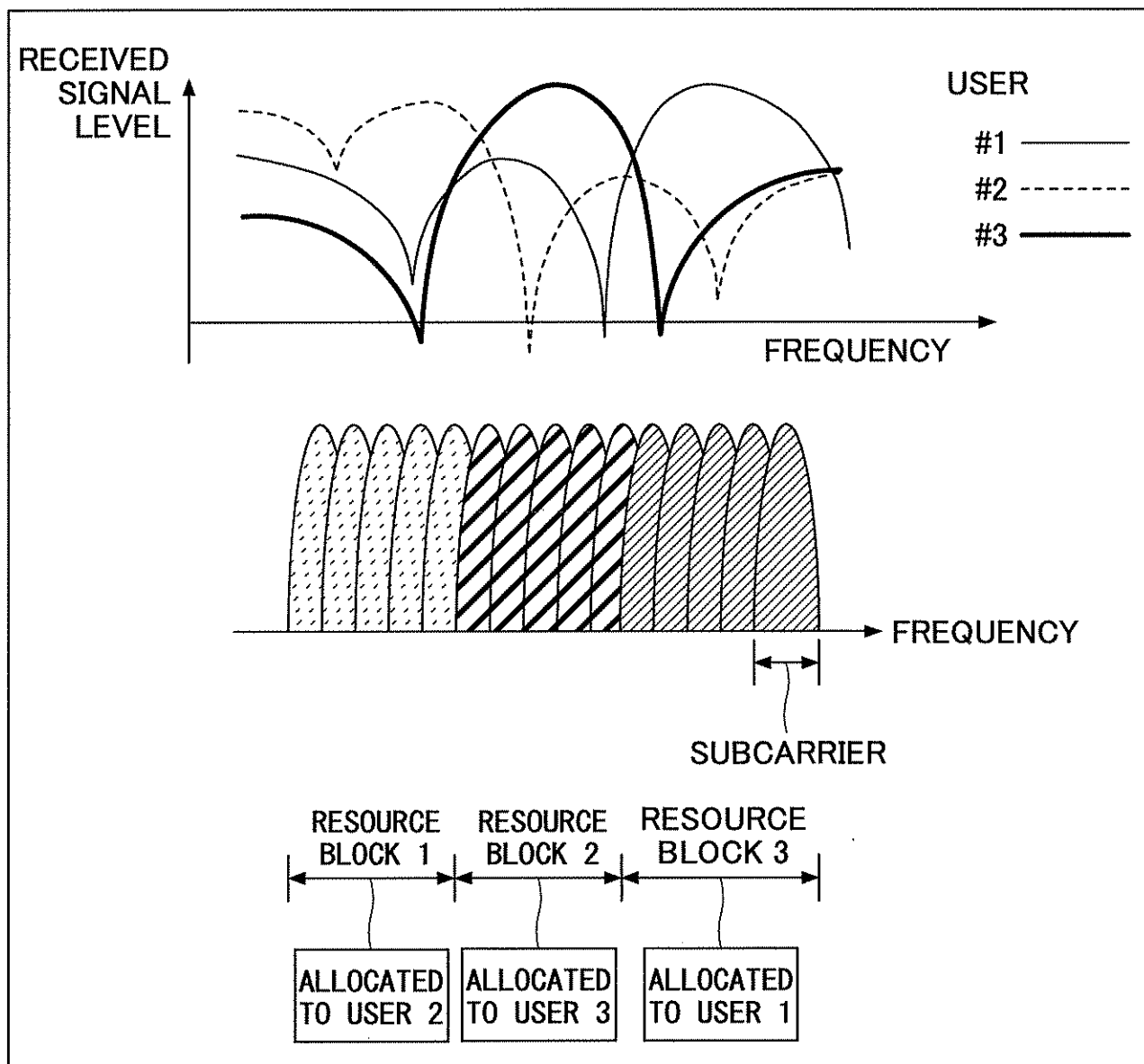


FIG. 1



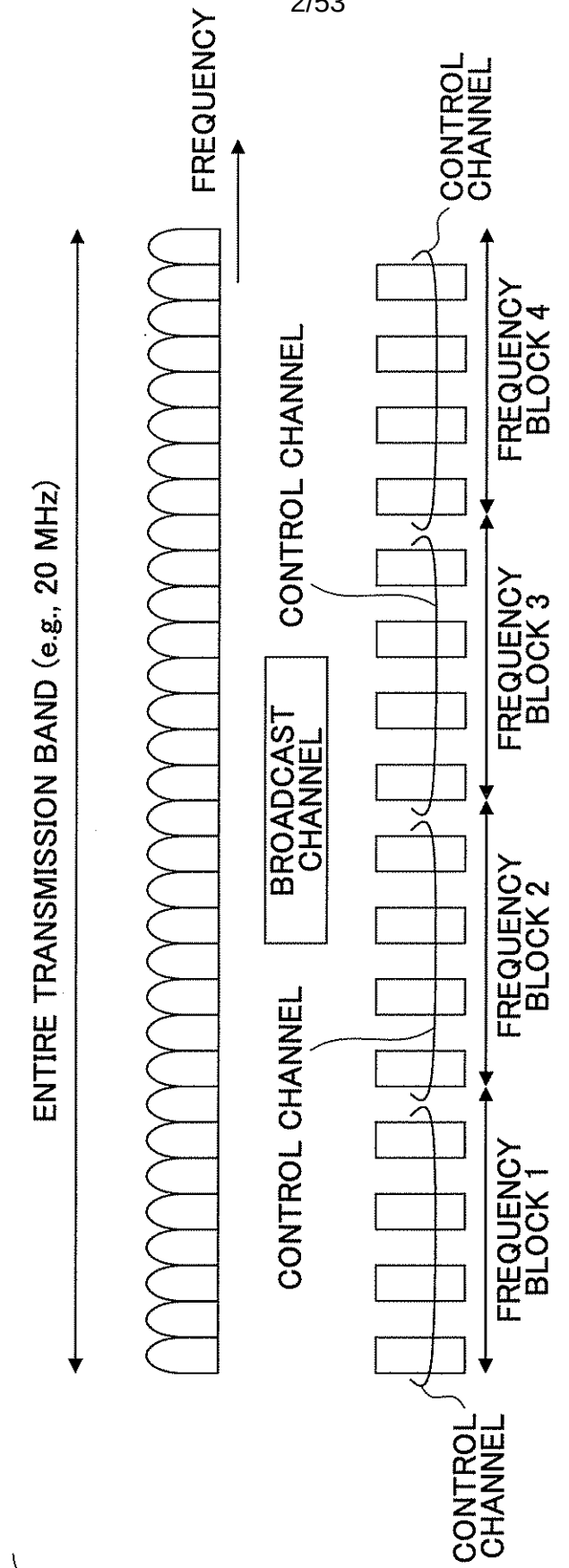


FIG.2

FIG.3A

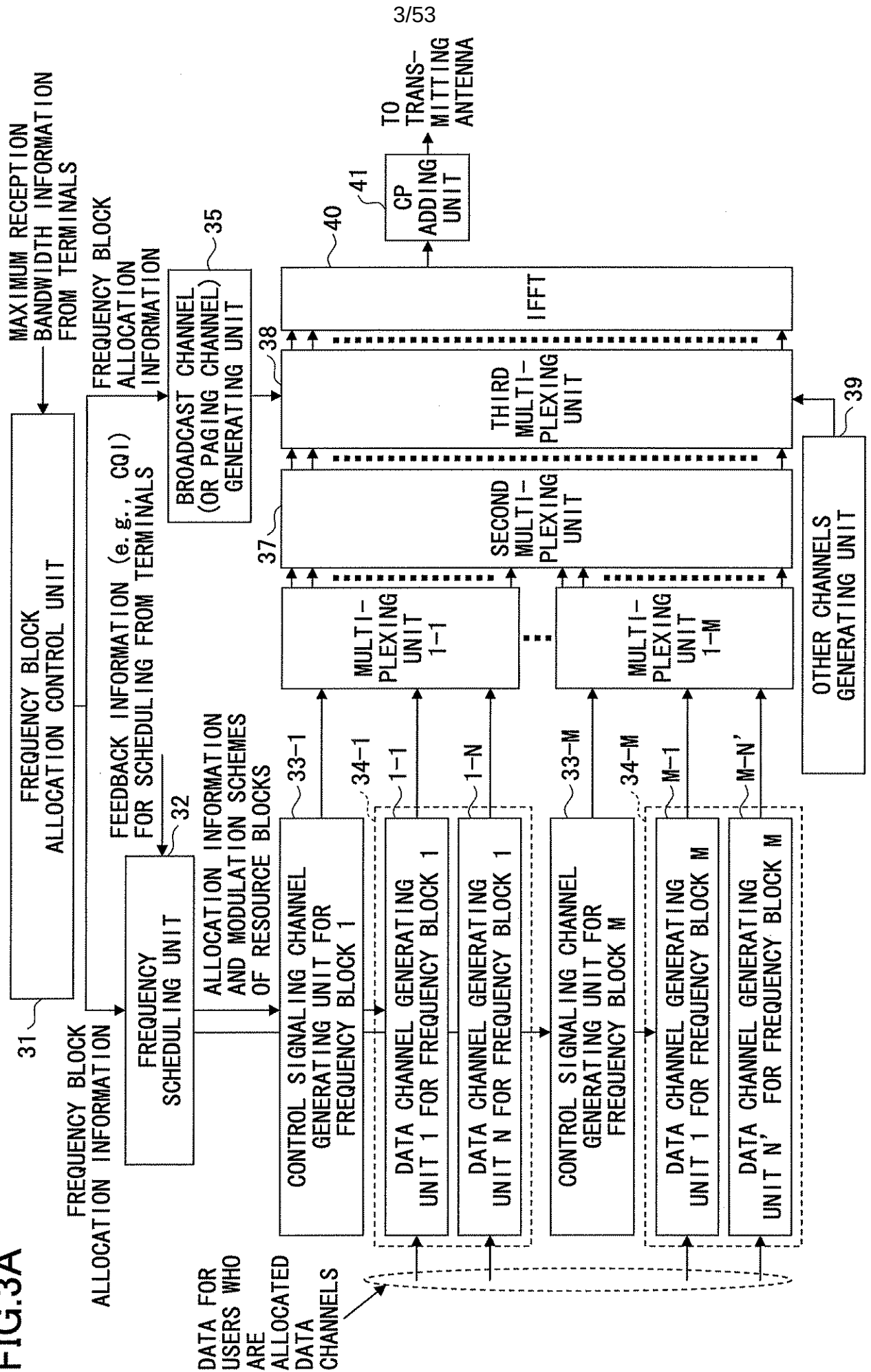


FIG.3B

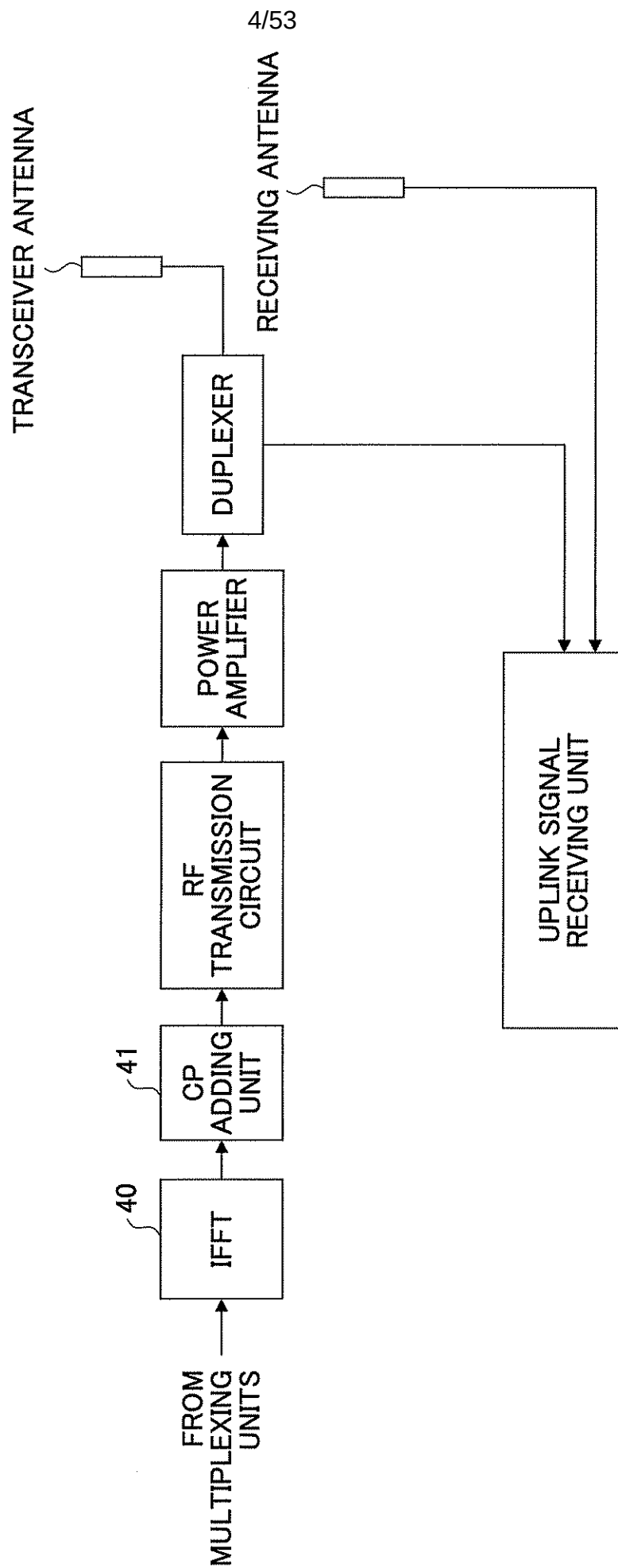
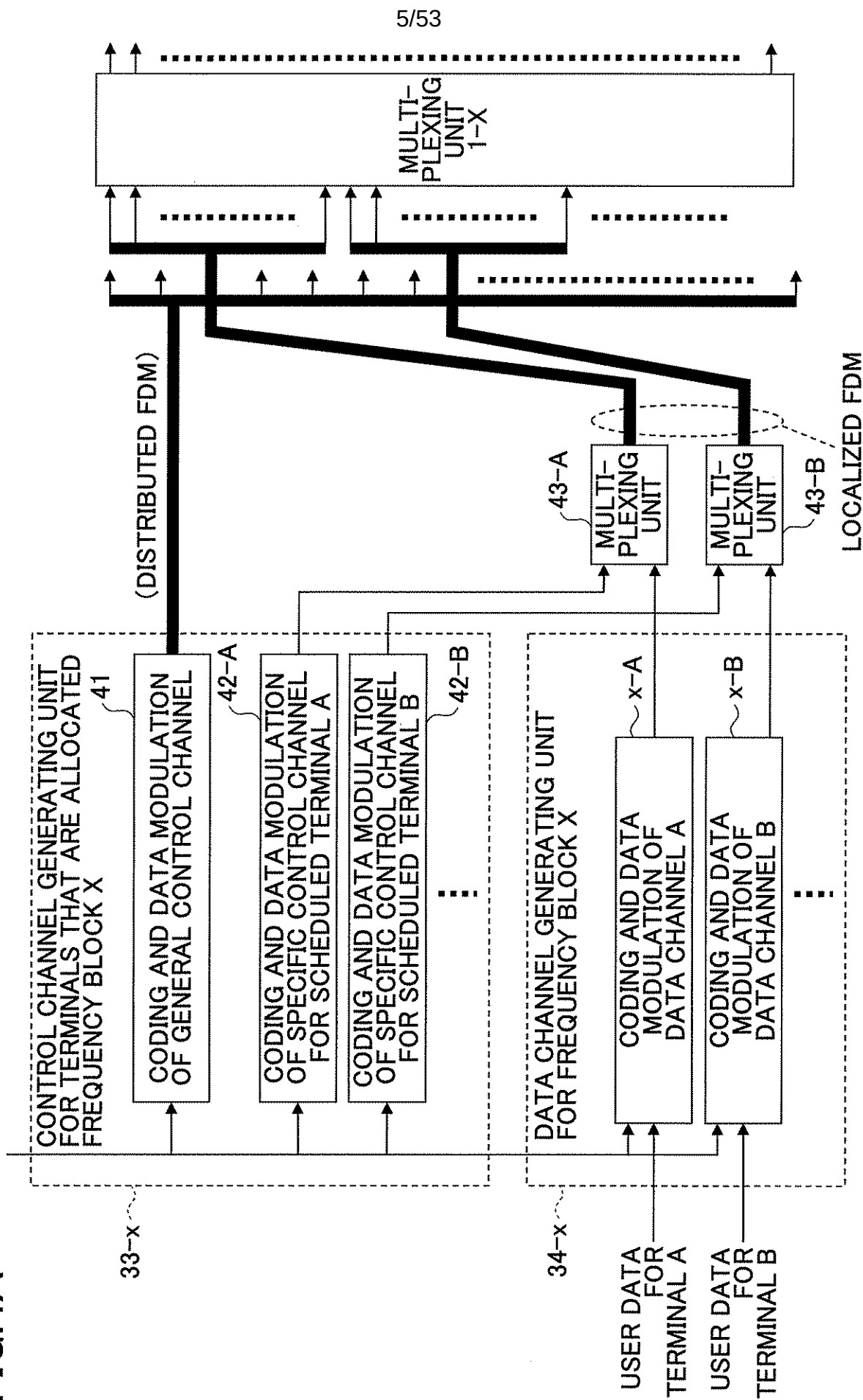


FIG. 4A

SCHEDULING INFORMATION



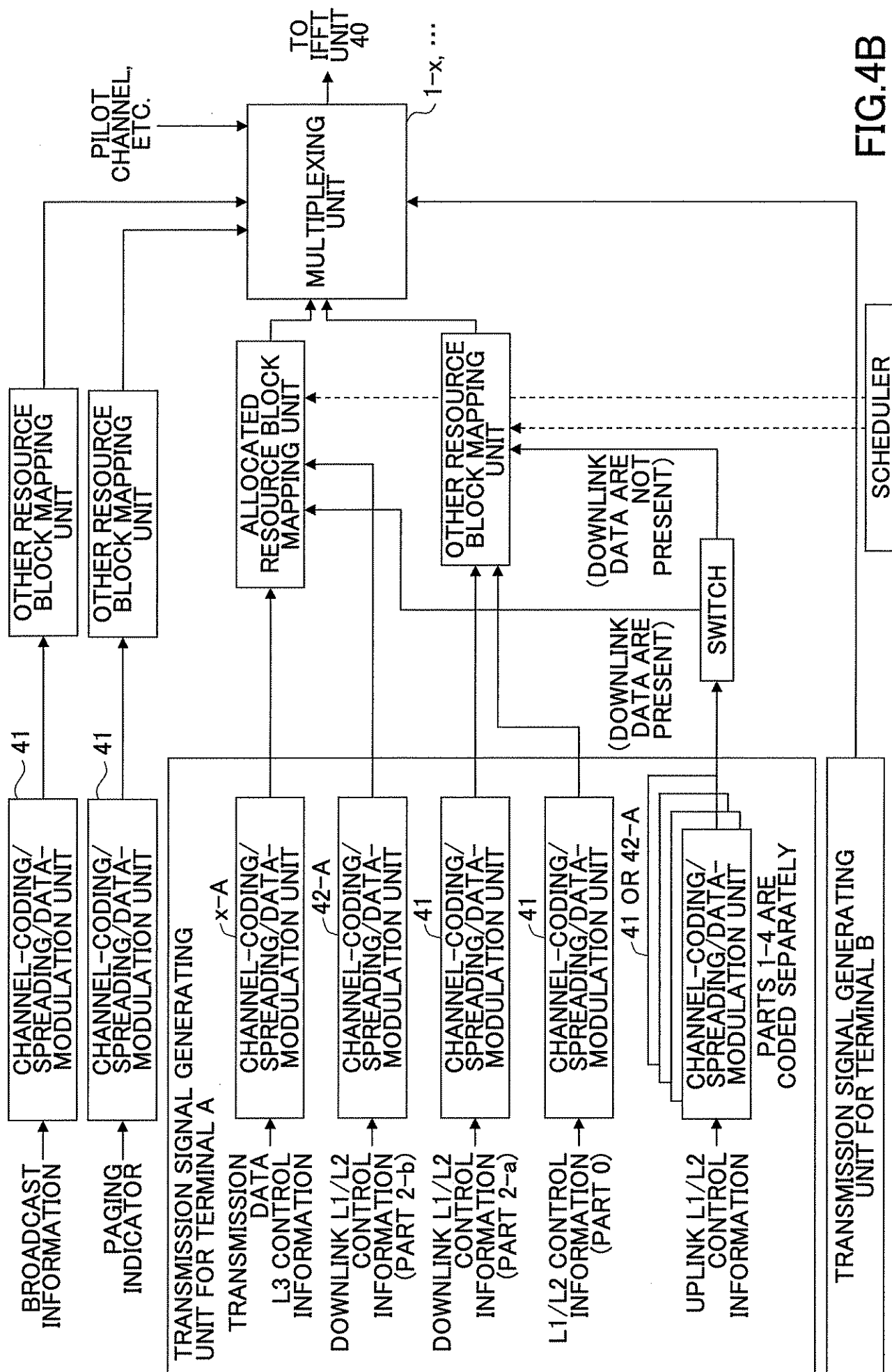


FIG.4B

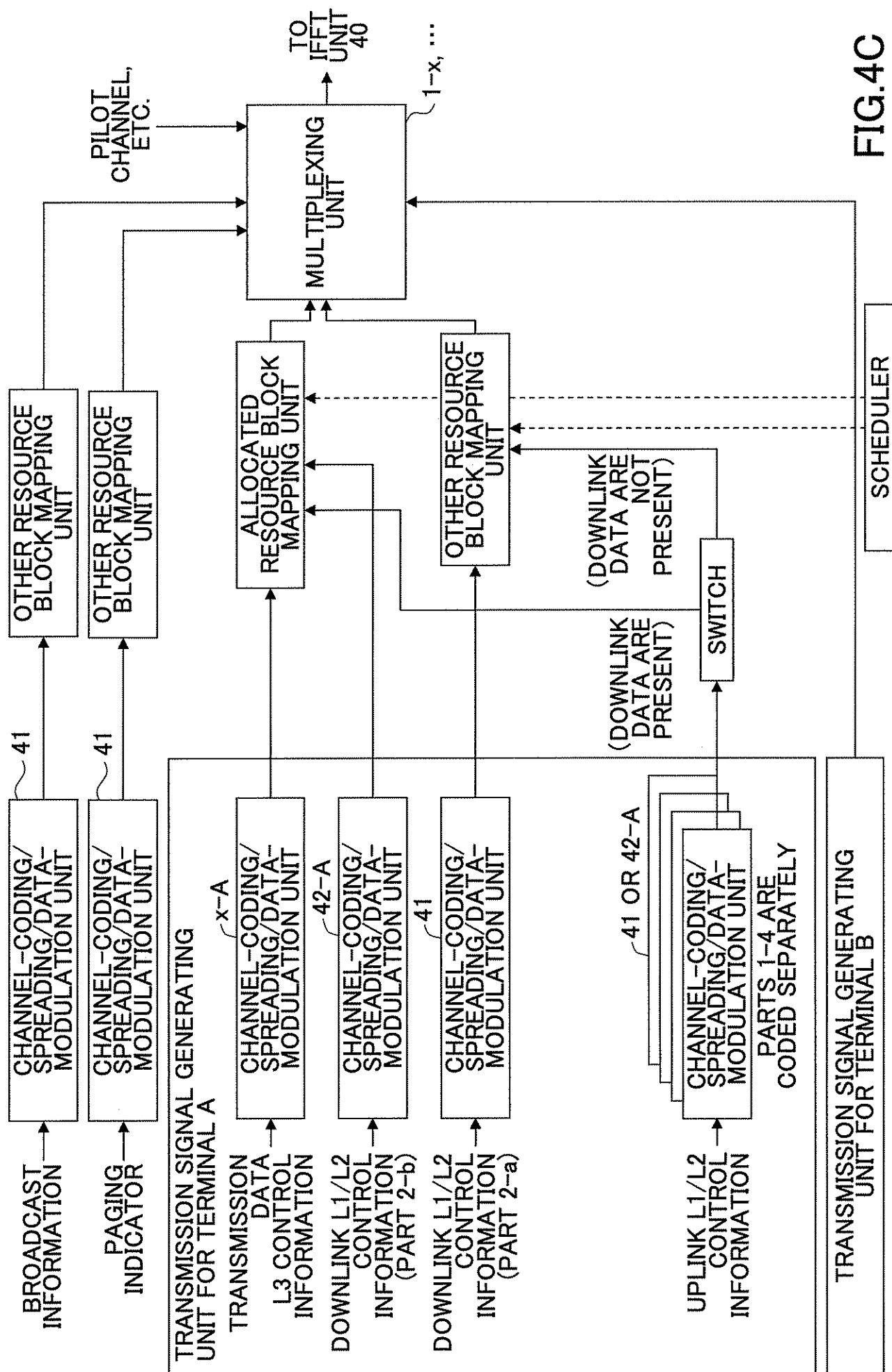


FIG.4C

FIG.5A

CHANNEL TYPE			INFORMATION ITEM	
BROADCAST CHANNEL			TRANSPORT FORMAT OF L1/L2 CONTROL CHANNEL MAXIMUM NUMBER OF MULTIPLEXED USERS RESOURCE BLOCK ALLOCATION MIMO SCHEME	
DEDICATED L3 SIGNALING CHANNEL			TYPE OF FDM SCHEME PERSISTENT SCHEDULING INFORMATION	SPECIFIC CONTROL CHANNEL
L1/L2 CONTROL CHANNEL	PART 0		TRANSPORT FORMAT OF L1/L2 CONTROL CHANNEL NUMBER OF MULTIPLEXED USERS	GENERAL CONTROL CHANNEL
	DOWNLINK DATA TRANSMISSION INFORMATION	PART 1	PAGING INDICATOR	GENERAL CONTROL CHANNEL
		PART 2a	DOWNLINK RESOURCE ALLOCATION ALLOCATION FREQUENCY MIMO INFORMATION (NO. OF STREAMS, ETC.)	
		PART 2b	MIMO PRECODING INFORMATION MODULATION SCHEME PAYLOAD SIZE HARQ INFORMATION CRC INFORMATION	SPECIFIC CONTROL CHANNEL
	UPLINK DATA TRANSMISSION INFORMATION	PART 1	ACK/NACK	SPECIFIC OR GENERAL CONTROL CHANNEL
		PART 2	UPLINK RESOURCE ALLOCATION MODULATION SCHEME PAYLOAD SIZE TRANSMISSION POWER CRC INFORMATION	
		PART 3	TRANSMISSION TIMING CONTROL BITS	
		PART 4	TRANSMISSION POWER CONTROL BIT	

FIG.5B

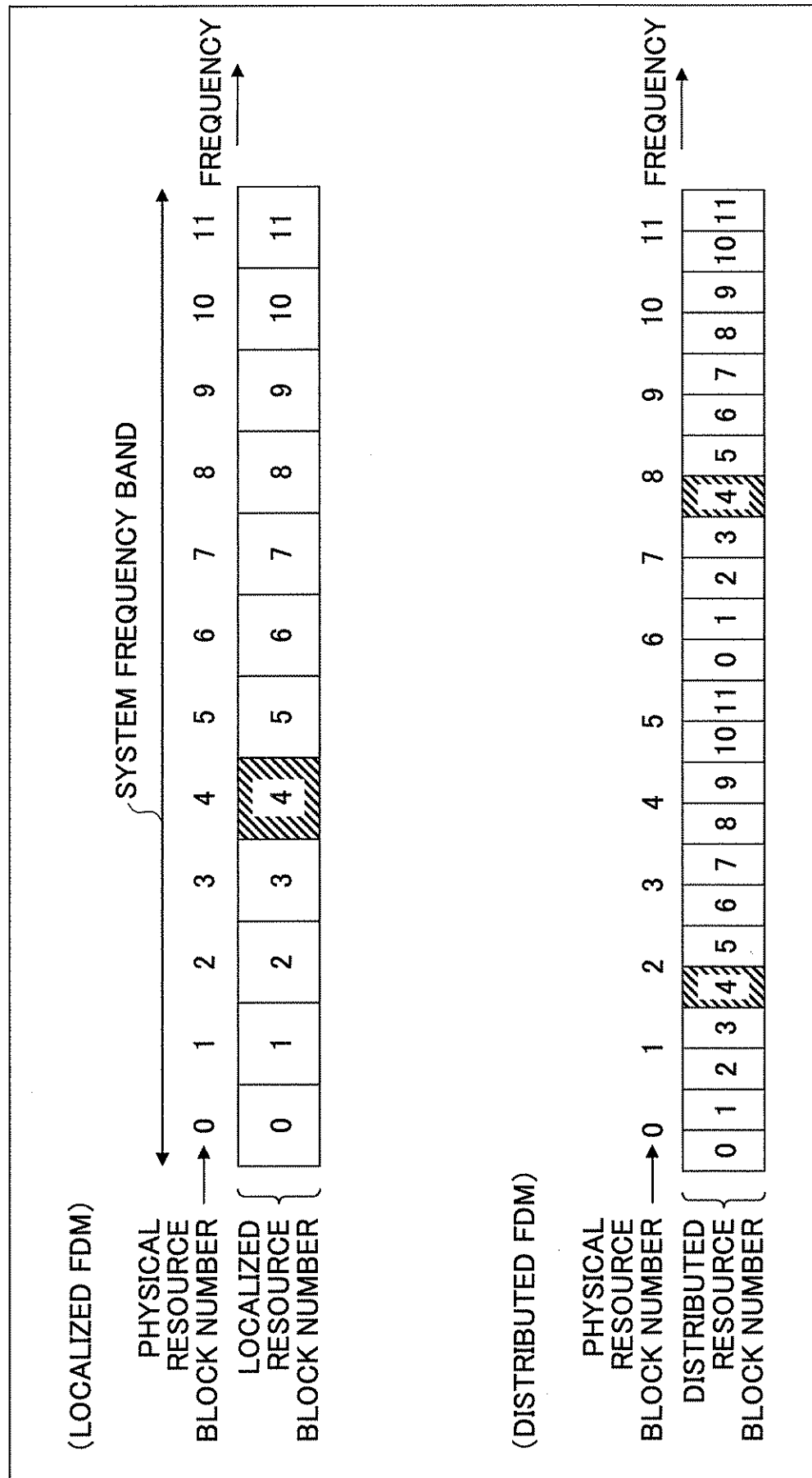
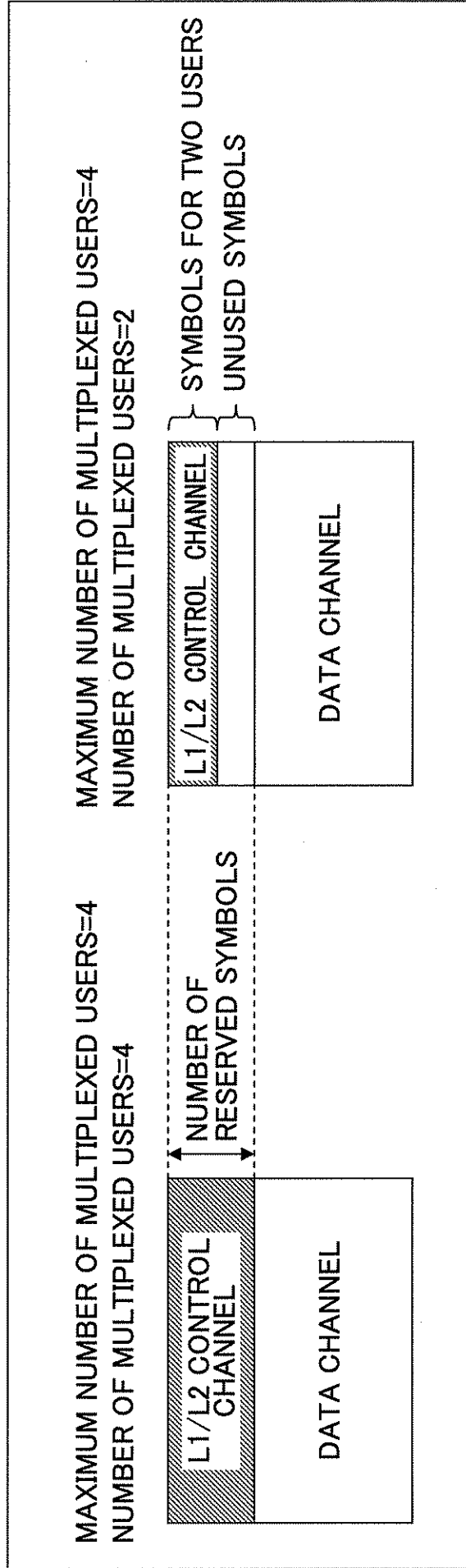


FIG.5C



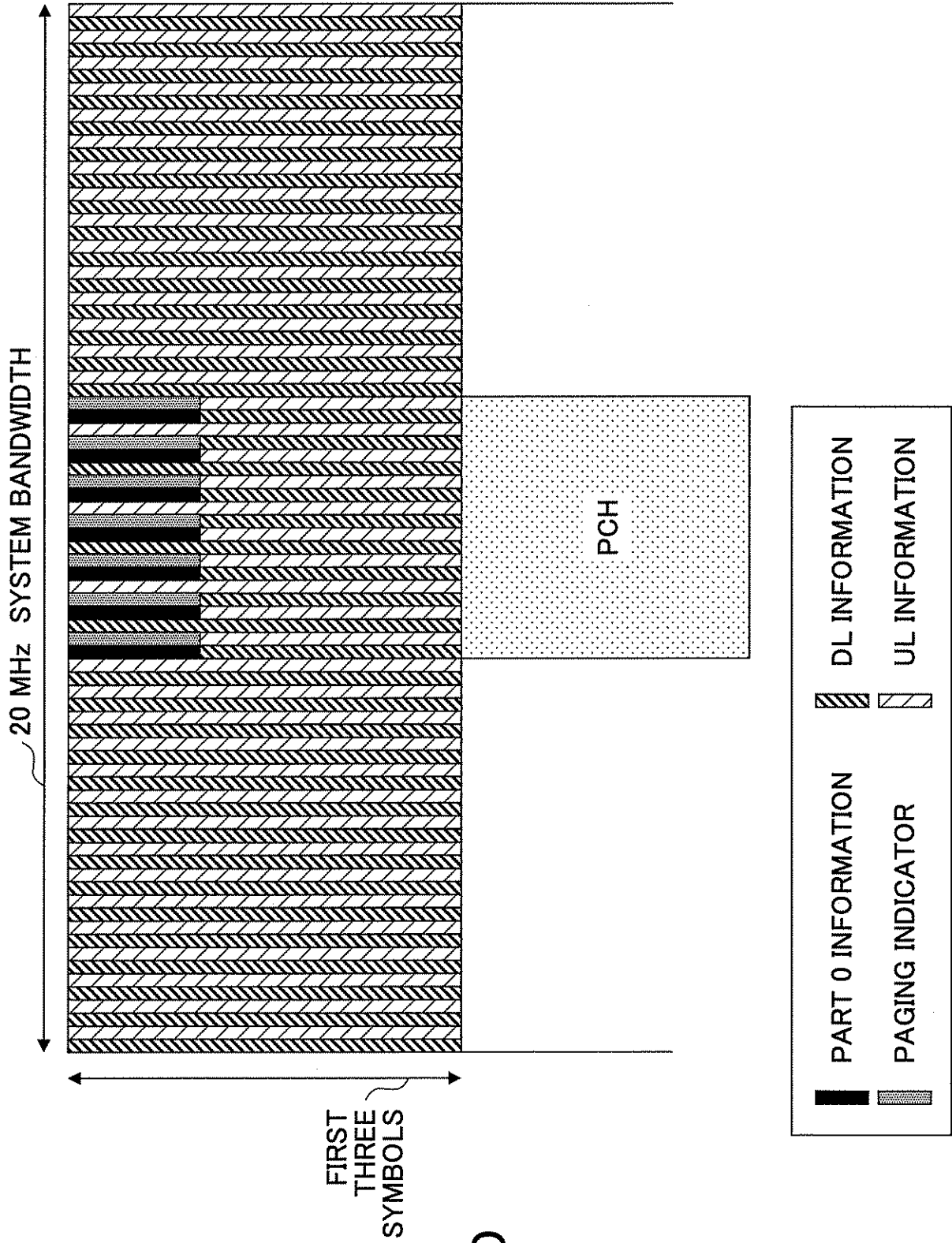


FIG. 5D

FIG.5E

L1/L2 CONTROL CHANNEL

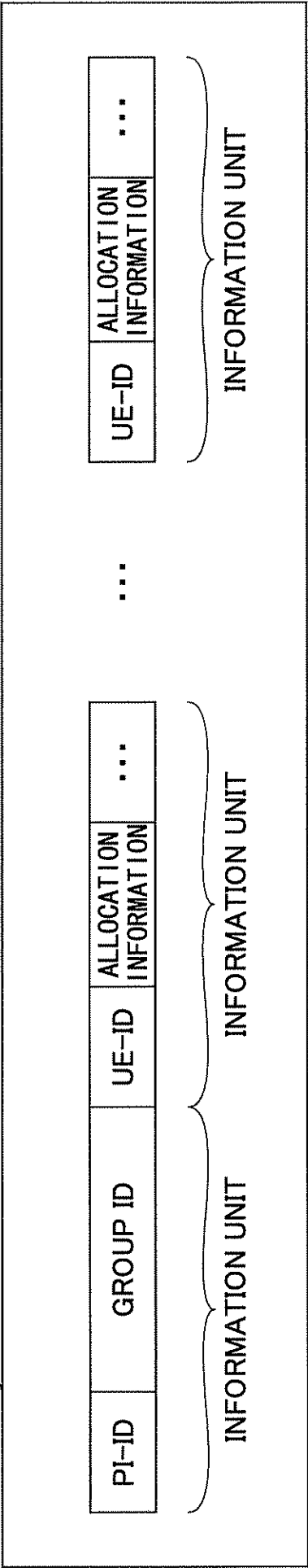


FIG.5F

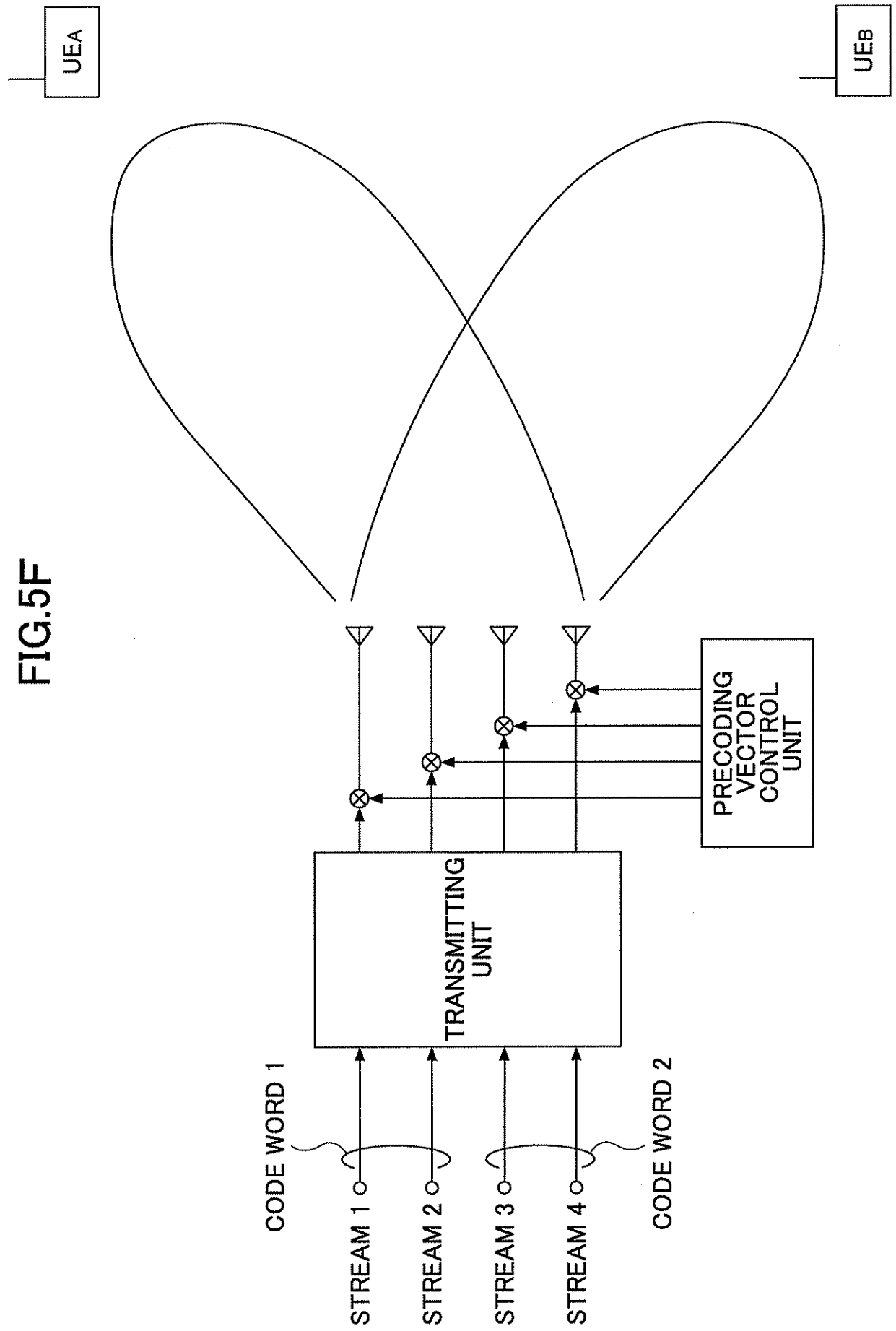


FIG.6

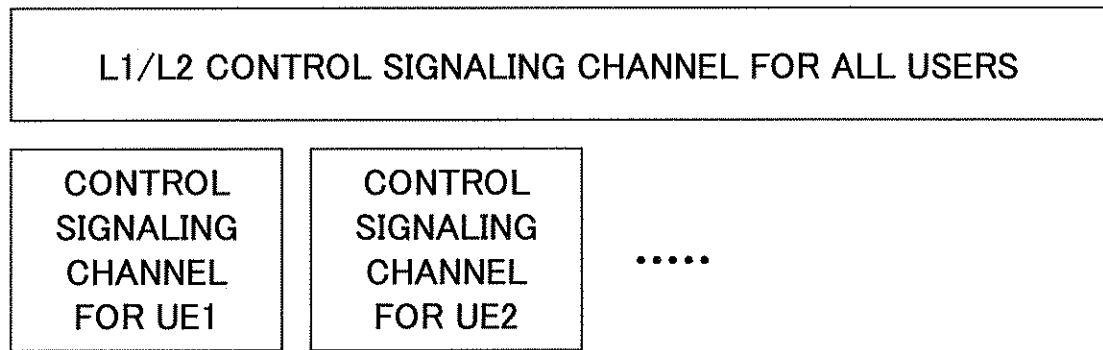


FIG. 7A

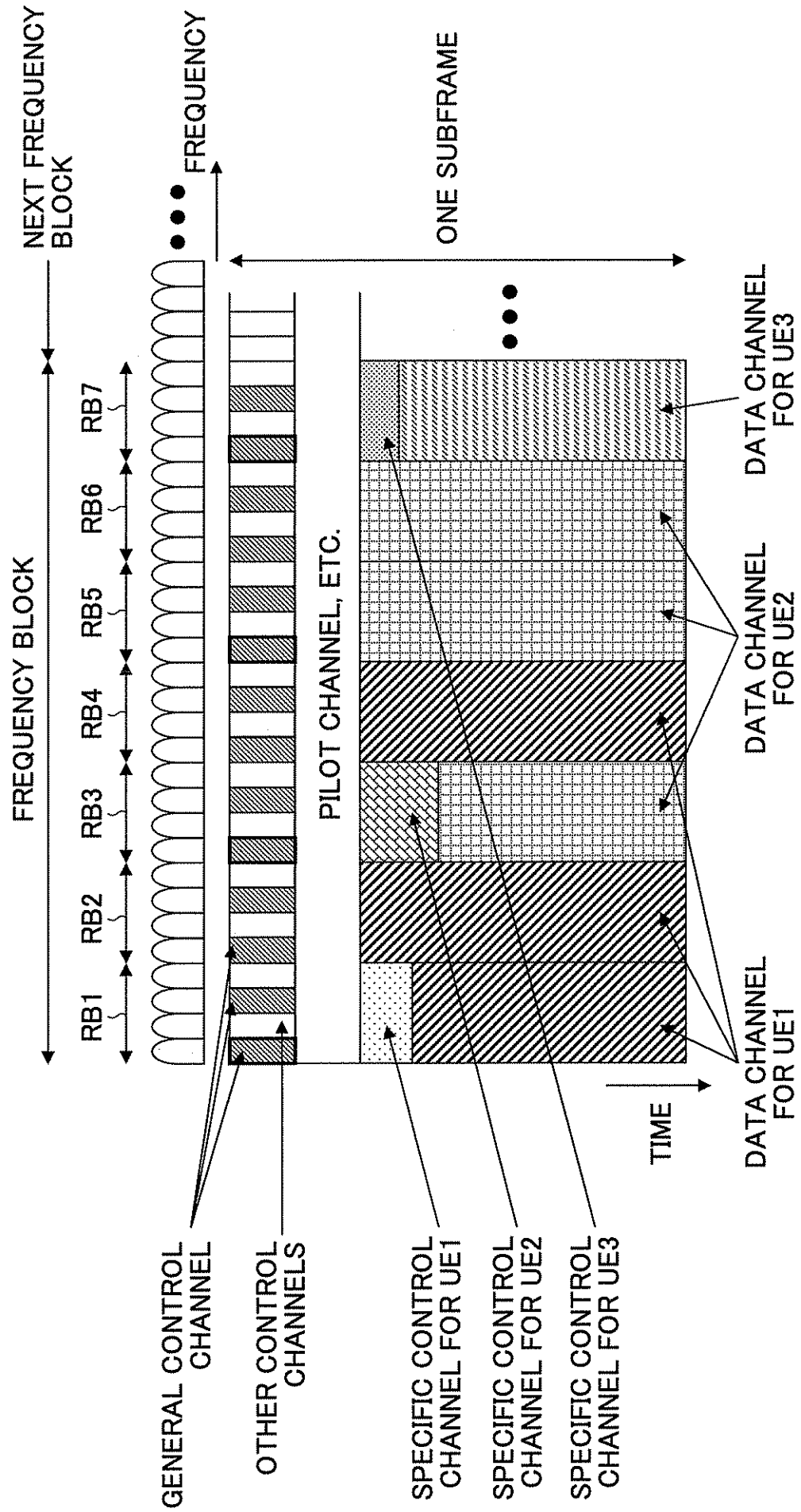


FIG.7B

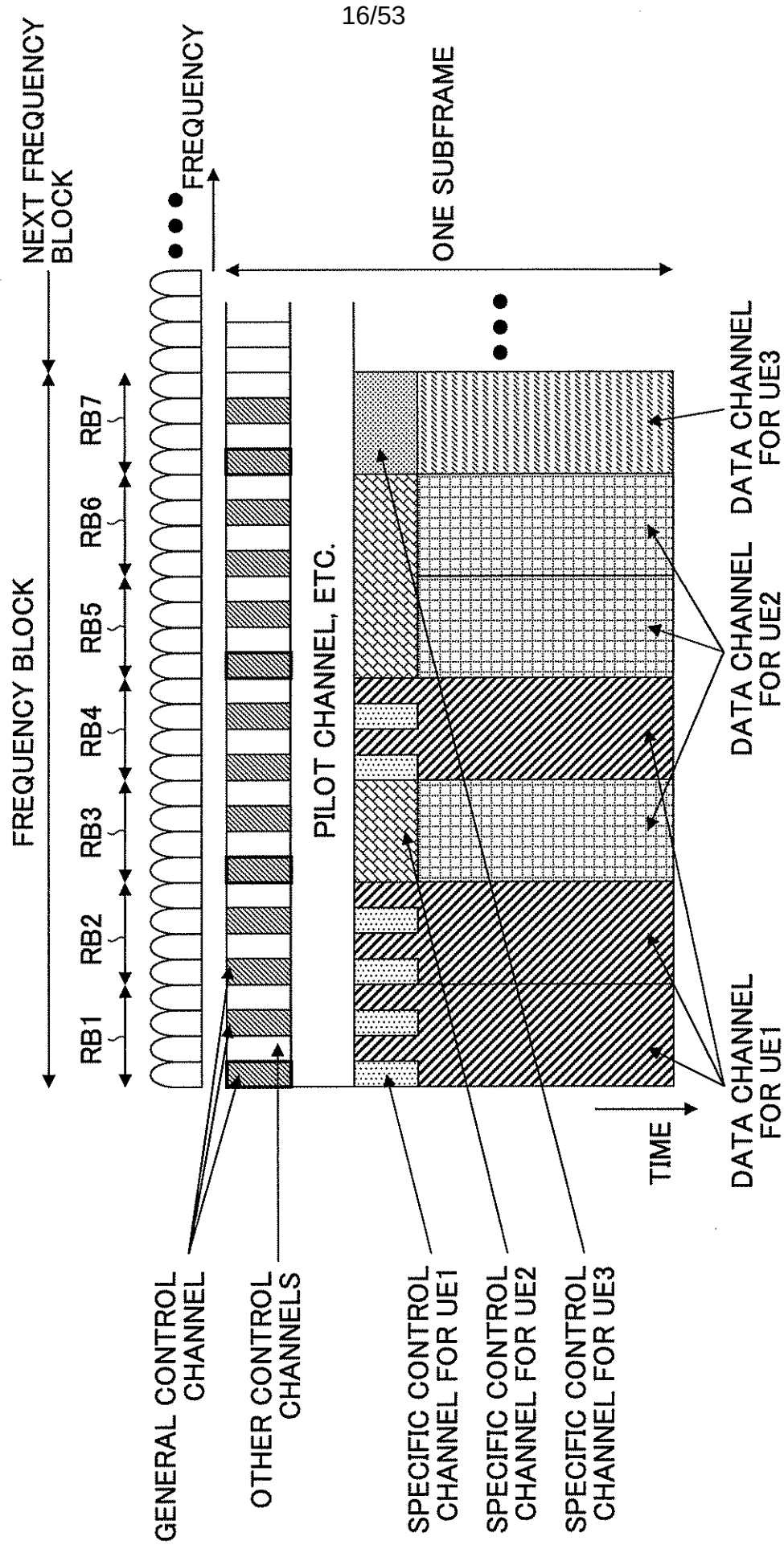


FIG.7C

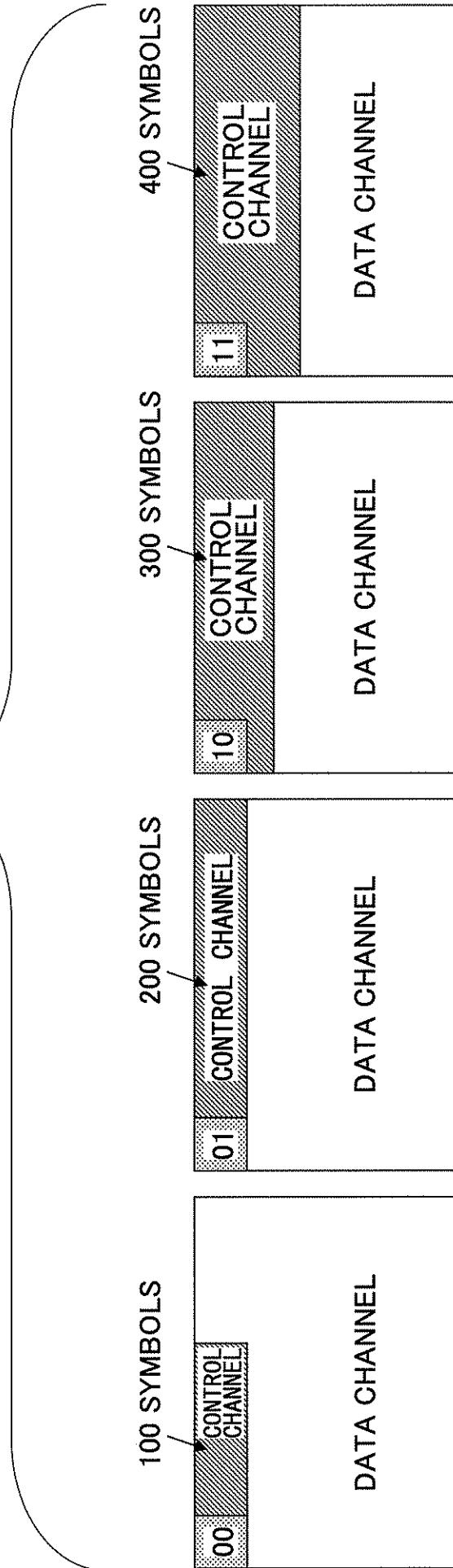
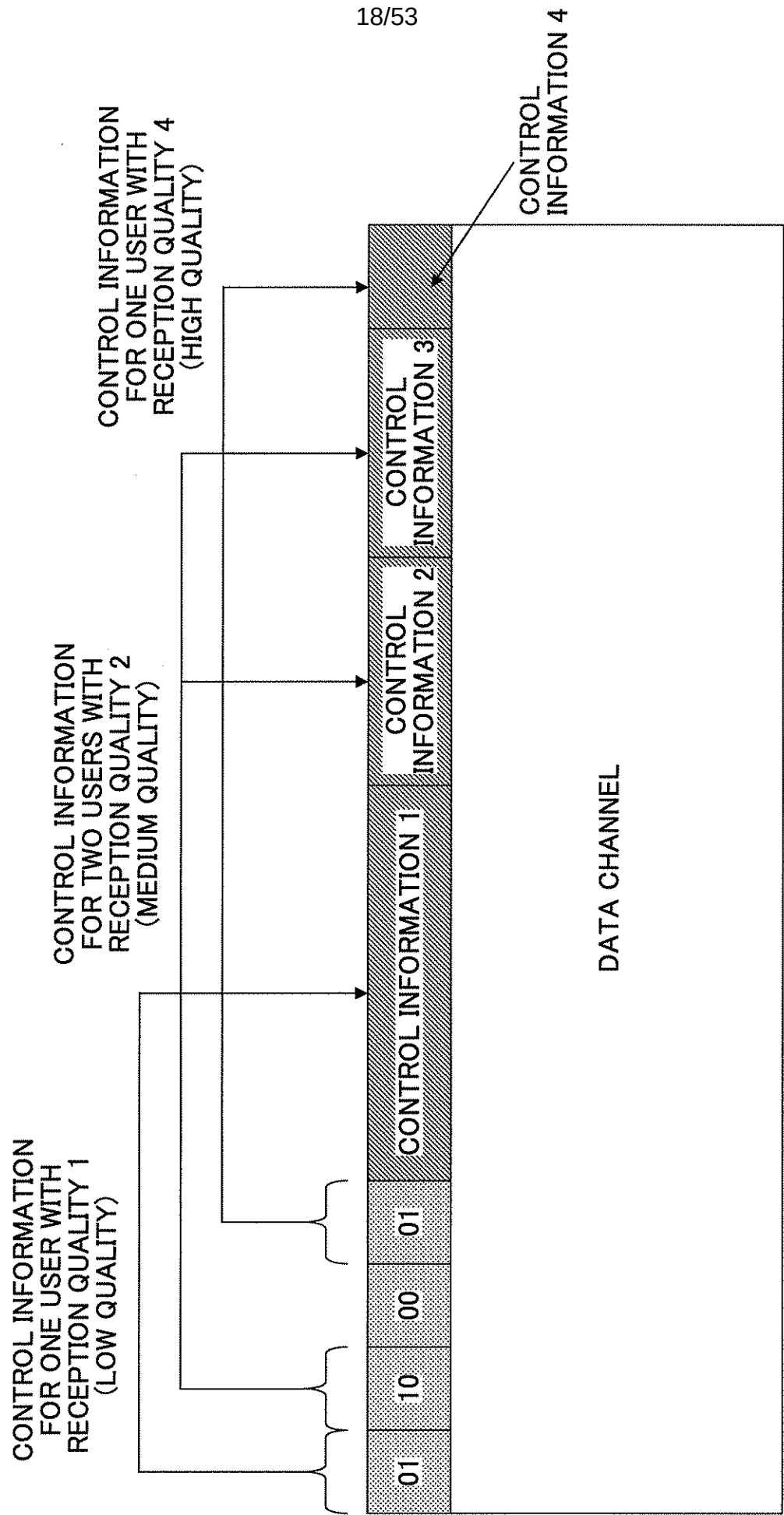
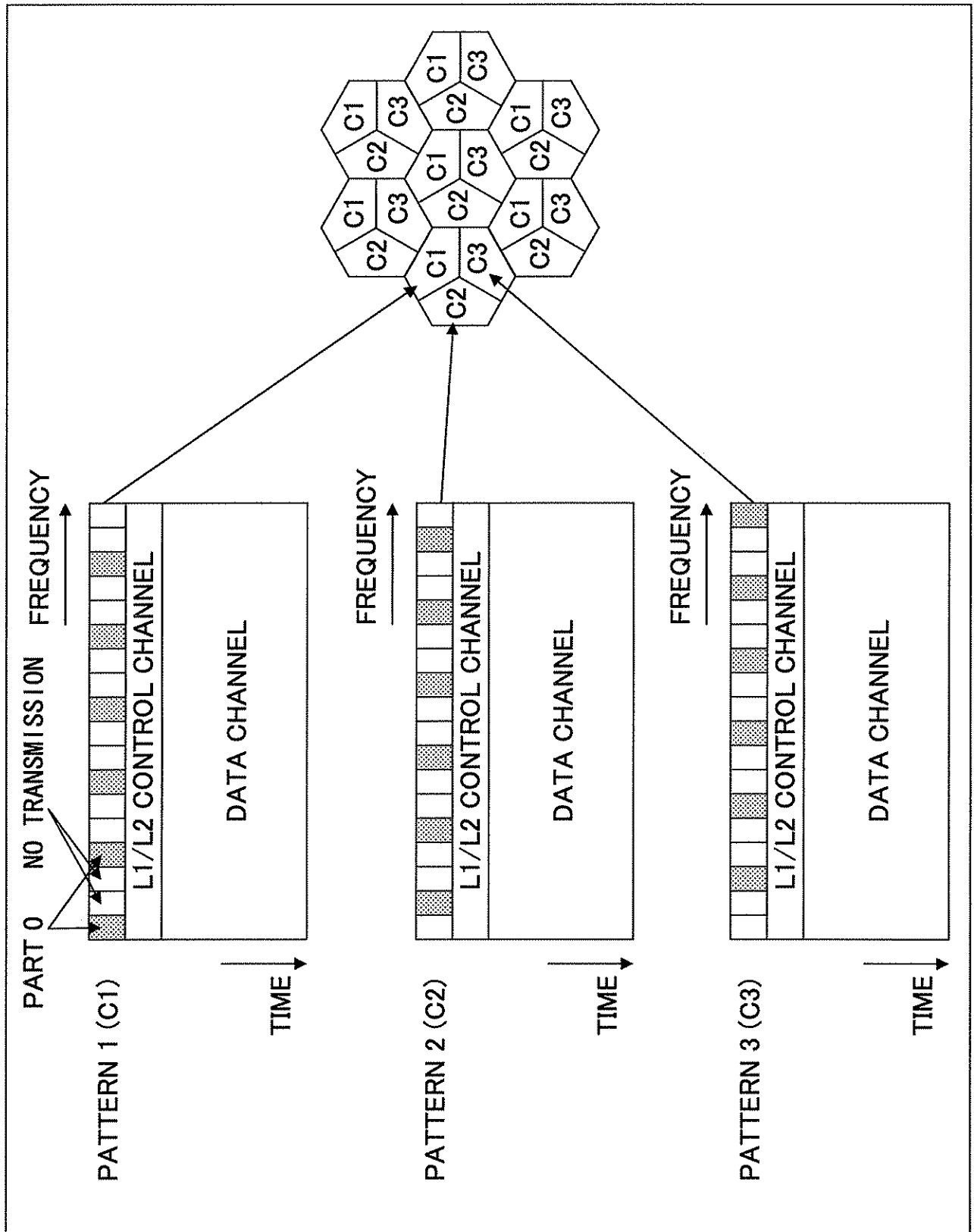


FIG.7D





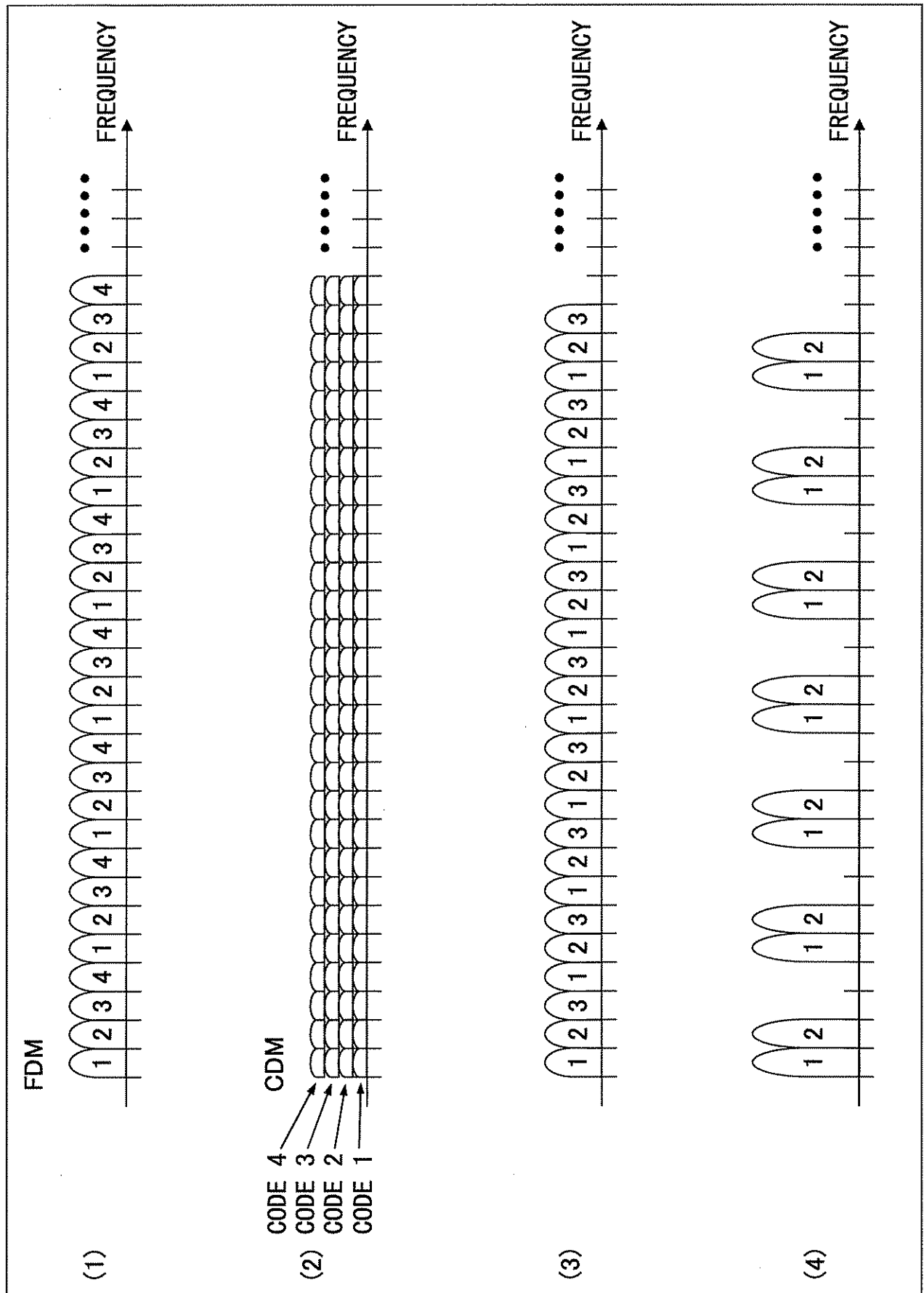


FIG.7F

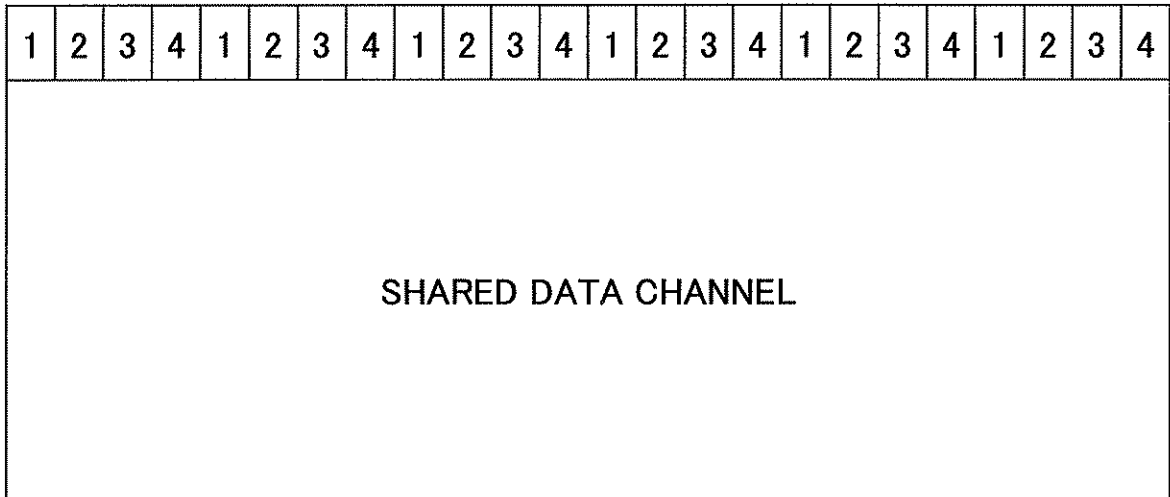
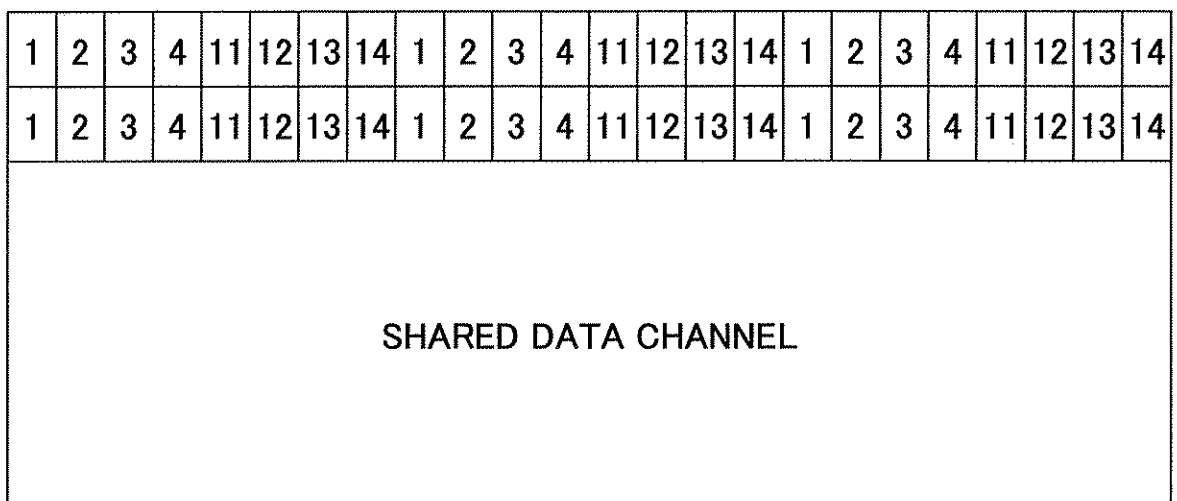
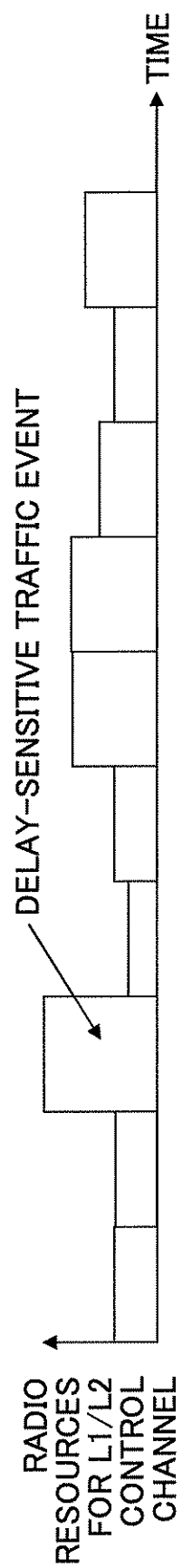
FIG.7G**FIG.7H**

FIG. 7I



DELAY-SENSITIVE TRAFFIC EVENT

TIME

FIG.7J

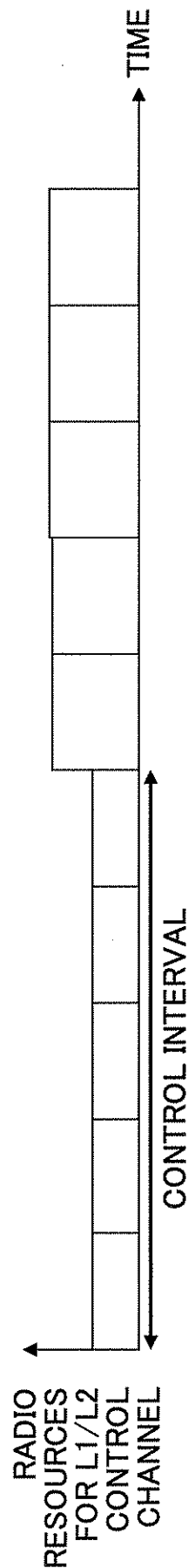


FIG. 7K

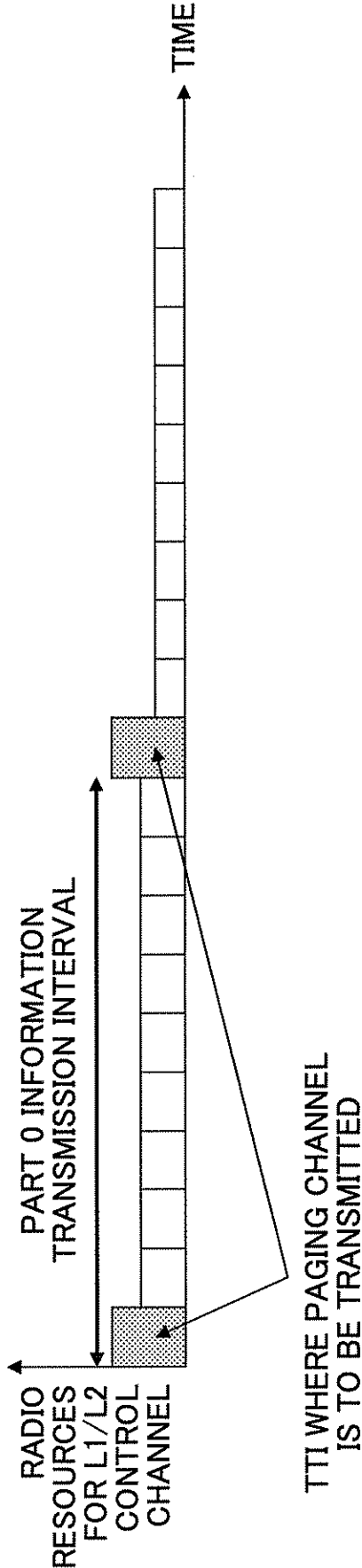


FIG. 7L

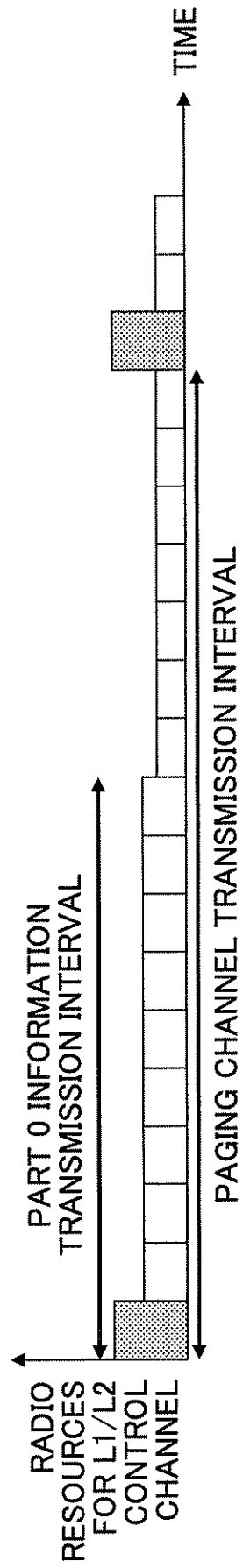


FIG.7M

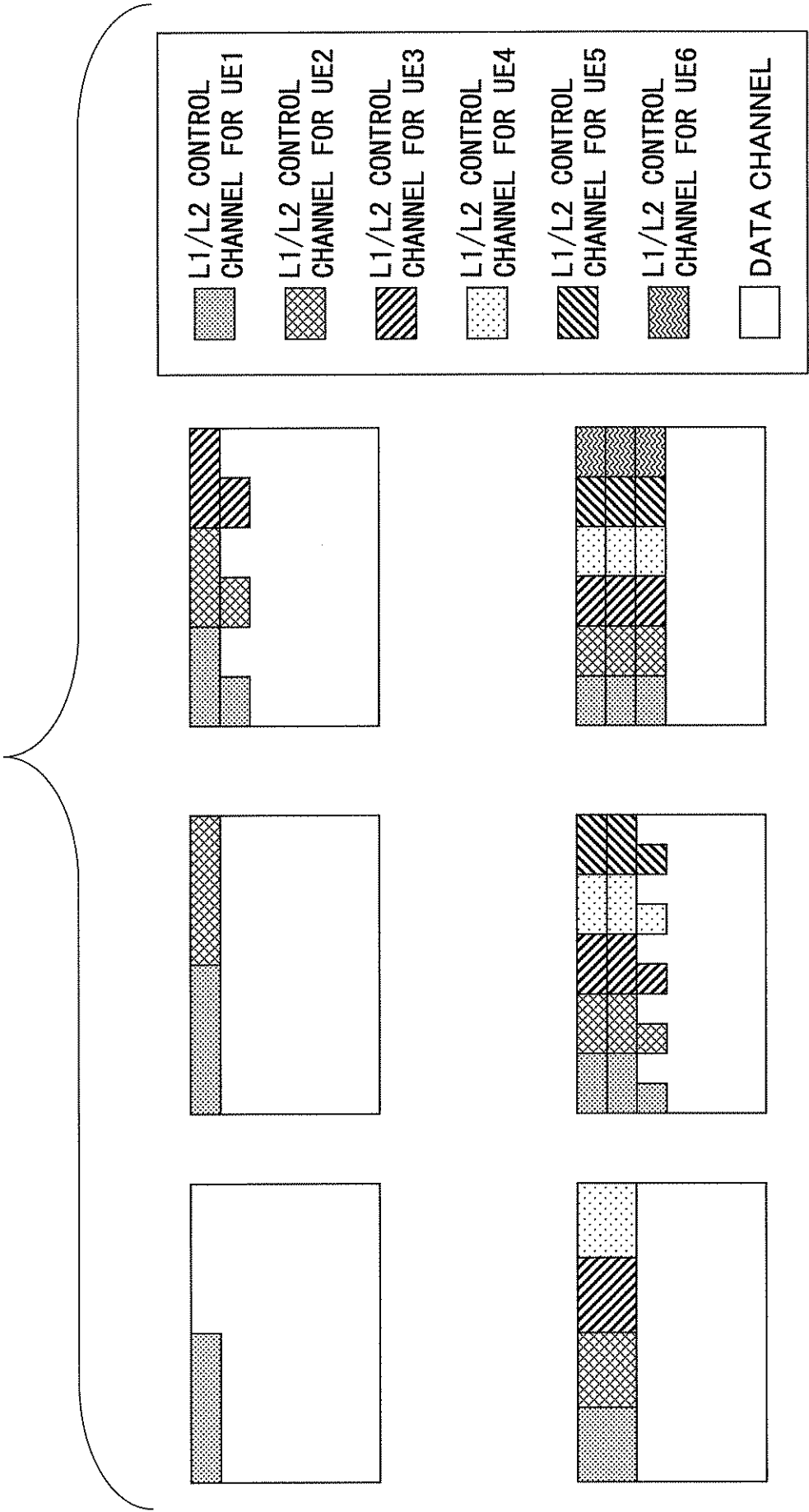


FIG.7N

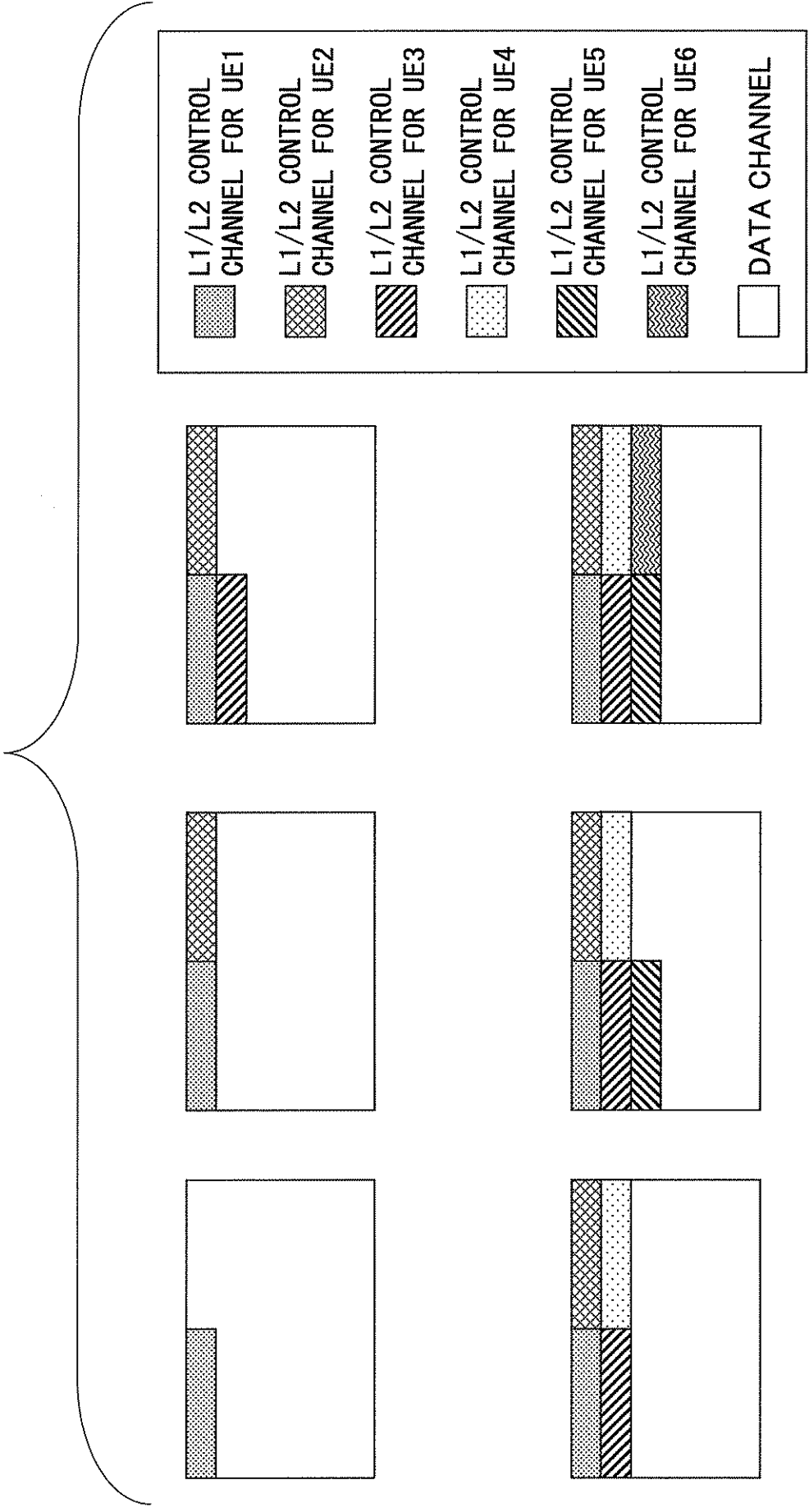


FIG.70

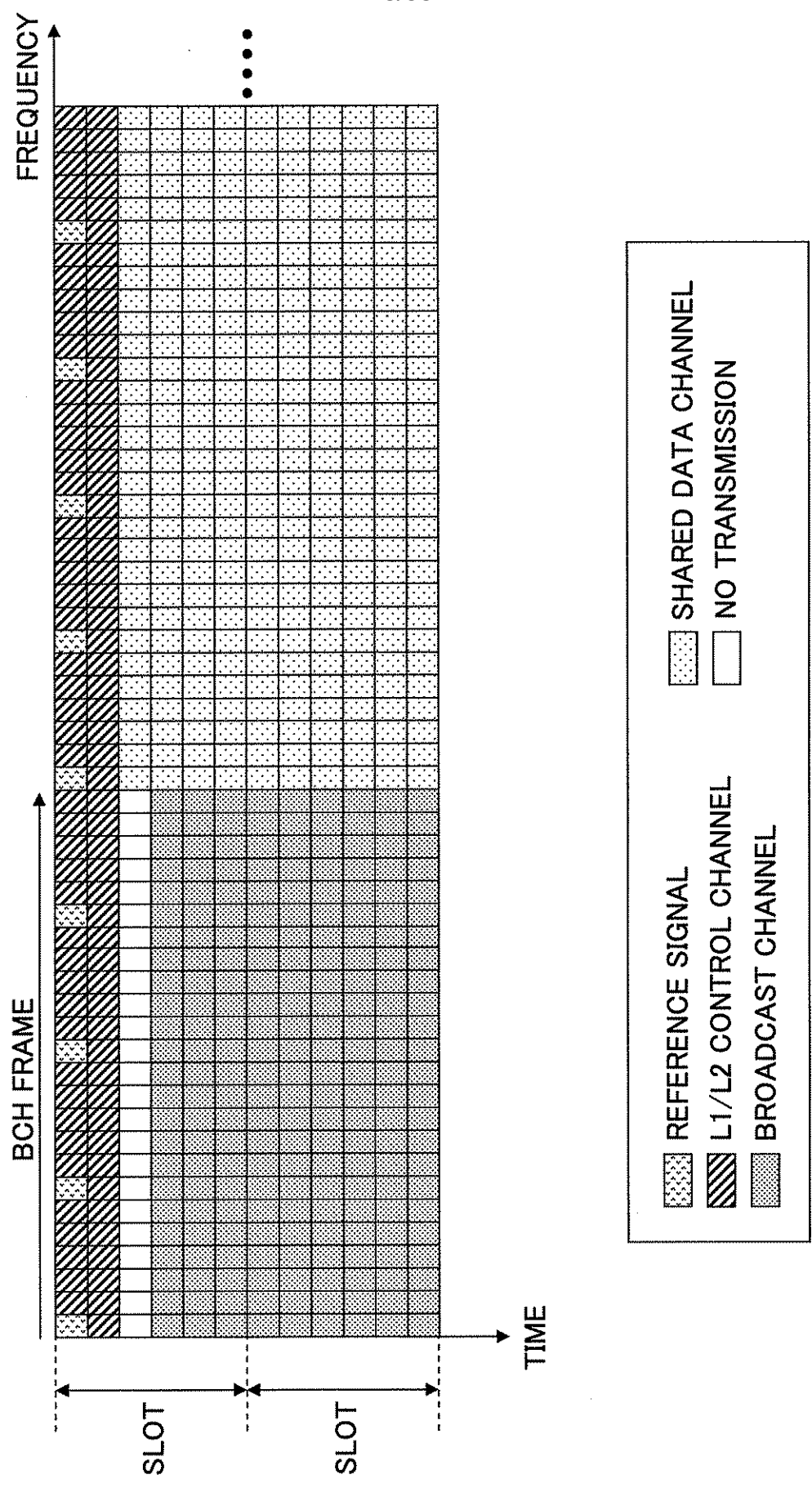


FIG.8A

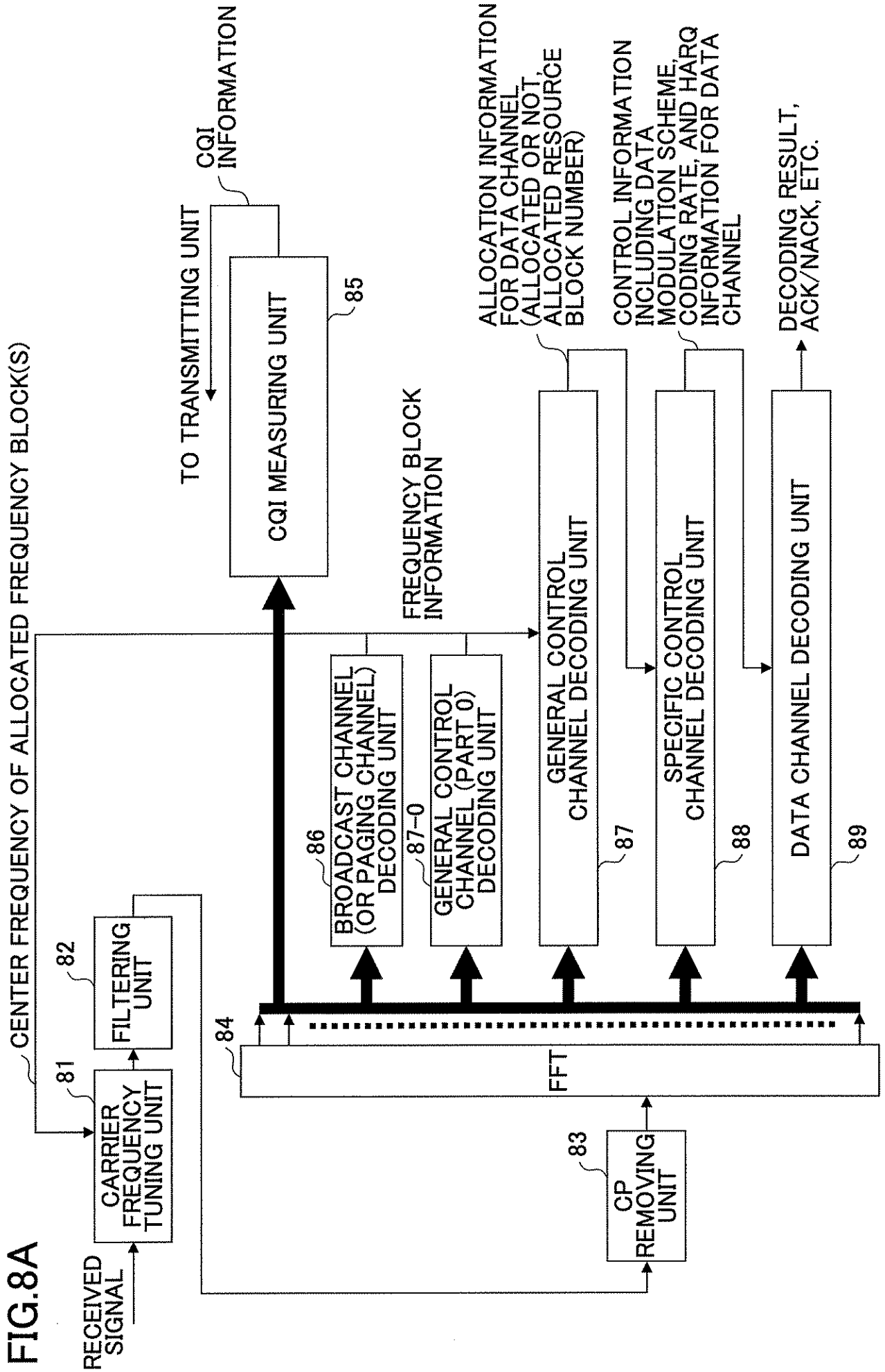


FIG.8B

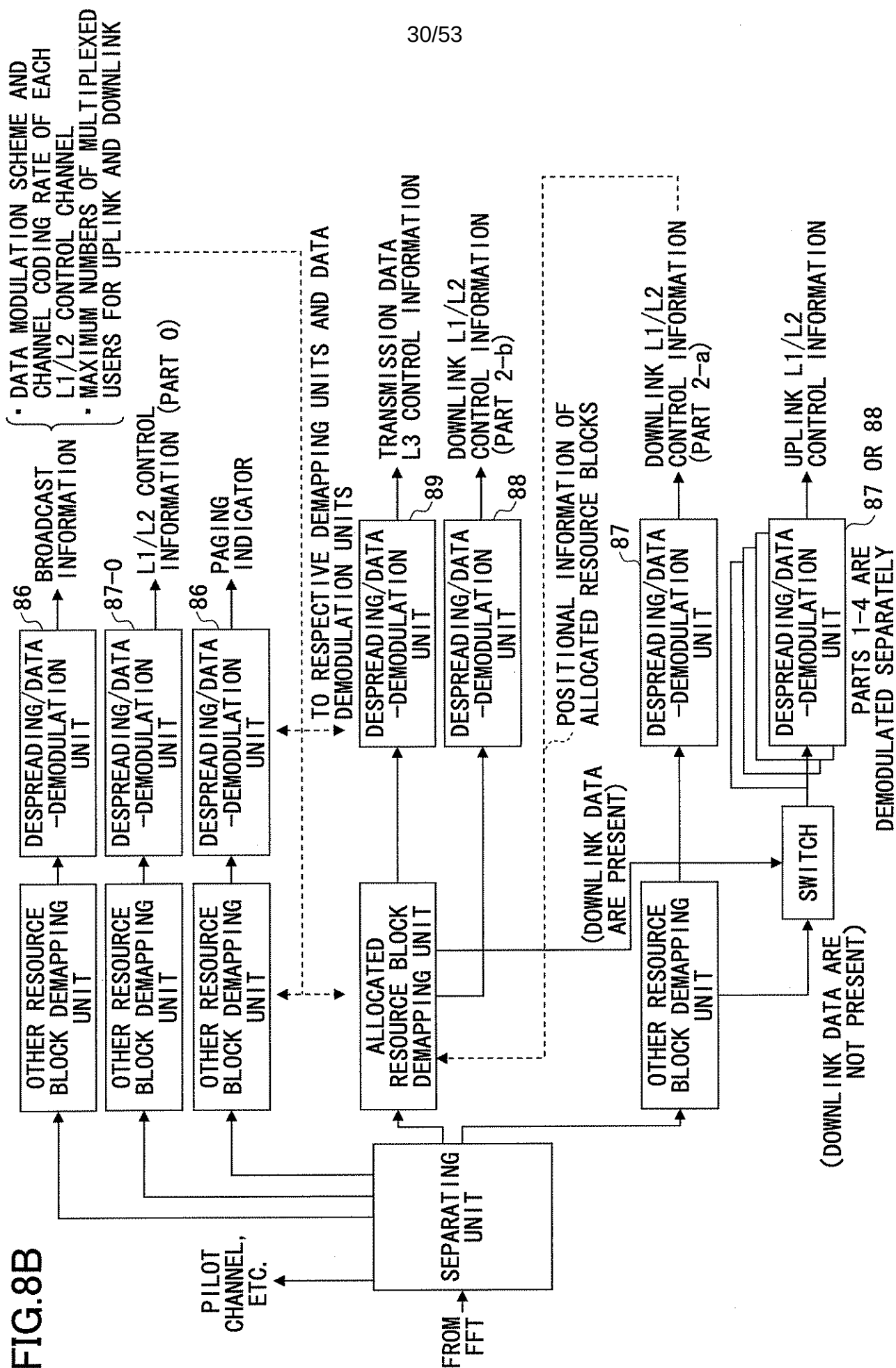


FIG.8C

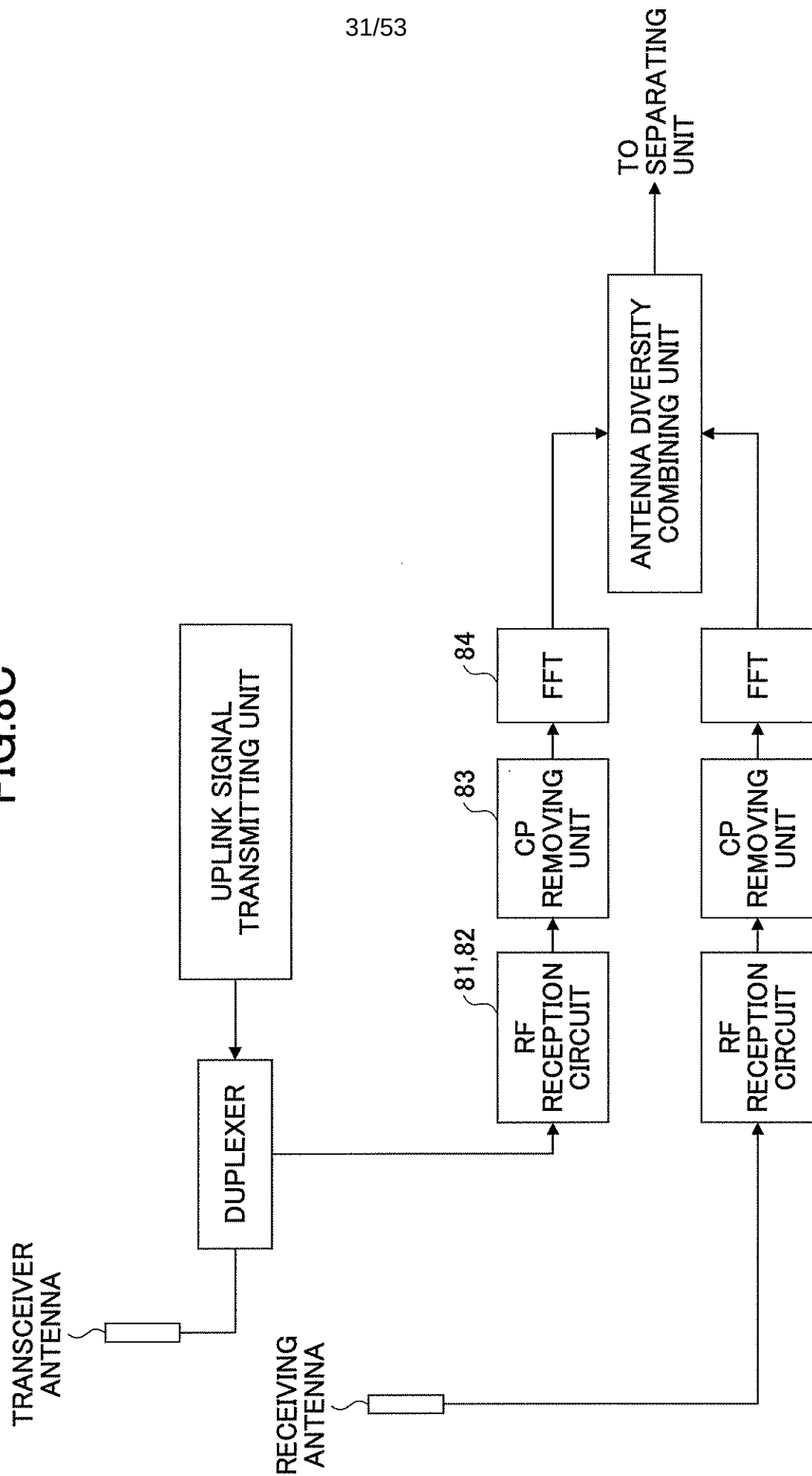


FIG.8D

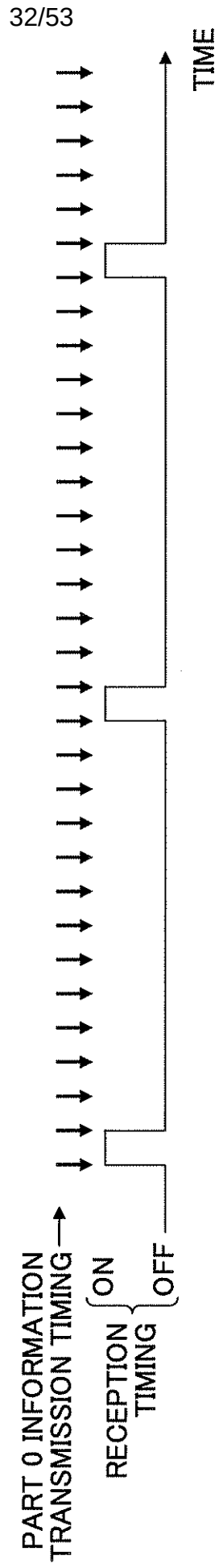


FIG.8E

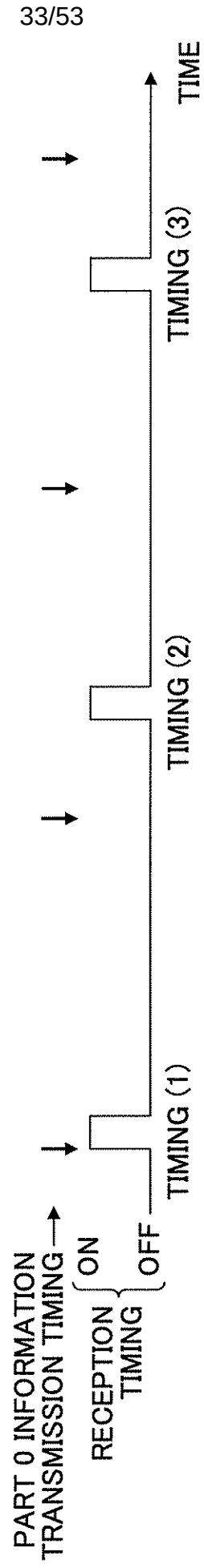


FIG.8F

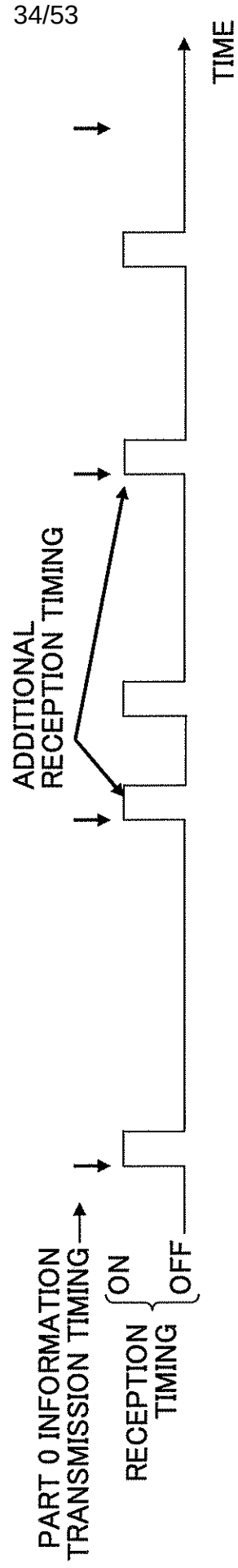


FIG.9A

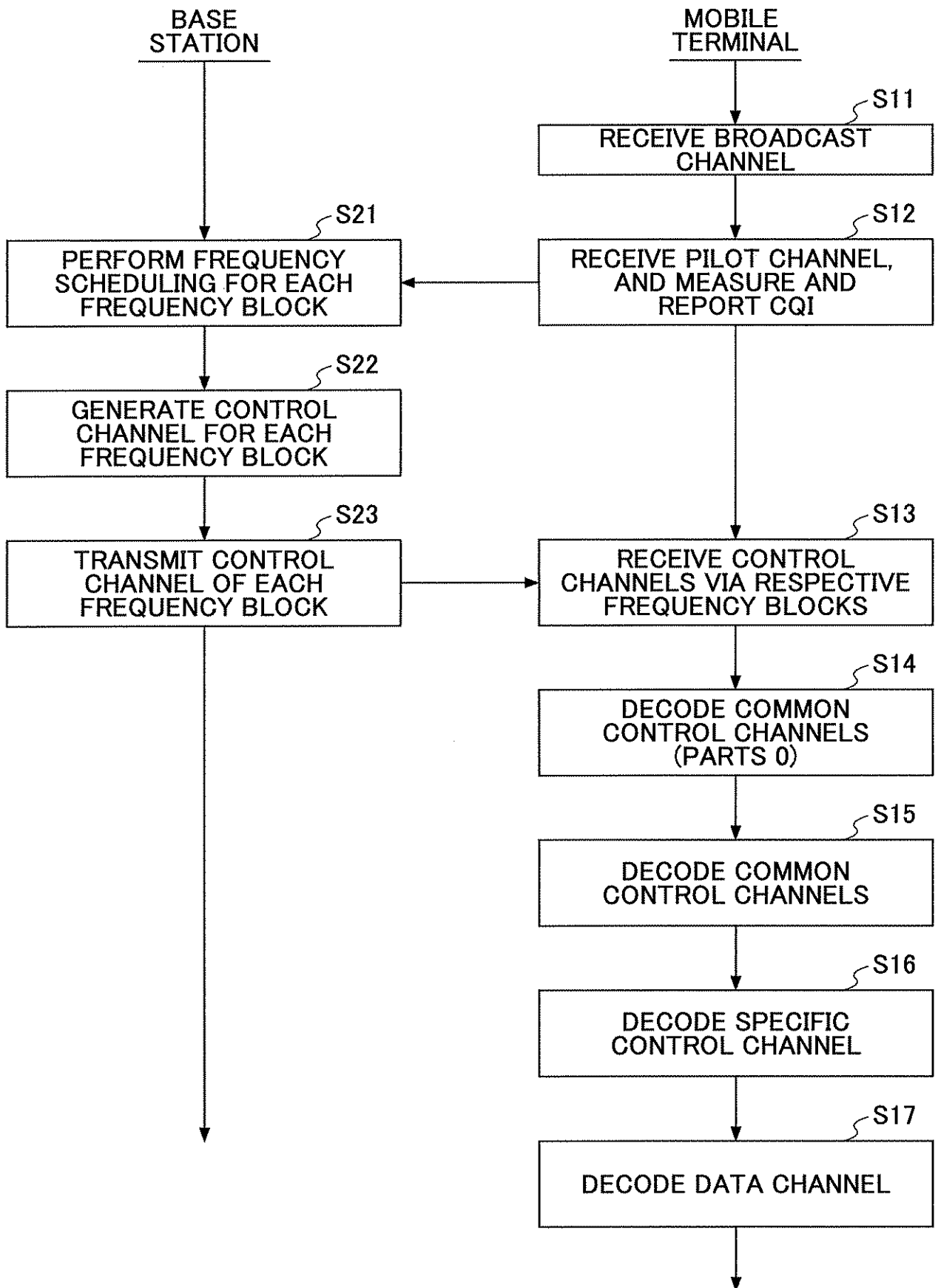


FIG.9B

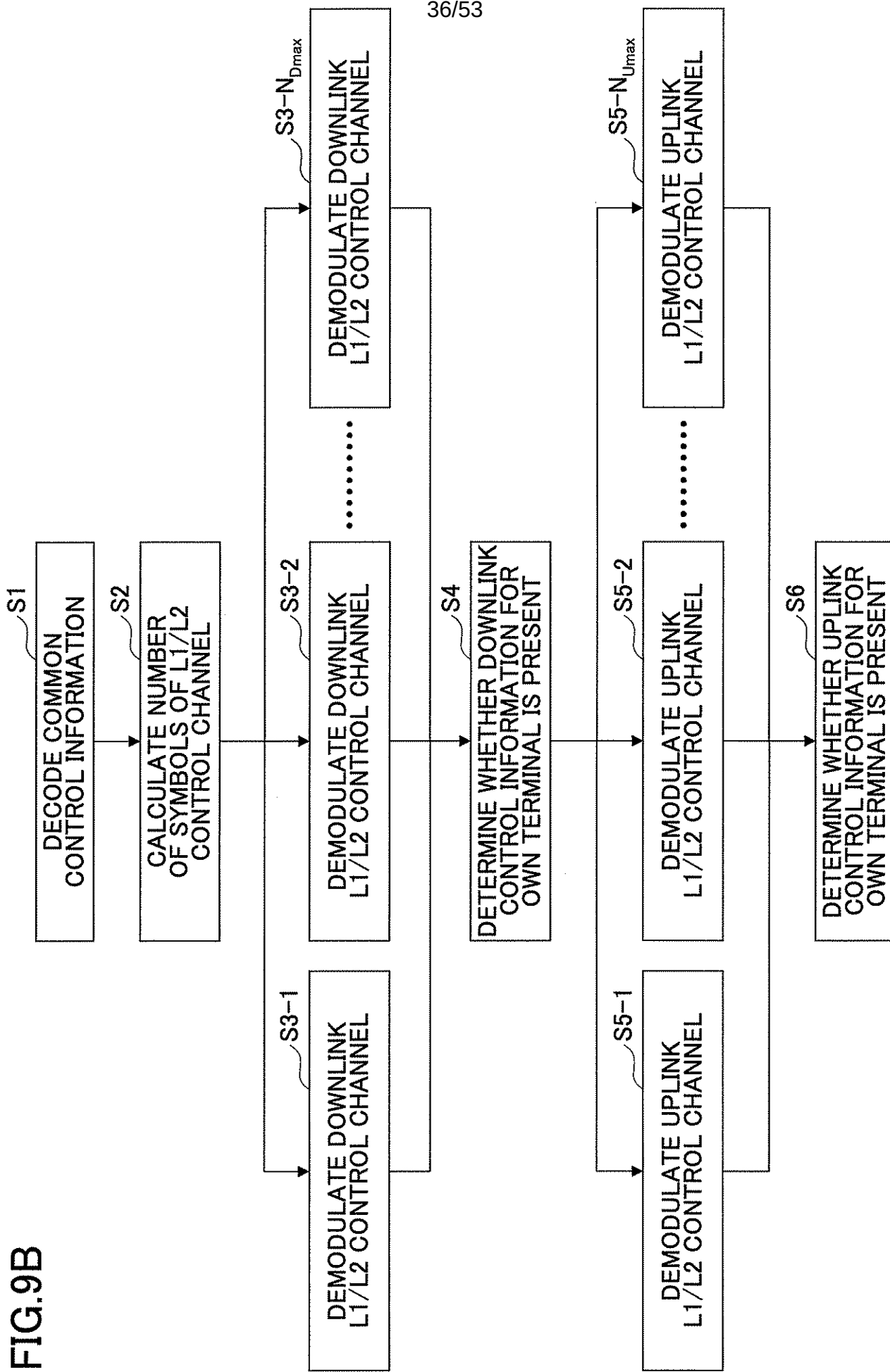


FIG.9C

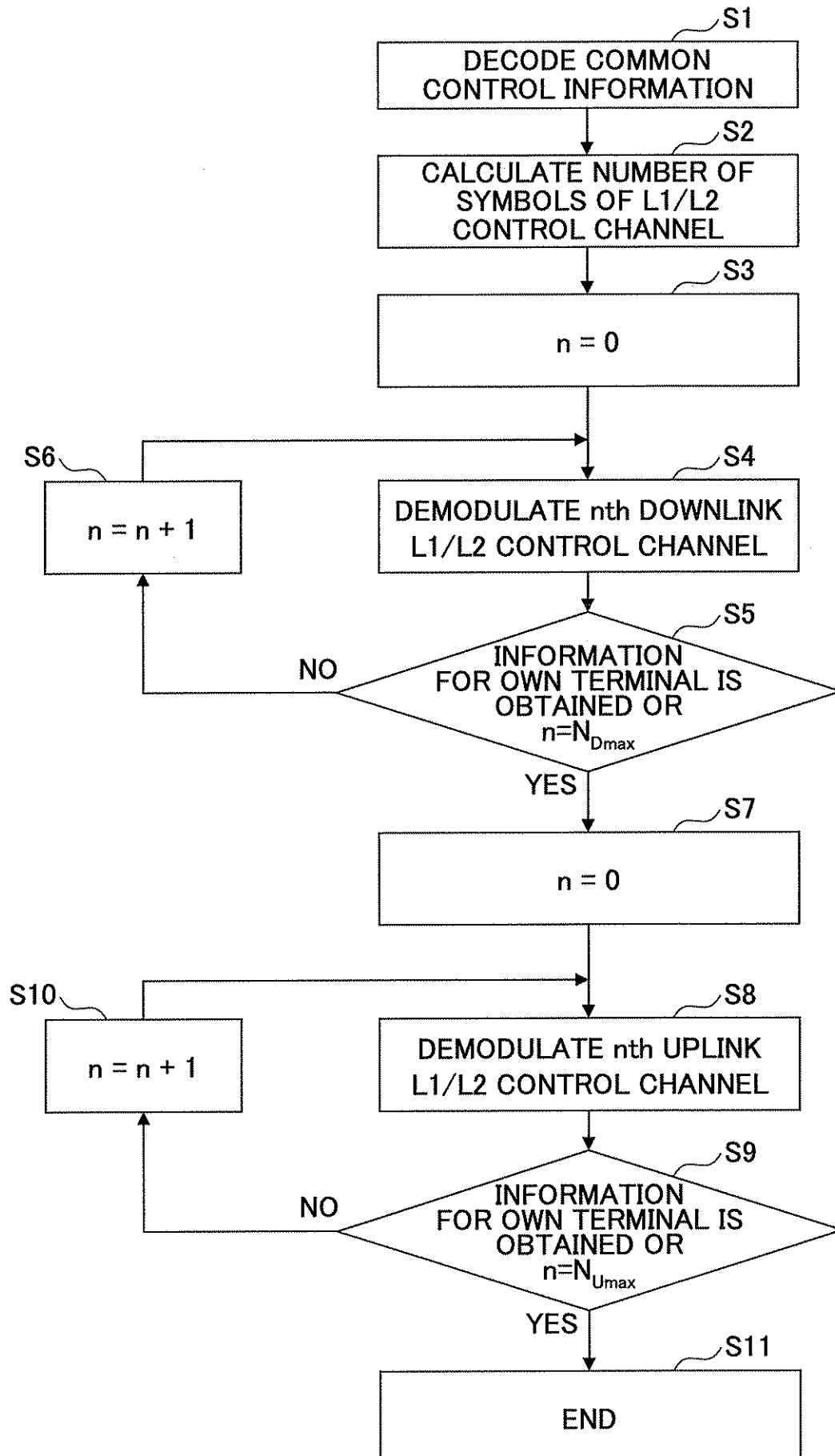


FIG.10A

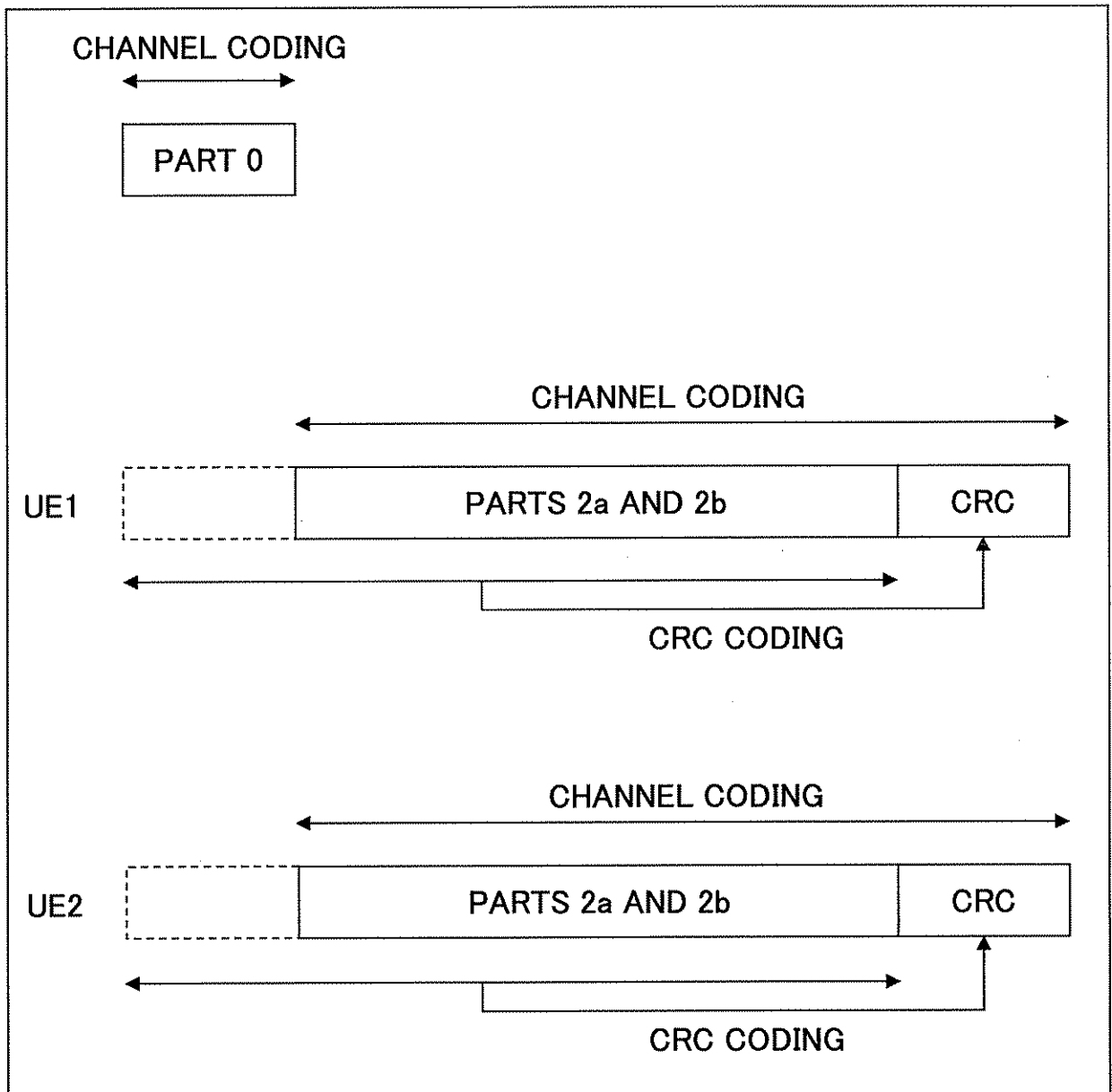


FIG.10B

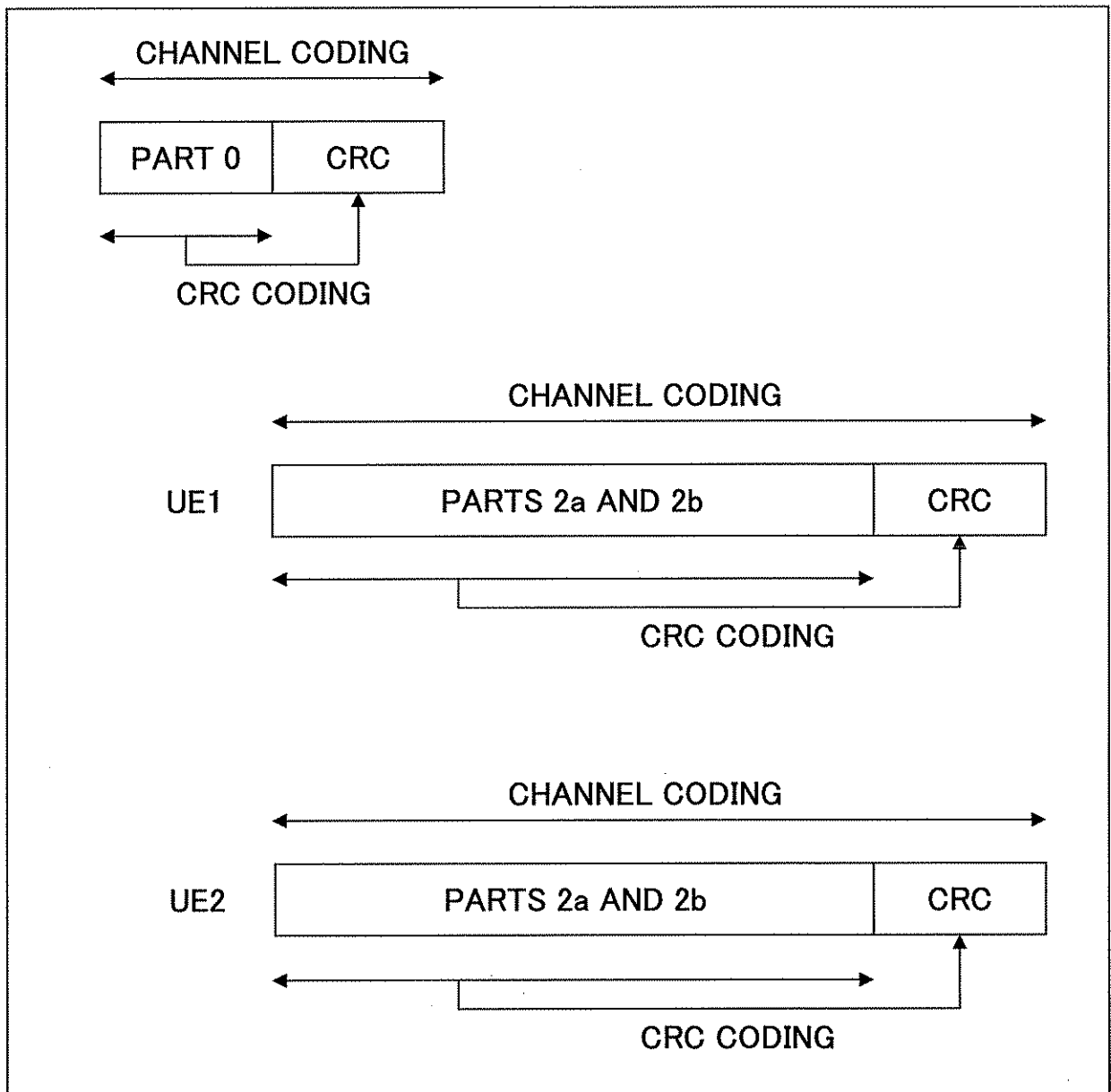


FIG.10C

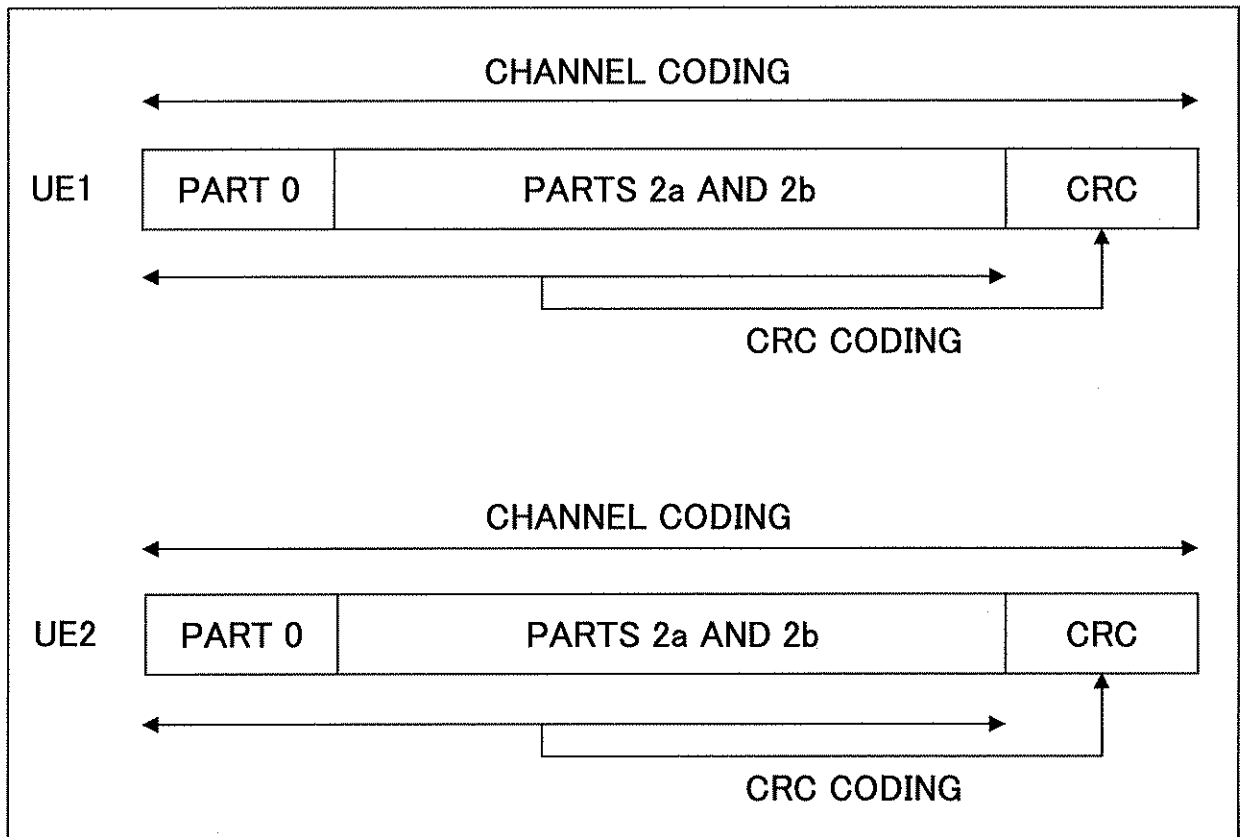


FIG.11

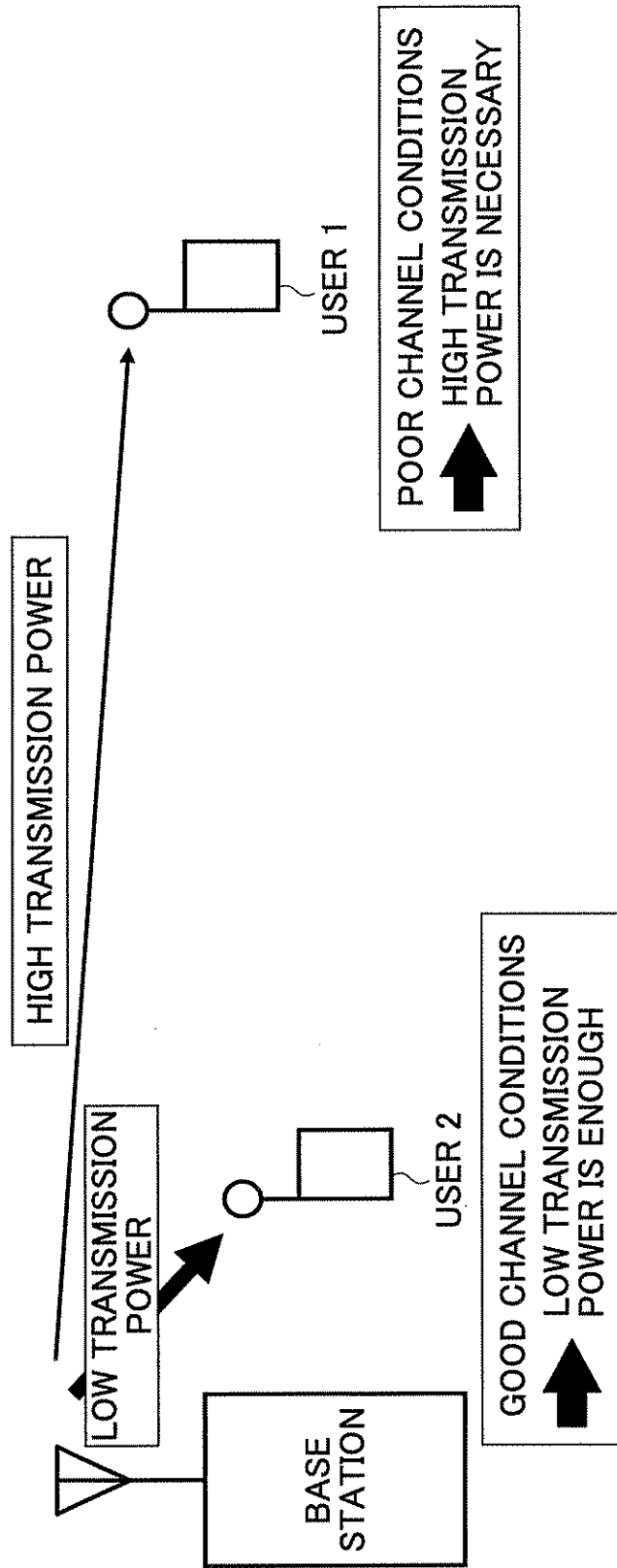


FIG.12

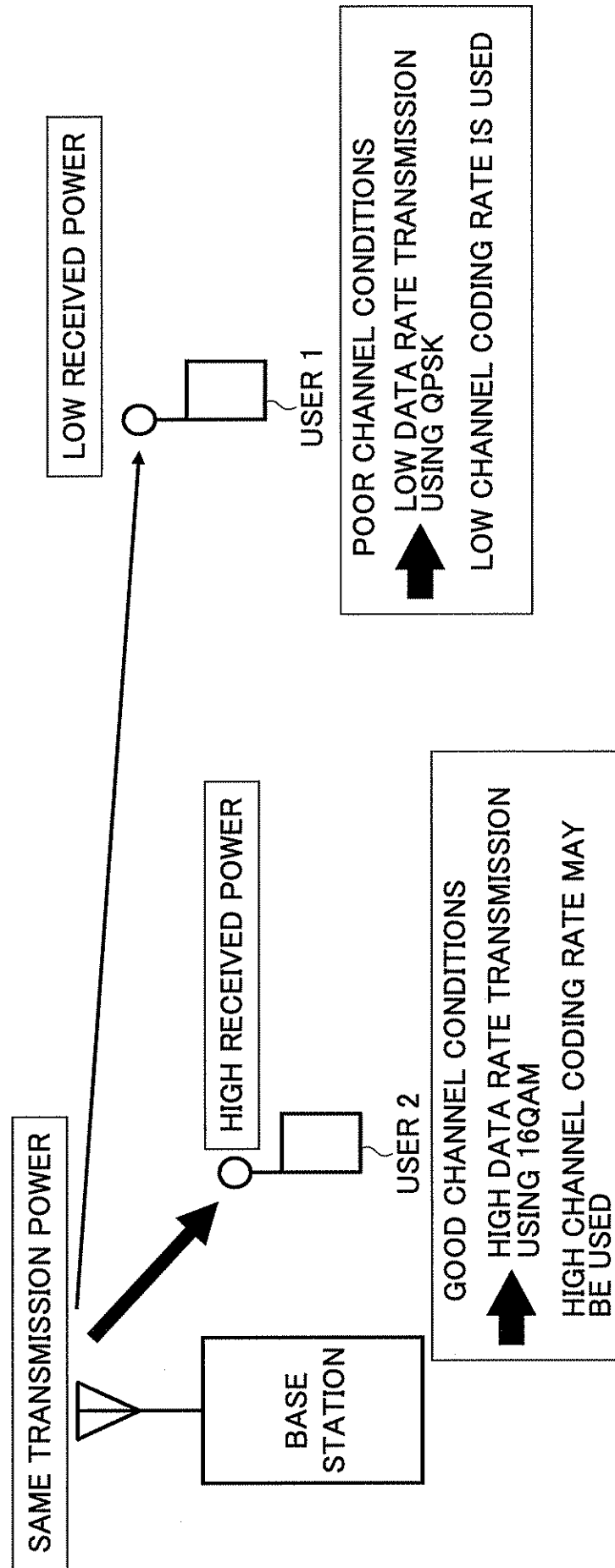


FIG.13

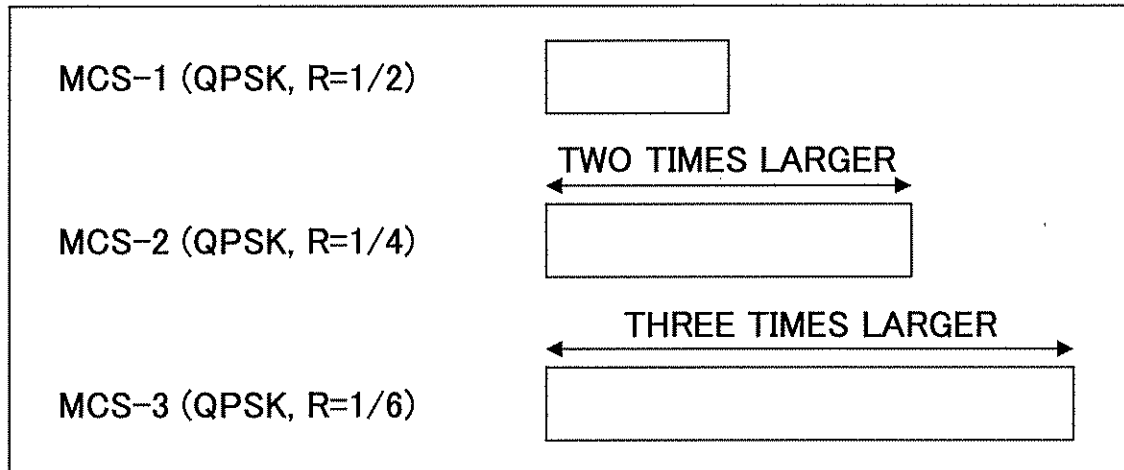


FIG.14A

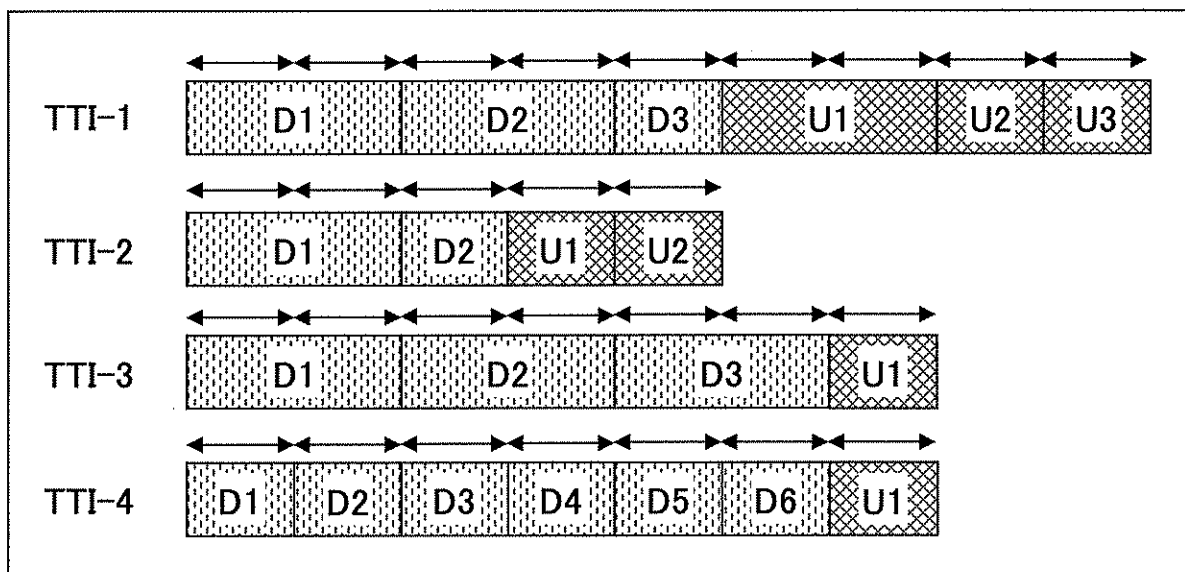


FIG.14B

	$N_{L1/L2(max)}$	$N_{UE,D}$		$N_{UE,U}$		N_D	N'_D	N_U	N'_U
		MCS1	MCS2	MCS1	MCS2				
TTI-1	9	1	2	2	1	3	5	3	4
TTI-2	5	1	2	2	0	2	3	2	2
TTI-3	7	0	3	1	0	3	6	1	1
TTI-4	7	6	0	1	0	6	6	1	1

FIG.15

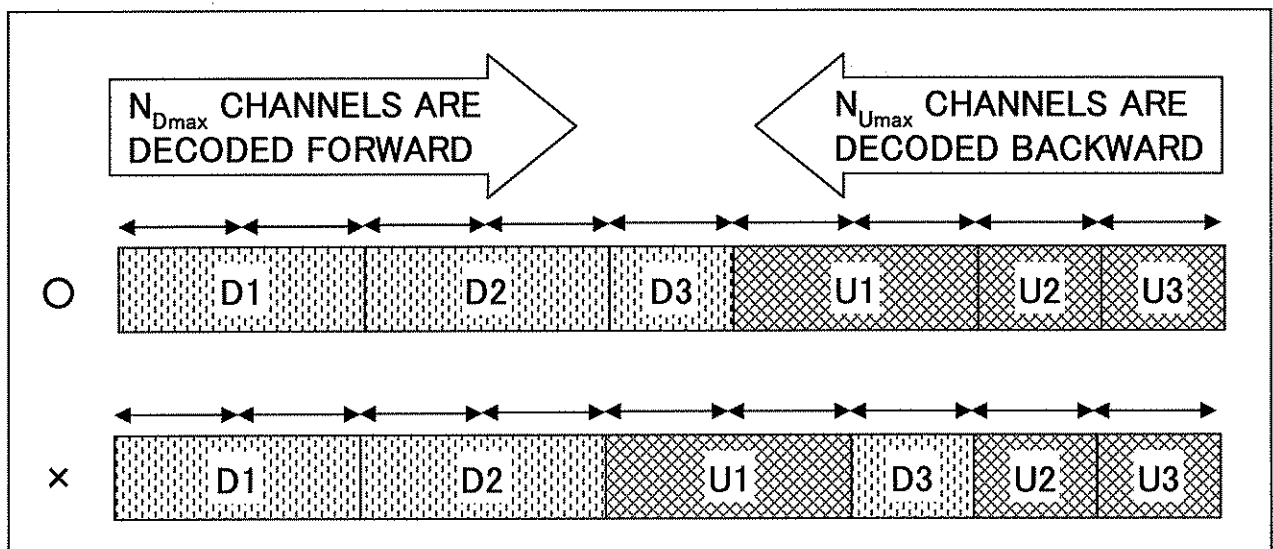


FIG.16

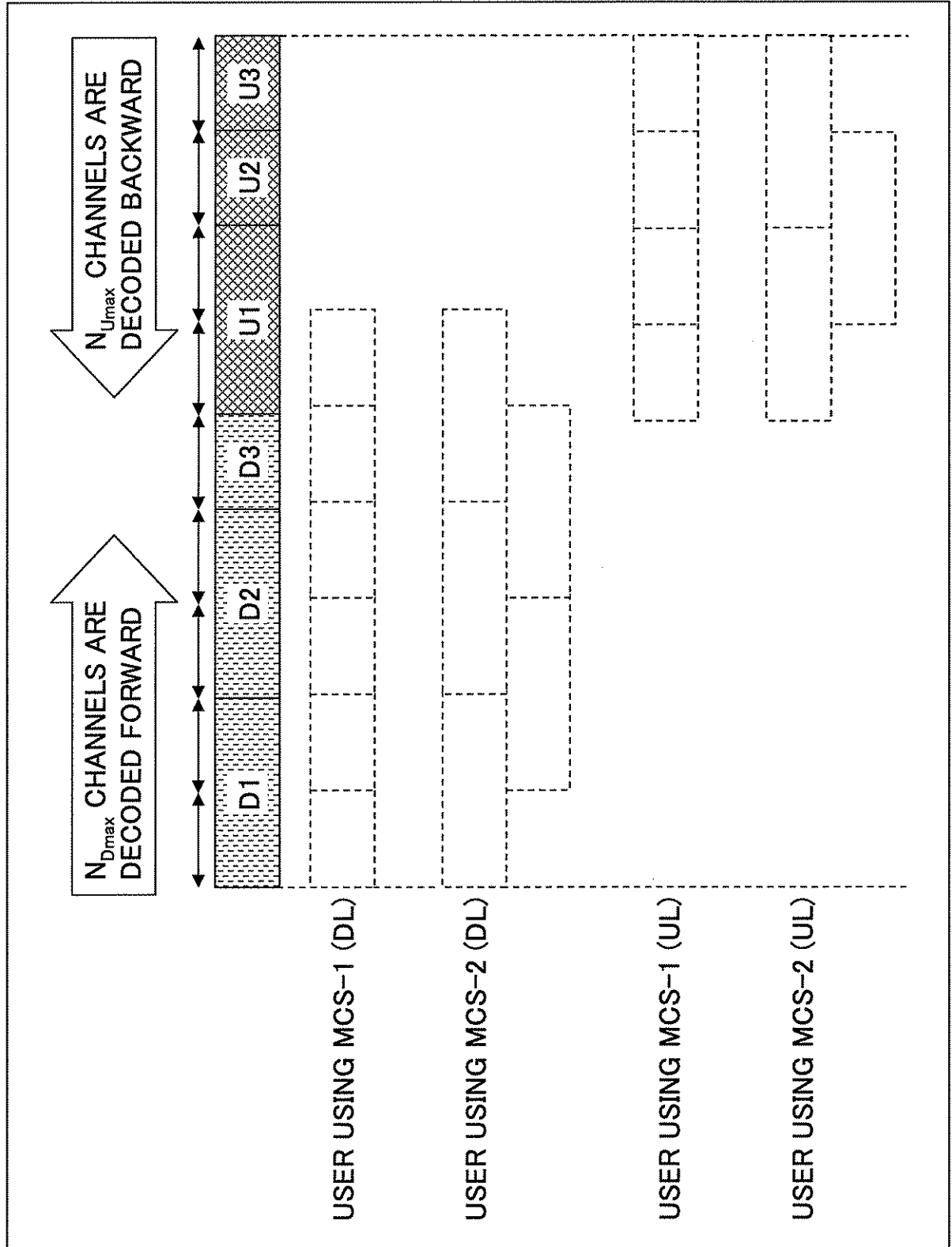


FIG.17

	METHOD 1	METHOD 2	METHOD 3	METHOD 4	METHOD 5	METHOD 6	METHOD 7
L1/L2 CONTROL INFORMATION (EVERY TTI)	$N_{UE,D}(m),$ $N_{UE,U}(m)$	N'_D, N'_U	$N'_D + N'_U$	N'_D, N'_U	$N'_D + N'_U$	$N'_D + N'_U$	$N'_D + N'_U$
L3 CONTROL INFORMATION (LONGER INTERVAL)	—	—	—	MCS	MCS	MCS	—
BCH (LONGER INTERVAL)	—	—	—	—	—	N_{Dmax}, N_{Umax}	N_{Dmax}, N_{Umax}
NUMBER OF BLIND DETECTION STEPS	$N_D + N_U$	$N_{MCS} \times$ $(N'_D + N'_U)$	$2 \times N_{MCS} \times$ $(N'_D + N'_U)$	$N'_D + N'_U$	$2 \times (N'_D + N'_U)$	$N_{Dmax} + N_{Umax}$	$N_{Dmax} + N_{Umax}$
RADIO RESOURCE EFFICIENCY	⊙	⊙	⊙	○	○	○	△

FIG.18

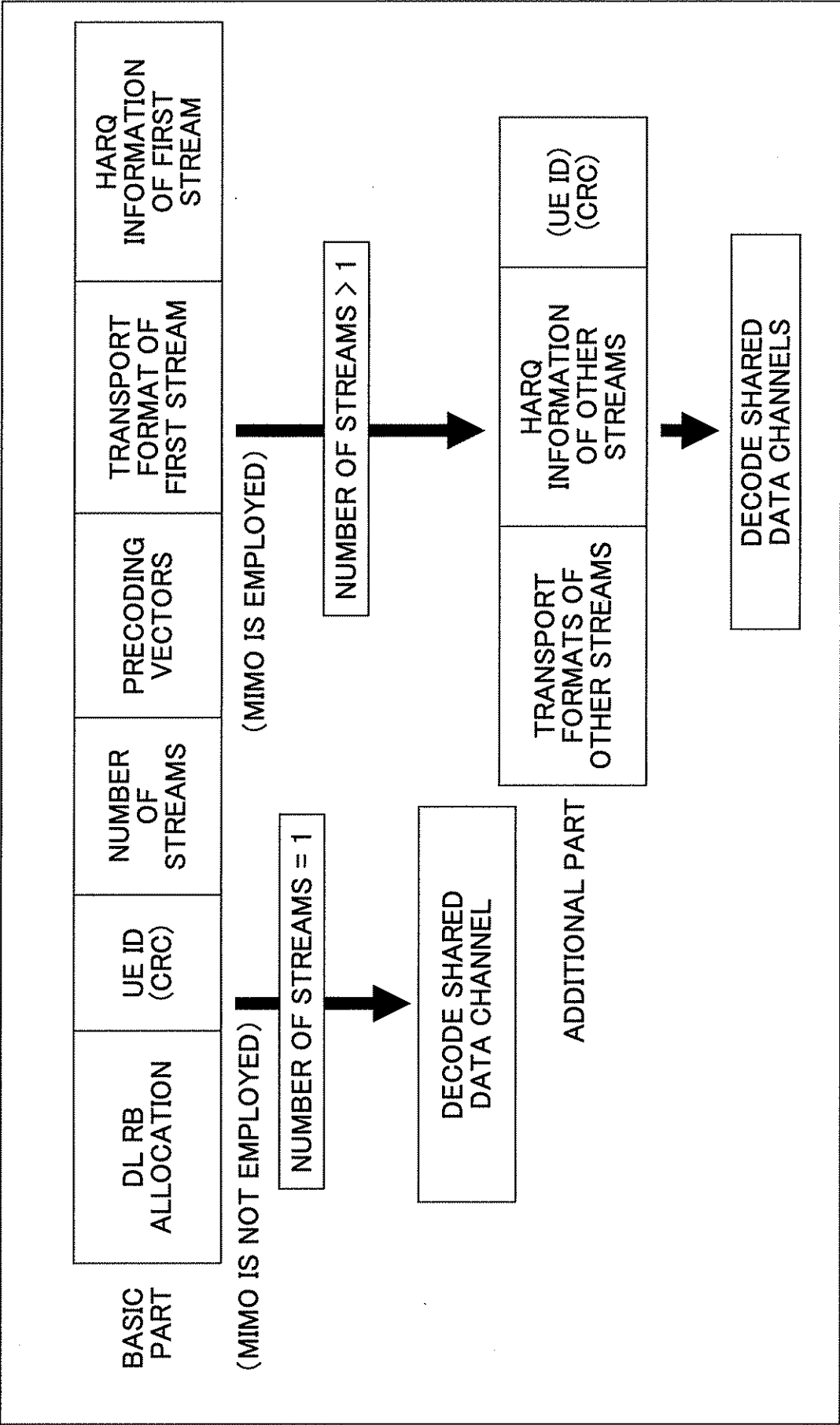


FIG.19A



FIG.20

DL RB ALLOCATION	UE ID (CRC)	NUMBER OF STREAMS	PRECODING VECTORS	TRANSPORT FORMATS OF ALL STREAMS	HARQ INFORMATION OF ALL STREAMS
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FIG.21

	FIRST METHOD BASIC PART AND ADDITIONAL PART ARE CODED SEPARATELY	SECOND METHOD FIXED-LENGTH PART AND VARIABLE- LENGTH PART ARE CODED SEPARATELY	THIRD METHOD ALL CONTROL INFORMATION ITEMS ARE CODED COLLECTIVELY
CHANNEL CODING GAIN	CODING GAIN OF BASIC PART IS HIGH AND CODING GAIN OF ADDITIONAL PART IS LOW	MEDIUM	HIGH
DECODING DELAY	DECODING DELAY OF NON-MIMO USER IS SMALL BECAUSE DECODING PROCESS IS REPEATED ONLY ONCE, AND DECODING DELAY OF MIMO USER IS LARGE BECAUSE DECODING PROCESS IS REPEATED MULTIPLE TIMES	DECODING DELAY IS LARGE BECAUSE DECODING PROCESS IS REPEATED MULTIPLE TIMES	DECODING DELAY IS SMALL BECAUSE DECODING PROCESS IS REPEATED ONLY ONCE
NUMBER OF BLIND DETECTION STEPS (WHEN PRECODING INFORMATION, FORMAT TRANSPORT FORMAT INFORMATION, AND HARQ INFORMATION ARE NOT FIXED)	NUMBER OF BLIND DETECTION STEPS FOR BASIC PART MAY BECOME LARGE	NUMBER OF BLIND DETECTION STEPS IS SMALL BECAUSE DATA SIZES OF ALL PARTS ARE KNOWN	NUMBER OF BLIND DETECTION STEPS MAY BECOME LARGE
OVERHEAD (WHEN PRECODING INFORMATION, AND TRANSPORT FORMAT INFORMATION, AND HARQ INFORMATION ARE FIXED TO REDUCE THE NUMBER OF BLIND DETECTION STEPS)	OVERHEAD MAY BECOME SLIGHTLY LARGER BECAUSE OF DUMMY BITS USED TO FIX SIZE OF PRECODING INFORMATION	SMALL	OVERHEAD MAY BECOME LARGER BECAUSE OF DUMMY BITS USED TO FIX SIZES OF PRECODING INFORMATION, TRANSPORT FORMAT INFORMATION, AND HARQ INFORMATION

FIG.22

CONTROL SIGNALING INFORMATION	NUMBER OF BITS	DESCRIPTIONS (ASSUMPTIONS)
DOWNLINK RESOURCE ALLOCATION INFORMATION	$N_{RB}/2$	BIT MAPPING FOR EACH PAIR OF ADJACENT TWO RBs IS USED
UE ID	16	=CRC
NUMBER OF SPATIAL STREAMS	2	FOUR STREAMS
PRECODING VECTOR INFORMATION	$[3]N_{precoding}$ (2 ANTENNAS) $[4-6]N_{precoding}$ (4 ANTENNAS)	PRELIMINARY VALUE FFS
TRANSPORT FORMAT INFORMATION	$8N_{codeword}$	TWO BITS ARE PROVIDED FOR MODULATION SCHEME AND SIX BITS ARE PROVIDED FOR PAYLOAD SIZE FOR EACH CODE WORD CONTROL (FFS)
HARQ INFORMATION	$5N_{codeword}$	THREE BITS ARE PROVIDED FOR PROCESS NUMBER, AND TWO BITS ARE PROVIDED FOR REDUNDANCY VERSION AND NEW DATA INDICATOR
UPLINK RESOURCE ALLOCATION INFORMATION	$\log_2(N_{RB}(N_{RB}+1)/2)$	TREE MAPPING
UE ID	16	=CRC
TRANSPORT FORMAT INFORMATION	8	TWO BITS ARE PROVIDED FOR MODULATION SCHEME AND SIX BITS ARE PROVIDED FOR PAYLOAD SIZE
TRANSMISSION POWER	[1-4]	SELECTED FROM 2-16 POWER OFFSET VALUES (FFS)
REFERENCE SIGNAL FORMAT INFORMATION FOR DECODING	[2]	SELECTED FROM FOUR CYCLIC SHIFT VALUES (FFS)

N_{RB} : NUMBER OF RESOURCE BLOCKS IN SYSTEM FREQUENCY BAND (e.g., 50 RESOURCE BLOCKS IN 10 MHz BAND)

$N_{precoding}$: NUMBER OF FREQUENCY BLOCKS OF PRECODING CONTROL UNIT TO WHICH ALLOCATED RBs BELONG

$N_{codeword}$: NUMBER OF CODE WORDS (ONE FOR ONE STREAM, AND TWO FOR 2-4 STREAMS)

FIG.23

NUMBER OF SYMBOLS PER DL SCHEDULING GRANT INFORMATION (IT IS ASSUMED THAT DUMMY BITS ARE ADDED TO FIX CODE BLOCK SIZE OF BASIC PART (FIXED PART) IN FIRST AND SECOND METHODS)									
CONDITIONS	5 MHz BAND			10 MHz BAND			20 MHz BAND		
	FIRST METHOD	SECOND METHOD	THIRD METHOD	FIRST METHOD	SECOND METHOD	THIRD METHOD	FIRST METHOD	SECOND METHOD	THIRD METHOD
CASE A Min/Max B = 3 / 4 Min/Max N_{codeword} = 1 / 2	BASIC:47-48 ADDITIONAL: 0-13 (1.14-1.45%)	FIXED:15 VARIABLE: 32-46 (1.12-1.45%)	47-61 (1.45%)	BASIC:59-60 ADDITIONAL: 0-13 (0.71-0.87%)	FIXED:27 VARIABLE: 32-46 (0.70-0.87%)	59-73 (0.87%)	BASIC:84-85 ADDITIONAL: 0-13 (0.51-0.58%)	FIXED:52 VARIABLE: 32-46 (0.50-0.58%)	84-98 (0.58%)
CASE B Min/Max B = 3 / (4 x $N_{RB}/5$) Min/Max N_{codeword} = 1 / 2	BASIC:47-64 ADDITIONAL: 0-13 (1.52-1.83%)	FIXED:15 VARIABLE: 32-62 (1.12-1.83%)	47-77 (1.83%)	BASIC:59-96 ADDITIONAL: 0-13 (1.14-1.30%)	FIXED:27 VARIABLE: 32-82 (0.70-1.30%)	59-109 (1.30%)	BASIC:84-161 ADDITIONAL: 0-13 (0.96-1.04%)	FIXED:52 VARIABLE: 32-122 (0.50-1.04%)	84-174 (1.04%)