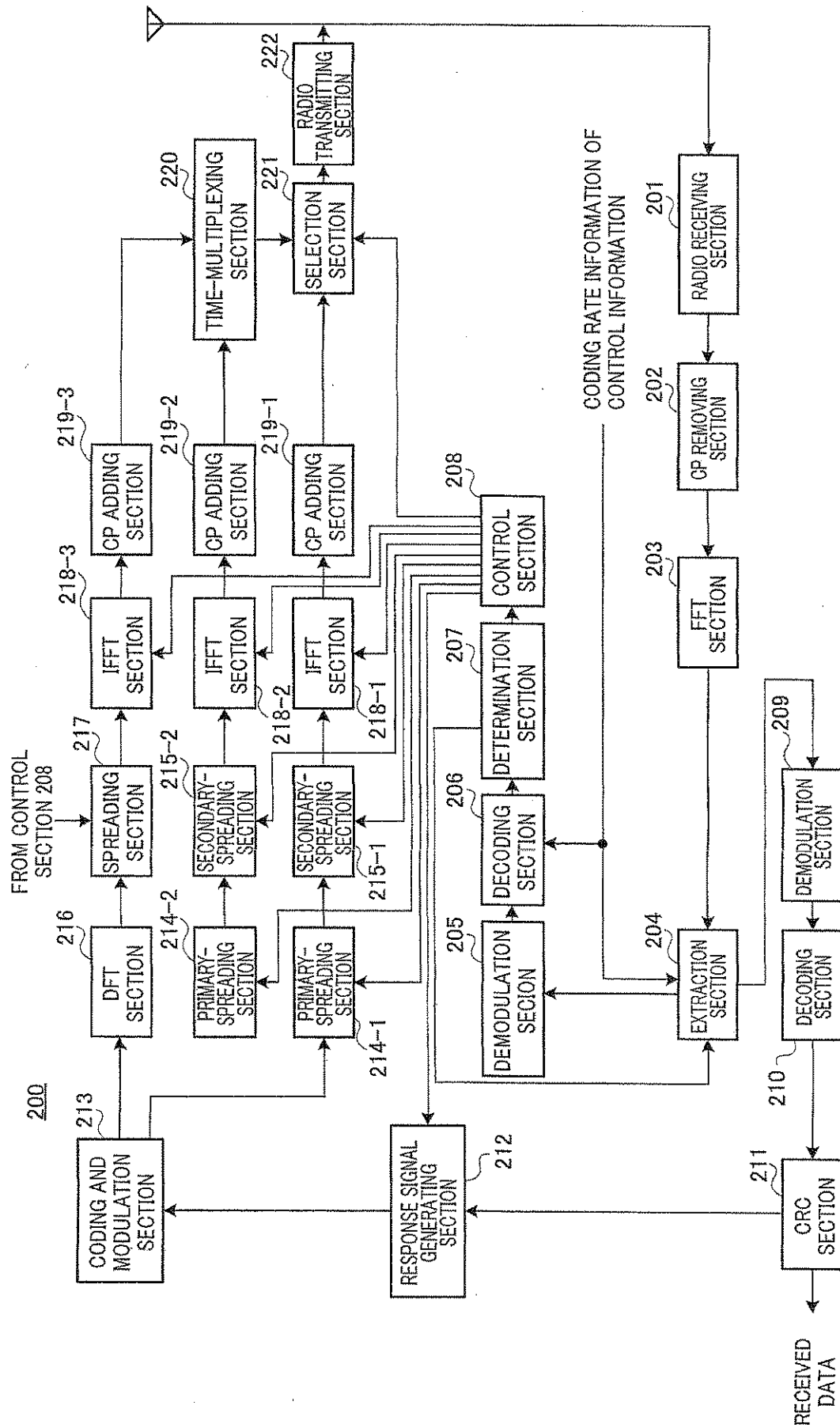


FIG. 11

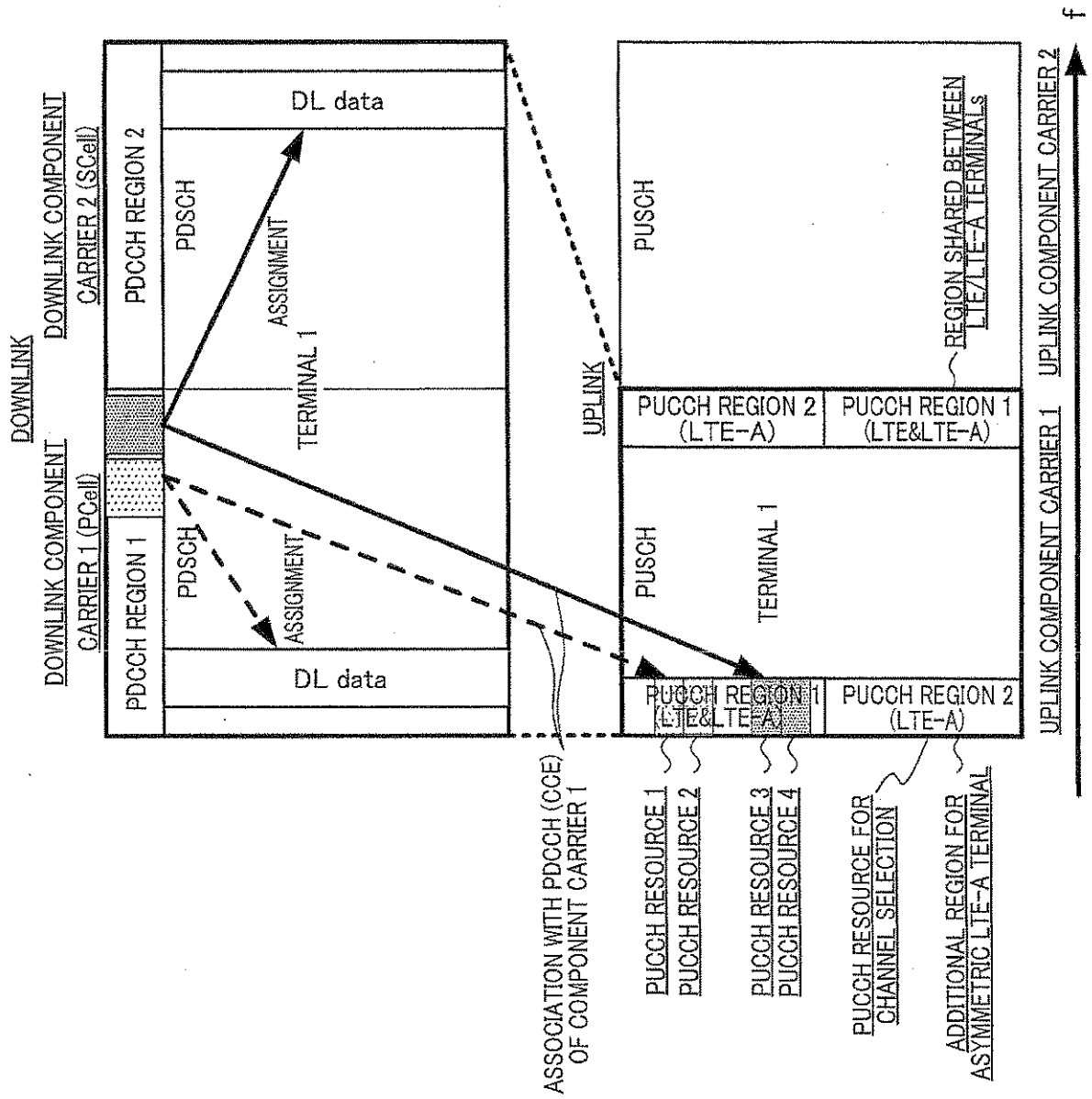


FIG. 12

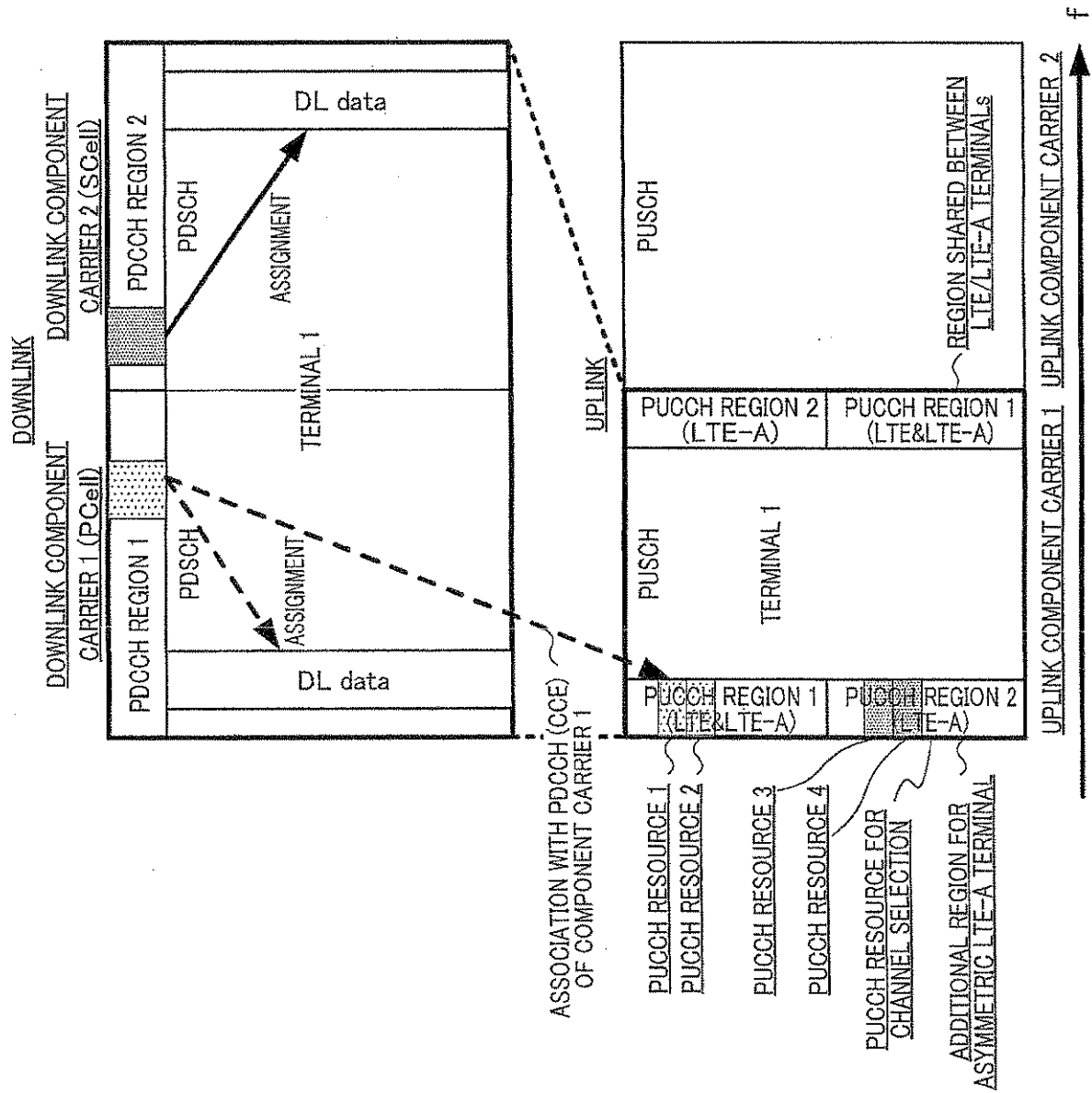


FIG. 13

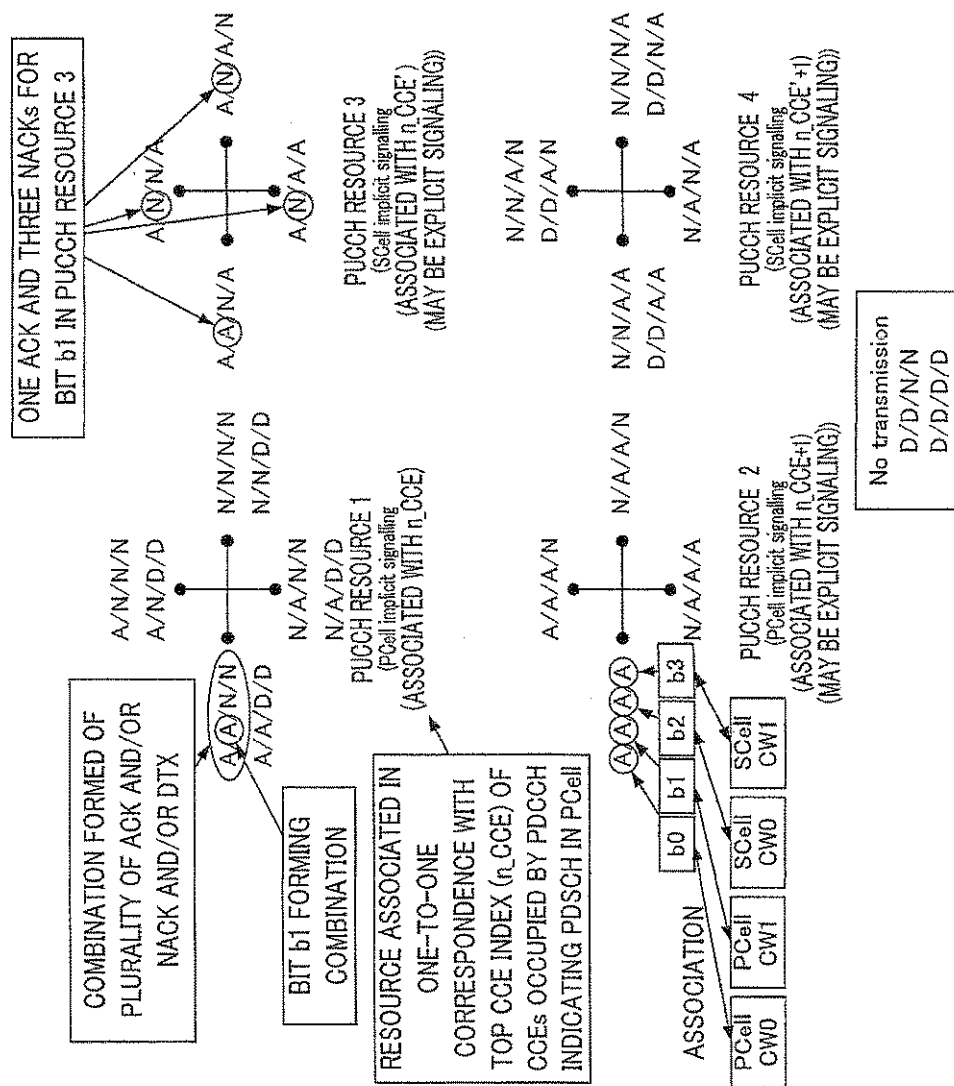


FIG. 14A

14/36

ONE ACK AND THREE NACKs FOR BIT b1 IN PUCCH RESOURCE 3

NUMBER OF COMBINATIONS FOR A/N=1:0 OR 0:1

	PUCCH RESOURCE				CONCENTRATION OF A/N
	1	2	3	4	
b0	A	2	2	4	8
b1	A	2	2	4	8
b2	A	2	2	4	8
b3	A	2	2	4	8
Rel-8 fallback	0	1	2	3	FALLBACK TO FORMAT 1b

THERE IS ALWAYS CONCENTRATION OF ACKs OR NACKs FOR EACH BIT IN AT LEAST ONE PUCCH RESOURCE

FIG. 14B

PCell	SCell	PUCH RESOURCE			
		1	2	3	4
A,A	A,A		-1		
A,N	A,A			-j	
N,A	A,A		-j		
N,N	A,A				-1
A,A	A,N		j		
A,N	A,N			1	
N,A	A,N		1		
N,N	A,N				j
A,A	N,A			-1	
A,N	N,A			j	
N,A	N,A				-j
N,N	N,A				1
A,A	N,N	-1			
A,N	N,N	j			
N,A	N,N	-j			
N,N	N,N	1			
A,A	D,D	-1			
A,N	D,D	j			
N,A	D,D	-j			
N,N	D,D	1			
D,D	A,A				-1
D,D	A,N				j
D,D	N,A				1
D,D	N,N	No transmission			
D,D	D,D	No transmission			

FIG. 15

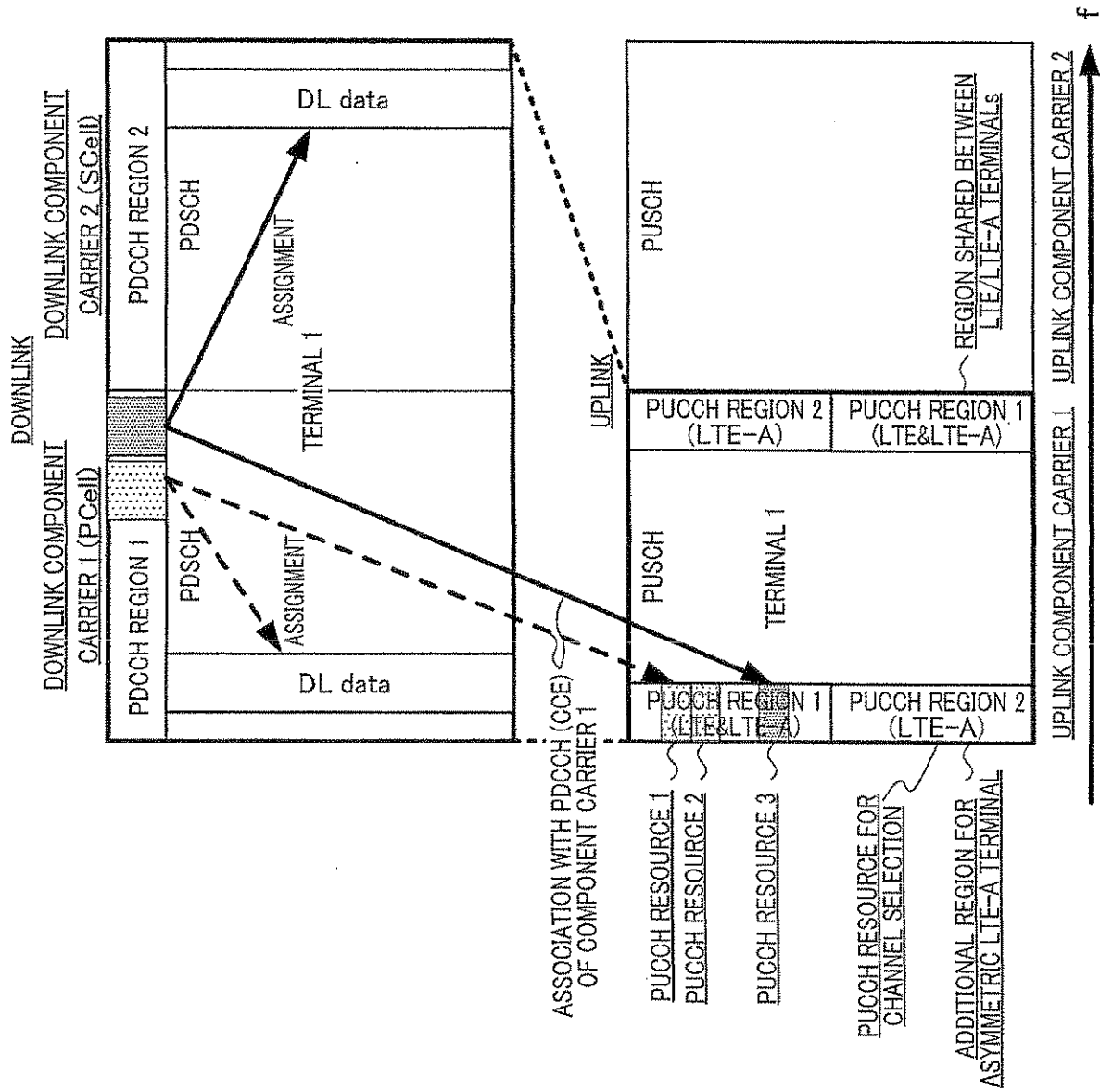


FIG. 16

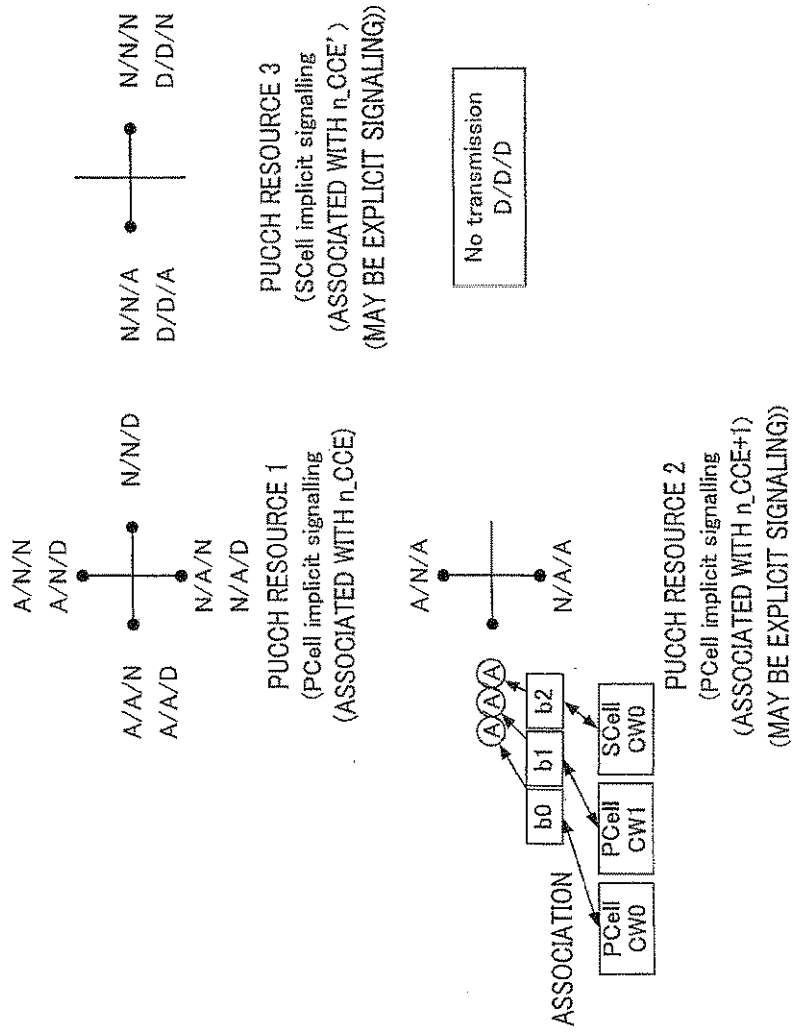


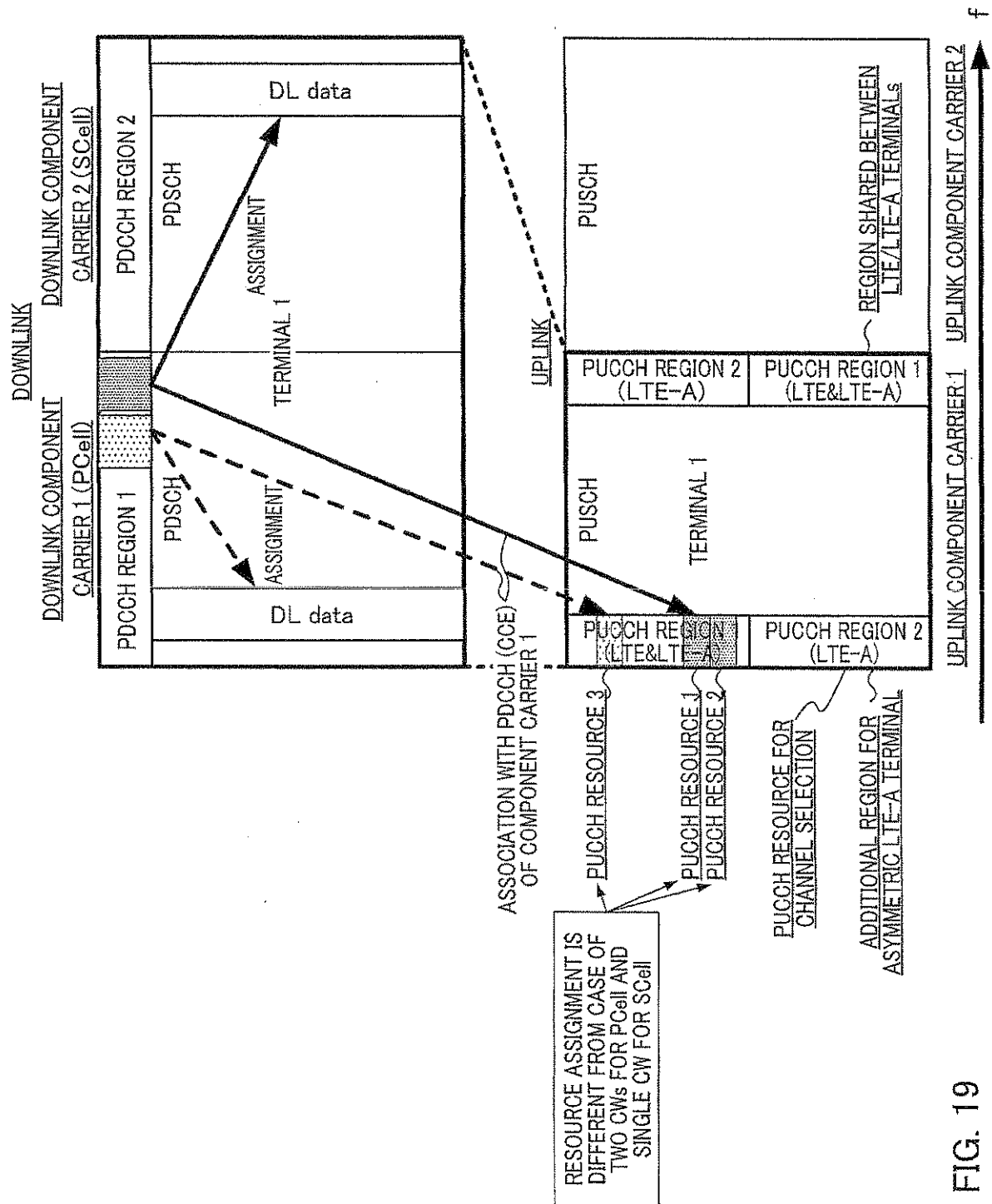
FIG. 17A

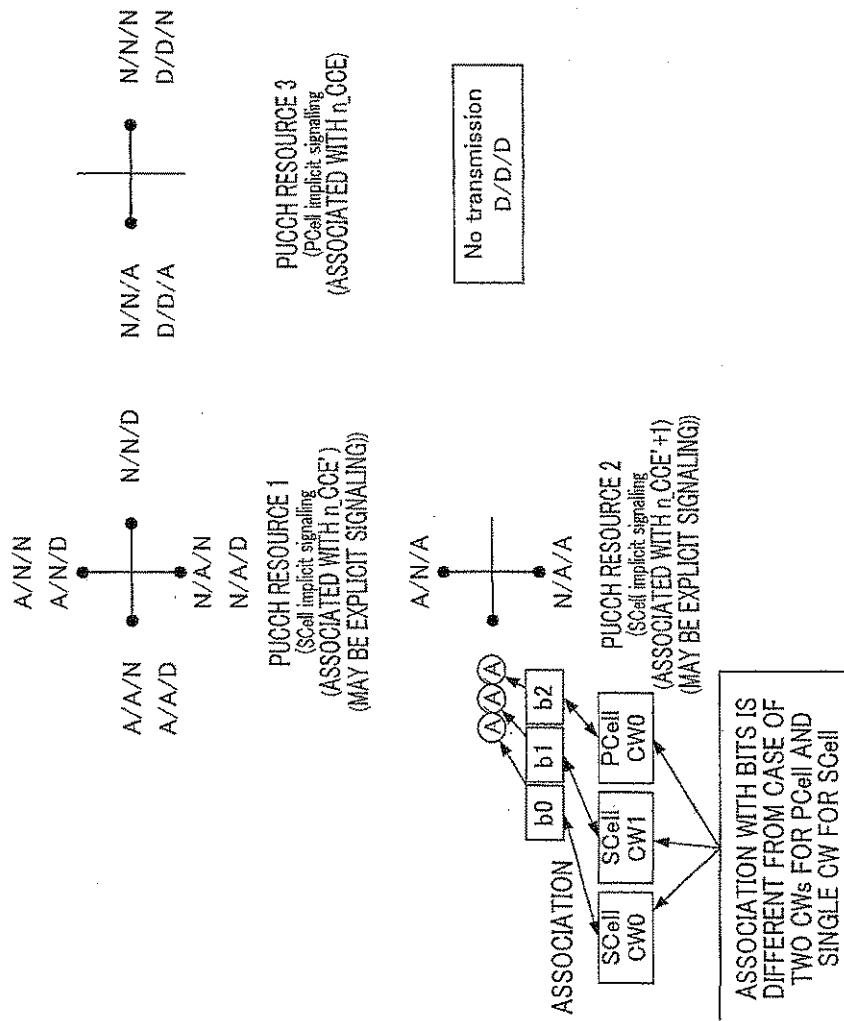
		PUCCH RESOURCE				CONCENTRATION OF A/N
		1	2	3		
b0	A	2	2	0	1	
	N	2	1	2		
b1	A	2	2	0	1	
	N	2	1	2		
b2	A	0	3	1	2	
	N	3	0	1		
Rel-8 fallback						
Rel-8 fallback					FALLBACK TO FORMAT 1b	

FIG. 17B

SDM Cell	non-SDM Cell	PUCCH RESOURCE		
		1	2	3
A,A	A		-1	
A,N	A		j	
N,A	A		-j	
N,N	A			-1
A,A	N	-1		
A,N	N	j		
N,A	N	-j		
N,N	N			1
A,A	D	-1		
A,N	D	j		
N,A	D	-j		
N,N	D	1		
D,D	A			-1
D,D	N			1
D,D	D	No transmission		

FIG. 18





NUMBER OF COMBINATIONS
FOR A:N=1:0 OR 0:1

	PUCCH RESOURCE						CONCENTRATION OF A/N
	1	2	3				
b0	A	2	2	0		1	3
	N	2	1	2			
b1	A	2	2	0		1	3
	N	2	1	2			
b2	A	0	3	1		2	6
	N	3	0	1			
Rel-8 fallback	x	x	x	0		FALLBACK TO FORMAT 1a	

FORMAT TO WHICH FALLBACK IS MADE IS DIFFERENT FROM CASE OF TWO CWs FOR PCell AND SINGLE CW FOR SCell

FIG. 20B

SDM Cell	non-SDM Cell	PUCCH RESOURCE		
		1	2	3
A,A	A		-1	
A,N	A		j	
N,A	A		-j	
N,N	A			-1
A,A	N	-1		
A,N	N	j		
N,A	N	-j		
N,N	N			1
A,A	D	-1		
A,N	D	j		
N,A	D	-j		
N,N	D	1		
D,D	A			-1
D,D	N			1
D,D	D	No transmission		

FIG. 21

SDM Cell	non-SDM Cell	PUCCH RESOURCE		
		1	2	3
A,A	A	-1		
A,N	A	1		
N,A	A		-1	
N,N	A			-1
A,A	N		1	
A,N	N		j	
N,A	N		-j	
N,N	N			1
A,A	D		1	
A,N	D		j	
N,A	D		-j	
N,N	D	No transmission		
D,D	A			-1
D,D	N			1
D,D	D	No transmission		

FIG. 23

PCell	SCell	PUCCH resource	
		1	2
A	A		1
A	N	-1	
N	A		-1
N	N	1	
D	A		-1
D	N	No transmission	
A	D	-1	
N	D	1	
D	D	No transmission	

FIG. 24

SDM Cell	non- SDM	PUCCH resource		
		1	2	3
A,A	A		-1	
A,N	A		j	
N,A	A		-j	
N,N	A			-1
A,A	N	-1		
A,N	N	j		
N,A	N	-j		
N,N	N			1
A,A	D	-1		
A,N	D	j		
N,A	D	-j		
N,N	D	1 if PCell is SDM configured, No transmission if PCell is non-SDM configured		
D,D	A			-1
D,D	N			1 if PCell is SDM configured No transmission if PCell is non-SDM configured
D,D	D	No transmission		

FIG. 25

PCell	SCell	PUCCH resource			
		1	2	3	4
A,A	A,A		-1		
A,N	A,A				-j
N,A	A,A		-j		
N,N	A,A			-1	
A,A	A,N		j		
A,N	A,N				1
N,A	A,N		1		
N,N	A,N			j	
A,A	N,A				-1
A,N	N,A				j
N,A	N,A			1	
N,N	N,A			-j	
A,A	N,N	-1			
A,N	N,N	j			
N,A	N,N	-j			
N,N	N,N	1			
A,A	D,D	-1			
A,N	D,D	j			
N,A	D,D	-j			
N,N	D,D	1			
D,D	A,A			-1	
D,D	A,N			j	
D,D	N,A			-j	
D,D	N,N	No transmission			
D,D	D,D	No transmission			

FIG. 26

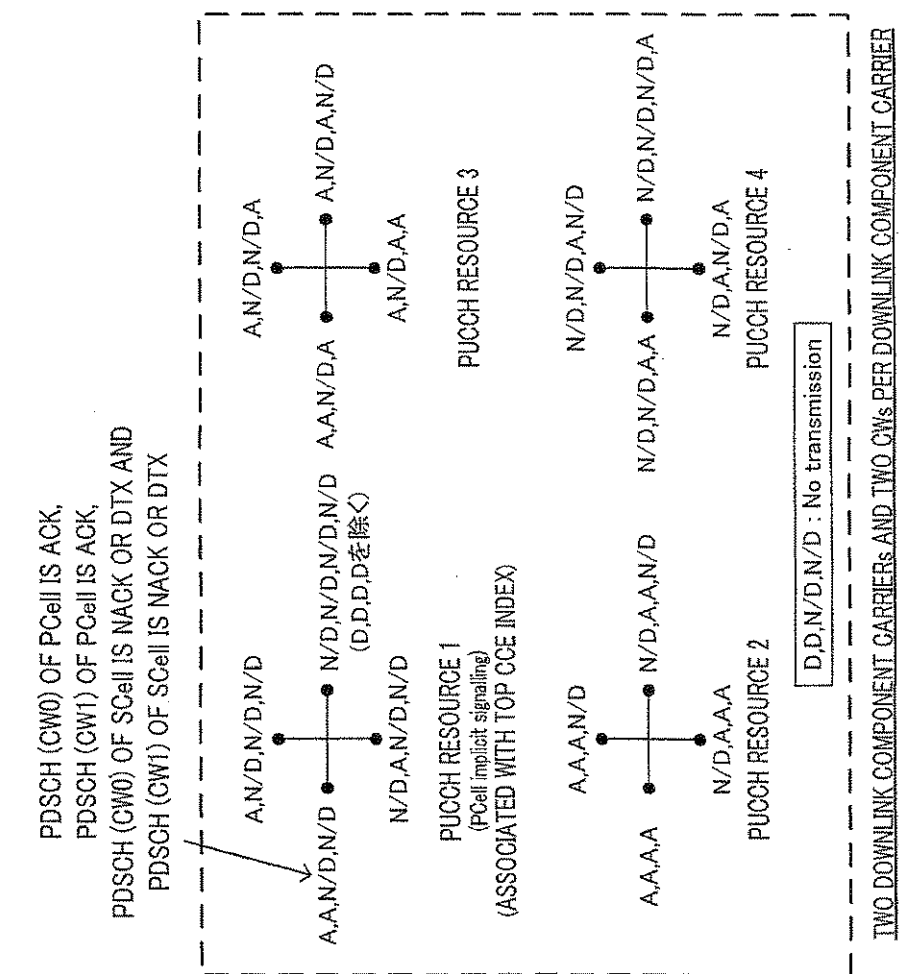


FIG. 27A

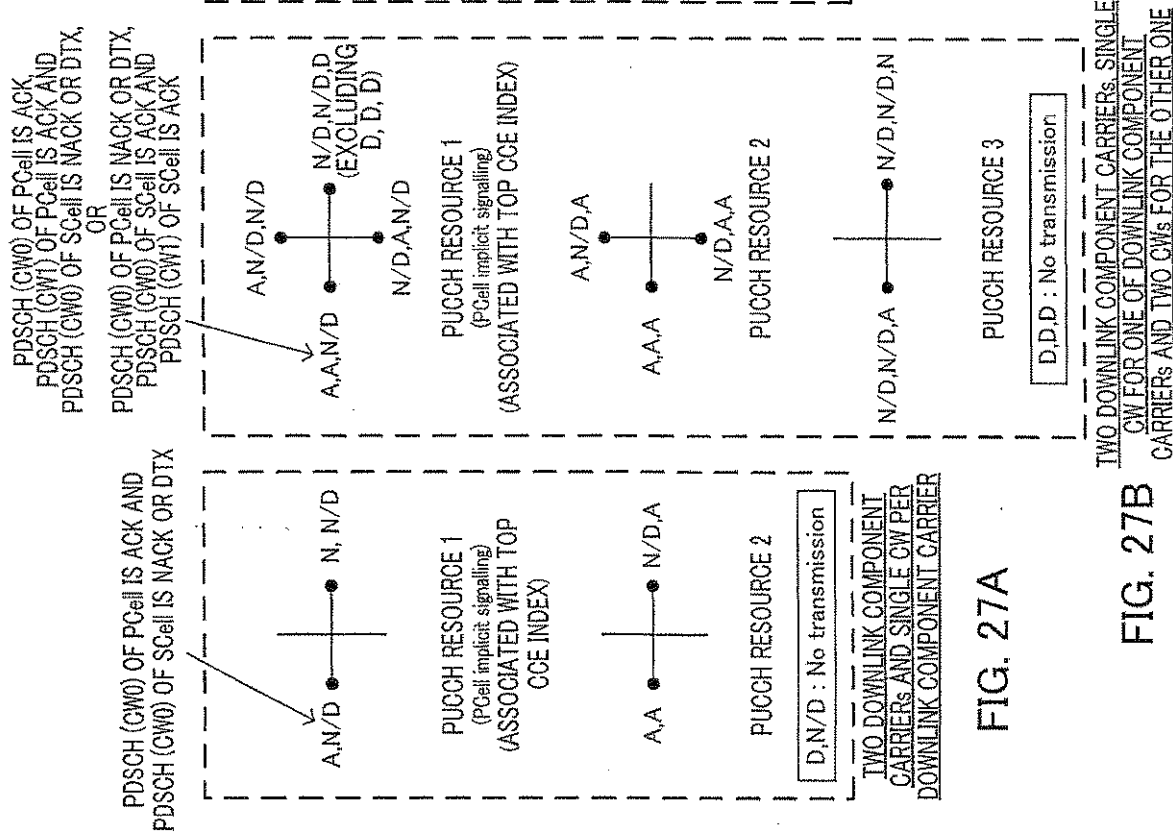


FIG. 27B

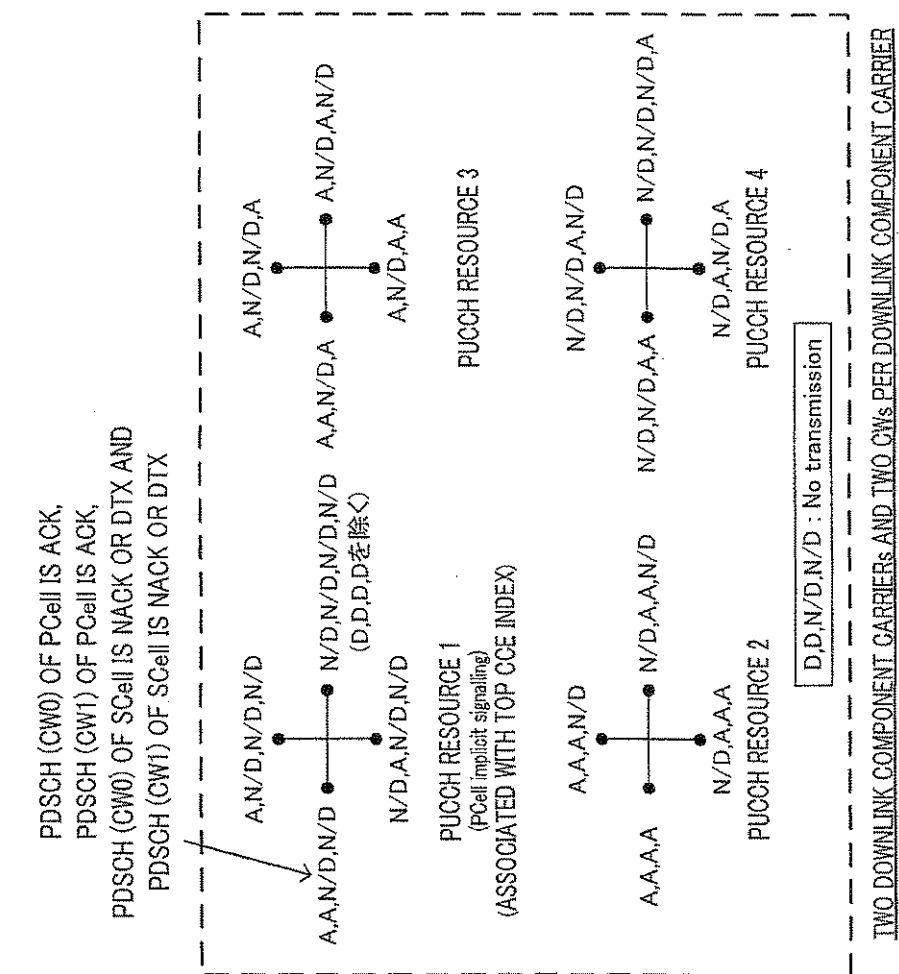


FIG. 27C

MAPPING TABLE WHEN NUMBER
OF ACK/NACK BITS IS TWO

ACK/NACK state		ACK/NACK resource	
b0	b1	Ch1	Ch2
A	A		-1
A	N/D	-1	
N/D	A		+1
N	N/D	+1	
D	N/D	No transmission	

PCell
SCell

FIG. 28A

MAPPING TABLE WHEN NUMBER
OF ACK/NACK BITS IS THREE

ACK/NACK state			ACK/NACK resource		
b0	b1	b2	Ch1	Ch2	Ch3
A	A	A		-1	
A	N/D	A		+j	
N/D	A	A		-j	
N/D	N/D	A			-1
A	A	N/D	-1		
A	N/D	N/D	+j		
N/D	A	N/D	-j		
N/D	N/D	N			+1
N	N/D	D	+1		
D	N	D	+1		
D	D	D	No transmission		

FIG. 28B

CELL IN WHICH TRANSMISSION
MODE SUPPORTING UP TO TWO-CW
TRANSMISSION IS CONFIGURED
(MIMO Cell)

CELL IN WHICH TRANSMISSION
MODE SUPPORTING SINGLE-CW
TRANSMISSION IS CONFIGURED
(non-MIMO Cell)

MAPPING TABLE WHEN NUMBER OF ACK/NACK BITS IS FOUR

ACK/NACK state				ACK/NACK resource			
b0	b1	b2	b3	Ch1	Ch2	Ch3	Ch4
A	A	A	A		-1		
A	N/D	A	A			-j	
N/D	A	A	A		-j		
N/D	N/D	A	A		+j		-1
A	A	A	N/D			+1	
A	N/D	A	N/D		+1		
N/D	A	A	N/D				+j
N/D	N/D	A	N/D			-1	
A	A	N/D	A			+j	
A	N/D	N/D	A				-j
N/D	A	N/D	A				+1
N/D	N/D	N/D	A		-1		
A	A	N/D	N/D	+j			
N/D	A	N/D	N/D	-j			
N	N/D	N/D	N/D	+1			
D	N	N/D	N/D	+1			
D	D	N/D	N/D	No transmission			

PCell
SCell

FIG. 28C

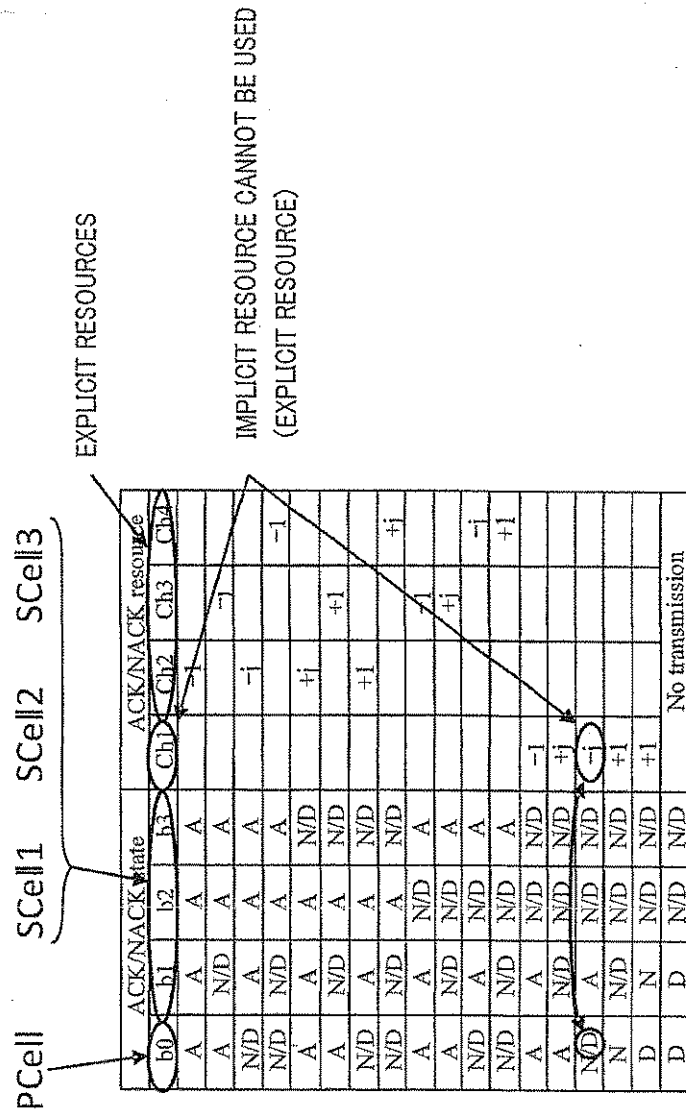
Configured CWs on PCell	Configured CWs on SCell1	Configured CWs on SCell2	Configured CWs on SCell3	Number of ACK/NACK
1	1	-	-	2
1	2	-	-	3
2	1	-	-	3
2	2	-	-	4
1	1	1	-	3
1	1	2	-	4
1	2	1	-	4
2	1	1	-	4
1	1	1	1	4

2CCs

3CCs

4CCs

FIG. 29

FIG^x 30

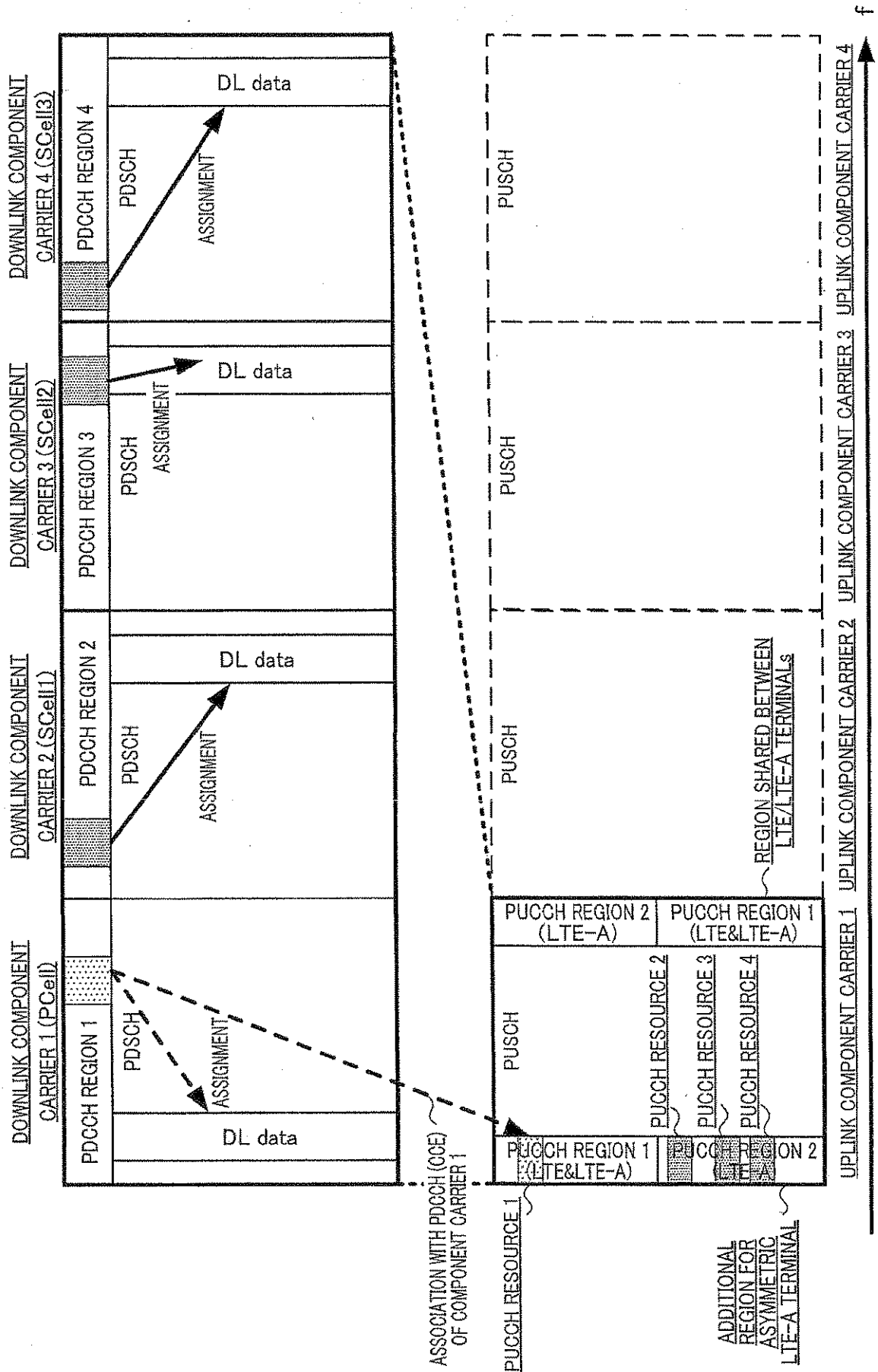


FIG. 31

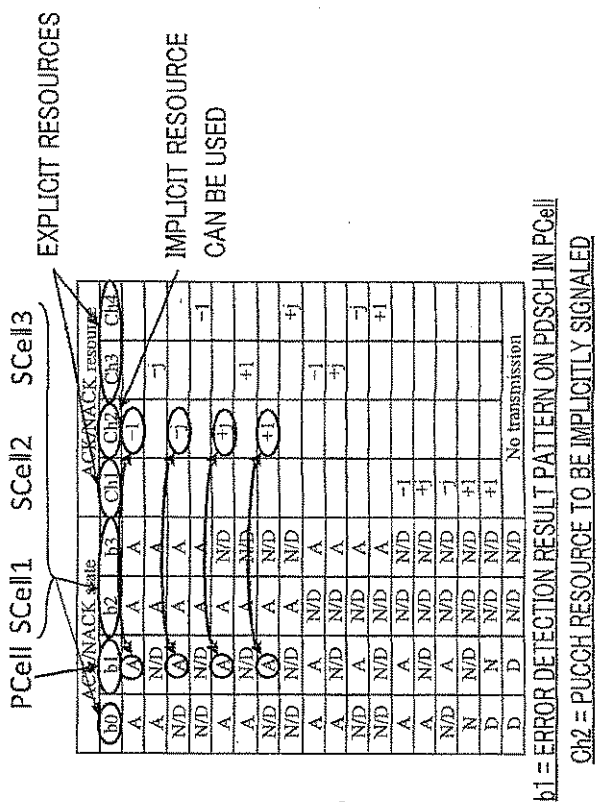


FIG. 32B

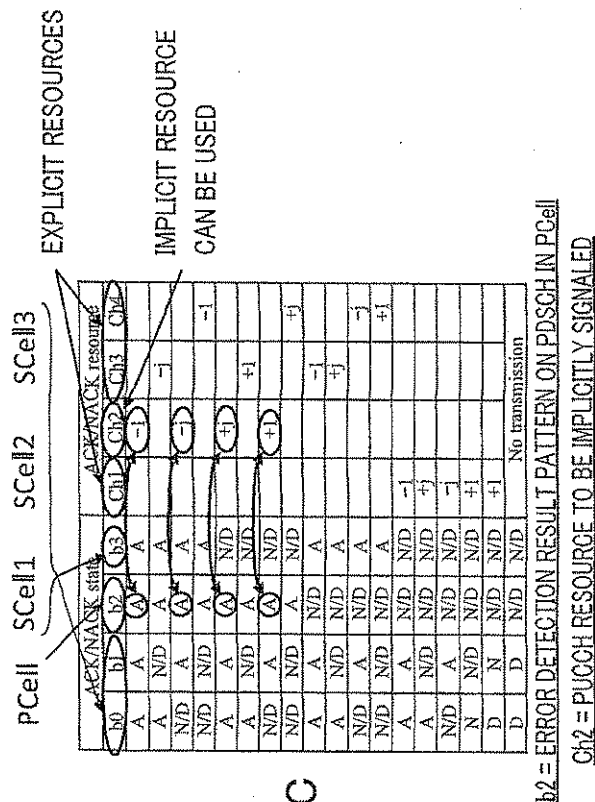


FIG. 32C

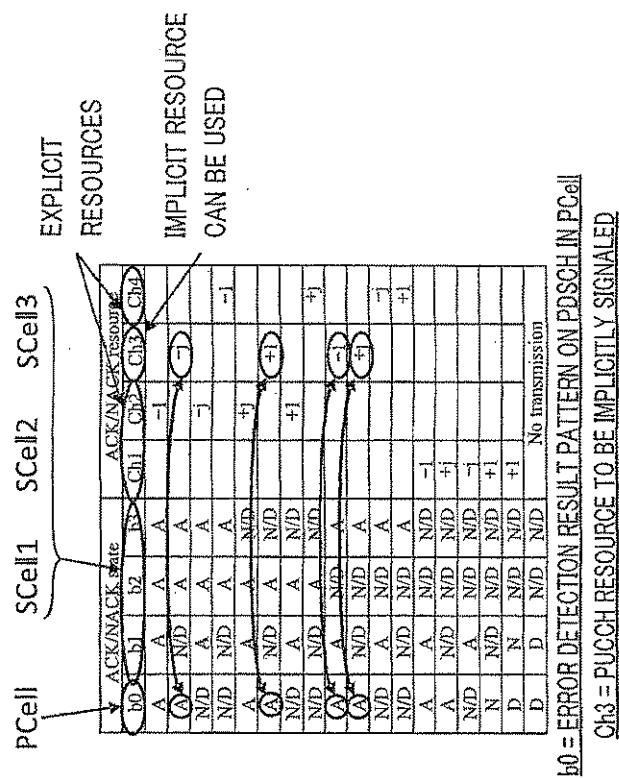


FIG. 32A

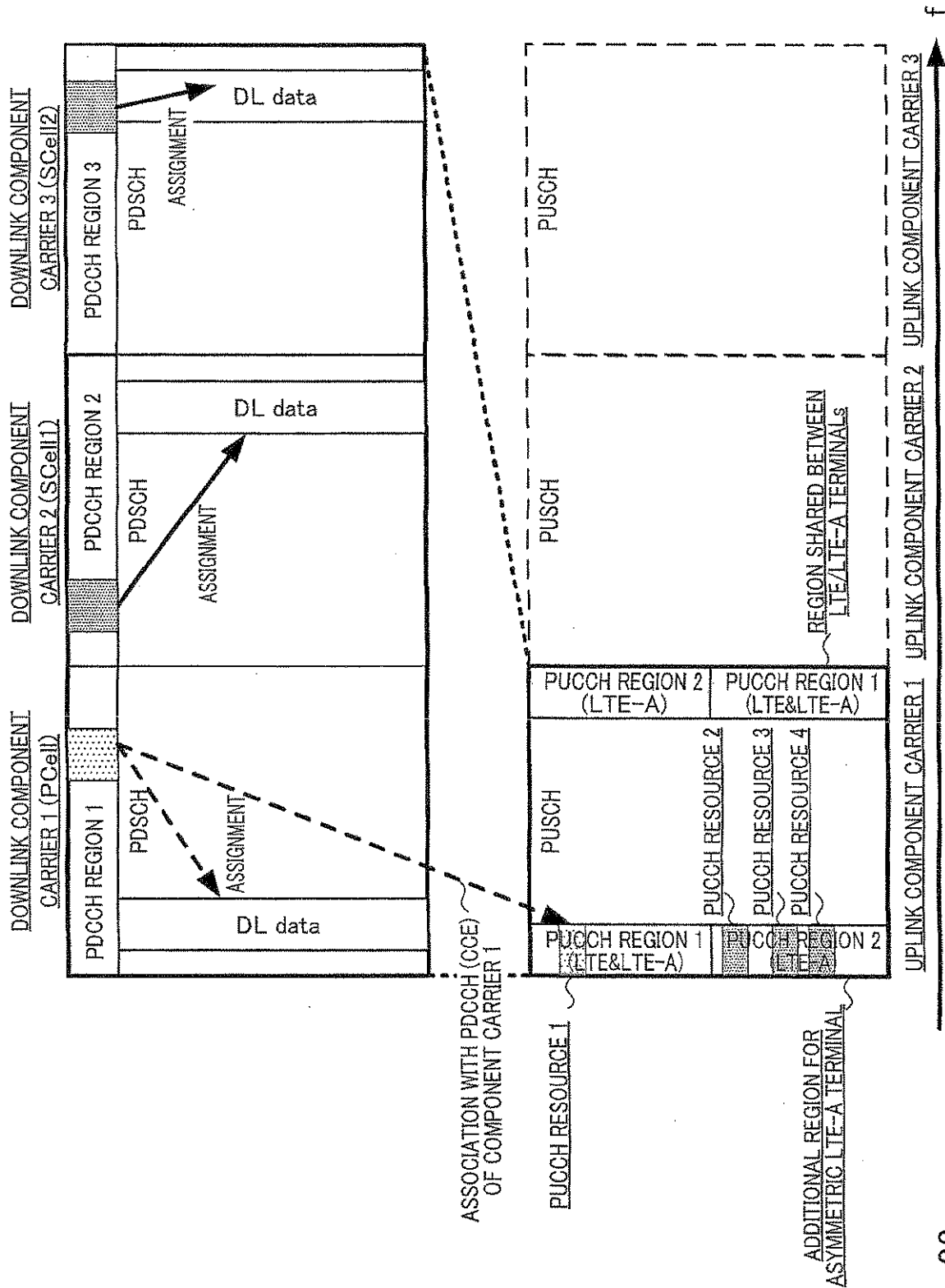


FIG. 33

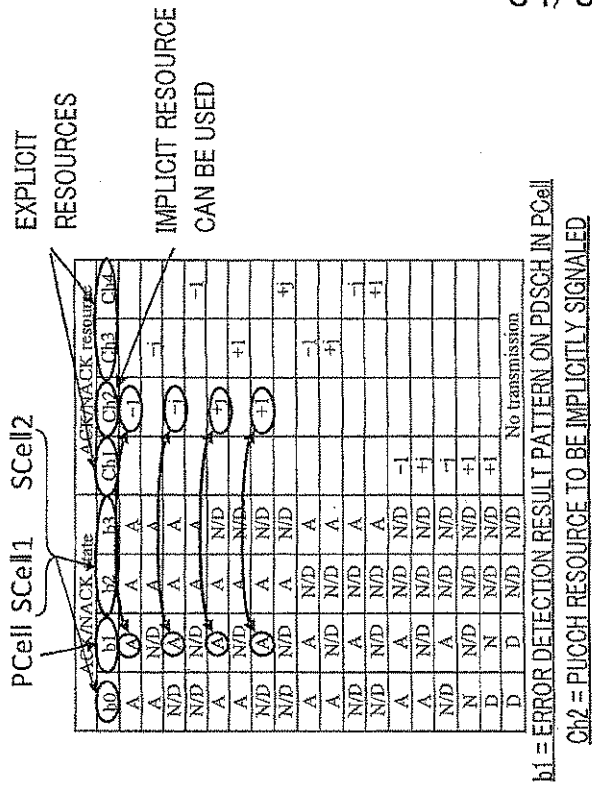


FIG. 34B

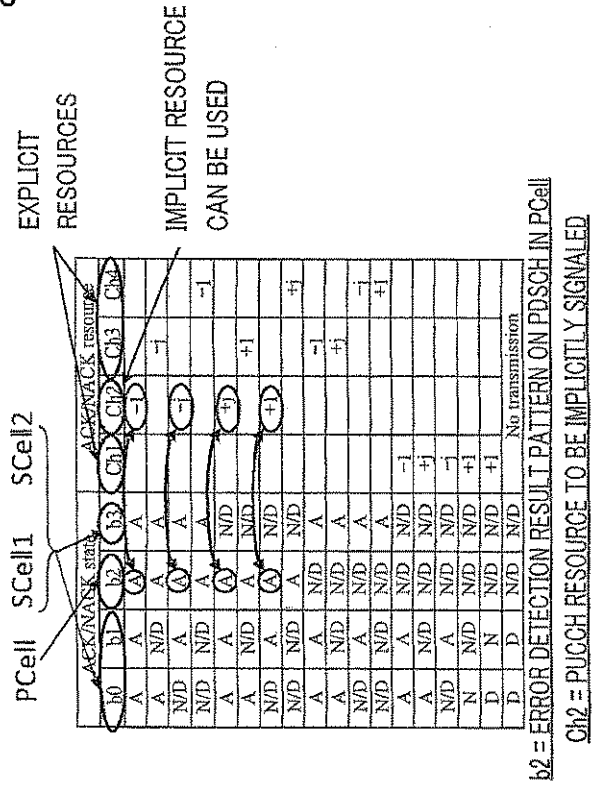


FIG. 34C

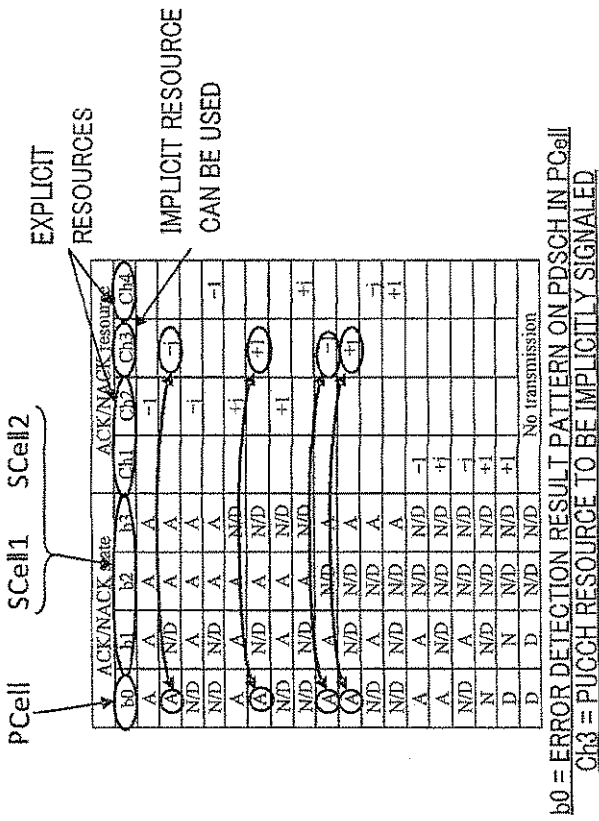


FIG. 34A

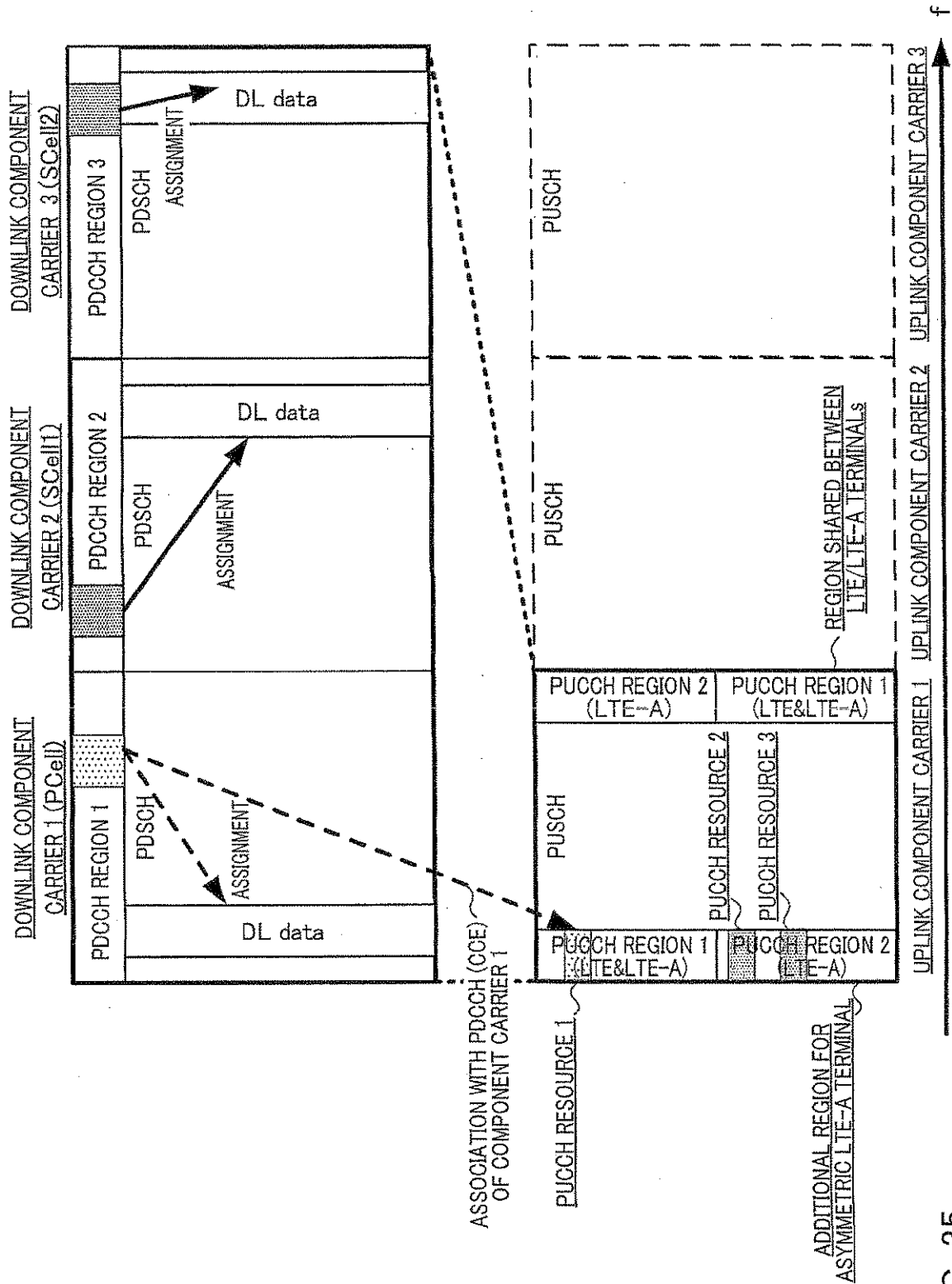


FIG. 35

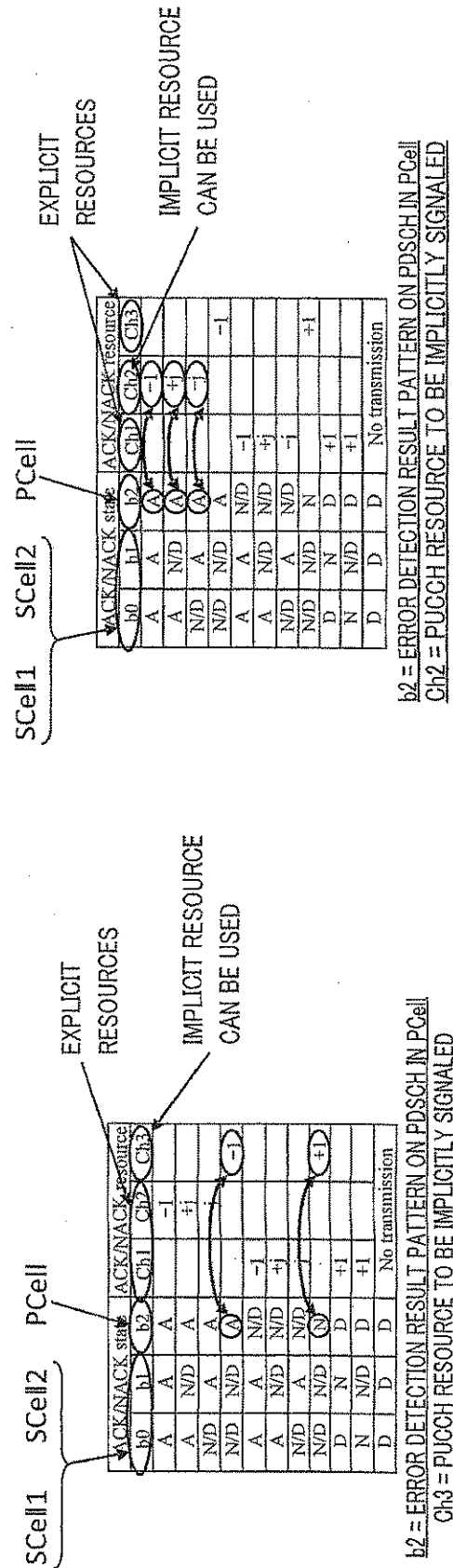


FIG. 36A

FIG. 36B