

Field	Size (bits)	Meaning
SNR in receive chain 1	8	Signal-to-noise ratio in the first receive chain of the STA sending the report.
...		
SNR in receive chain N_r	8	Signal-to-noise ratio in the N_r -th receive chain of the STA sending the report.
CSI Matrix for carrier -28	$3+2 \times N_b \times N_c \times N_r$	CSI matrix (see Figure 9-112 (CSI matrix coding))
...		
CSI Matrix for carrier -1	$3+2 \times N_b \times N_c \times N_r$	CSI matrix
CSI Matrix for carrier 1	$3+2 \times N_b \times N_c \times N_r$	CSI matrix
...		
CSI Matrix for carrier 28	$3+2 \times N_b \times N_c \times N_r$	CSI matrix

Table 9-56—CSI Report field (20 MHz)

Figure 1A

CSI Field Parameters	Meaning	Range of Values
N_b	Number of Bits for I or Q	{4, 5, 6, 8}
N_c	Number of Columns	0 to 3
N_r	Number of Rows	1 to 4
N_g	Grouping	{1, 2, 4}

Figure 1B

100

102

Table 9-91e—Subcarrier indices for compressed beamforming feedback matrix

Channel width	N_g	Superset of subcarrier indices ($scidx$)
20 MHz	4	-122, -120, -116, ..., -8, -4, -2, 2, 4, 8, ..., 116, 120, 122
	16	-122, -116, -100, ..., -20, -4, -2, 2, 4, 20, ..., 100, 116, 122
40 MHz	4	-244, -240, ..., -8, -4, 4, 8, ..., 240, 244
	16	-244, -228, ..., -20, -4, 4, 20, ..., 228, 244
80 MHz	4	-500, -496, ..., -8, -4, 4, 8, ..., 496, 500
	16	-500, -484, ..., -20, -4, 4, 20, ..., 484, 500
160 MHz	4	-1012, -1008, ..., -520, -516, -508, -504, ..., -16, -12, 12, 16, ..., 504, 508, 516, 520, ..., 1008, 1012
	16	-1012, -996, ..., -532, -516, -508, -492, ..., -28, -12, 12, 28, ..., 492, 508, 516, 532, ..., 996, 1012
80+80 MHz	4	-500(L), -496(L), ..., -8(L), -4(L), 4(L), 8(L), ..., 496(L), 500(L), -500(H), -496(H), ..., -8(H), -4(H), 4(H), 8(H), ..., 496(H), 500(H)
	16	-500(L), -484(L), ..., -20(L), -4(L), 4(L), 20(L), ..., 484(L), 500(L), -500(H), -484(H), ..., -20(H), -4(H), 4(H), 20(H), ..., 484(H), 500(H)
NOTE 1— $x(L)$ denotes subcarrier index x in the frequency segment lower in frequency, and $x(H)$ denotes subcarrier index x in the frequency segment higher in frequency.		
NOTE 2—"..." denotes an arithmetic progression in N_g increments.		
NOTE 3—Pilot subcarriers are not skipped.		

Figure 2

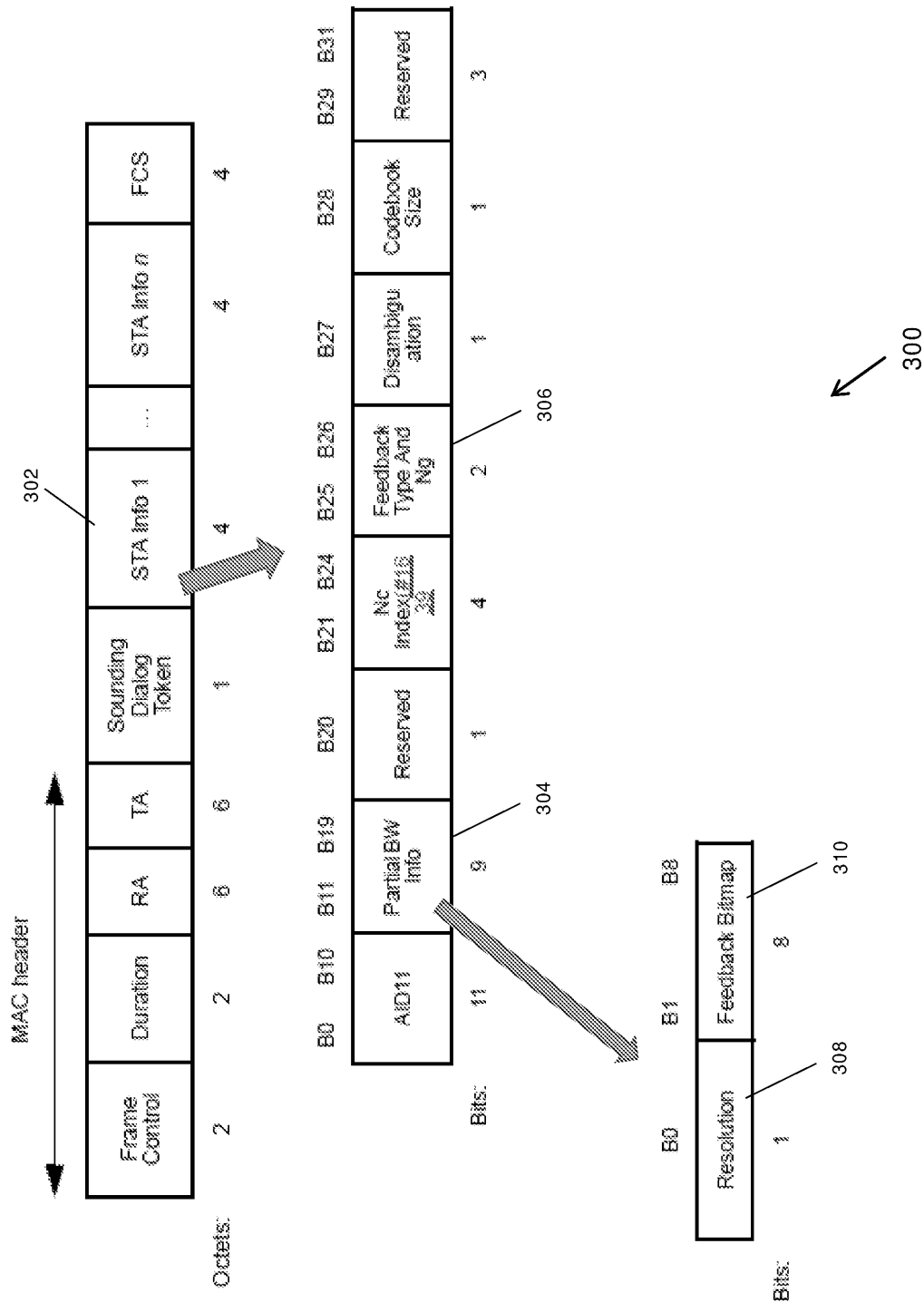


Figure 3

Feedback Type And Ng		Codebook Size	Description
B25	B26	B28	
0	0	0	SU, Ng = 4, quantization resolution $(\phi, \psi) = \{4, 2\}$
0	0	1	SU, Ng = 4, quantization resolution $(\phi, \psi) = \{6, 4\}$
0	1	0	SU, Ng = 16, quantization resolution $(\phi, \psi) = \{4, 2\}$
0	1	1	SU, Ng = 16, quantization resolution $(\phi, \psi) = \{6, 4\}$
1	0	0	MU, Ng = 4, quantization resolution $(\phi, \psi) = \{7, 5\}$
1	0	1	MU, Ng = 4, quantization resolution $(\phi, \psi) = \{9, 7\}$
1	1	0	CQI
1	1	1	MU, Ng = 16, quantization resolution $(\phi, \psi) = \{9, 7\}$

↗
400

Figure 4

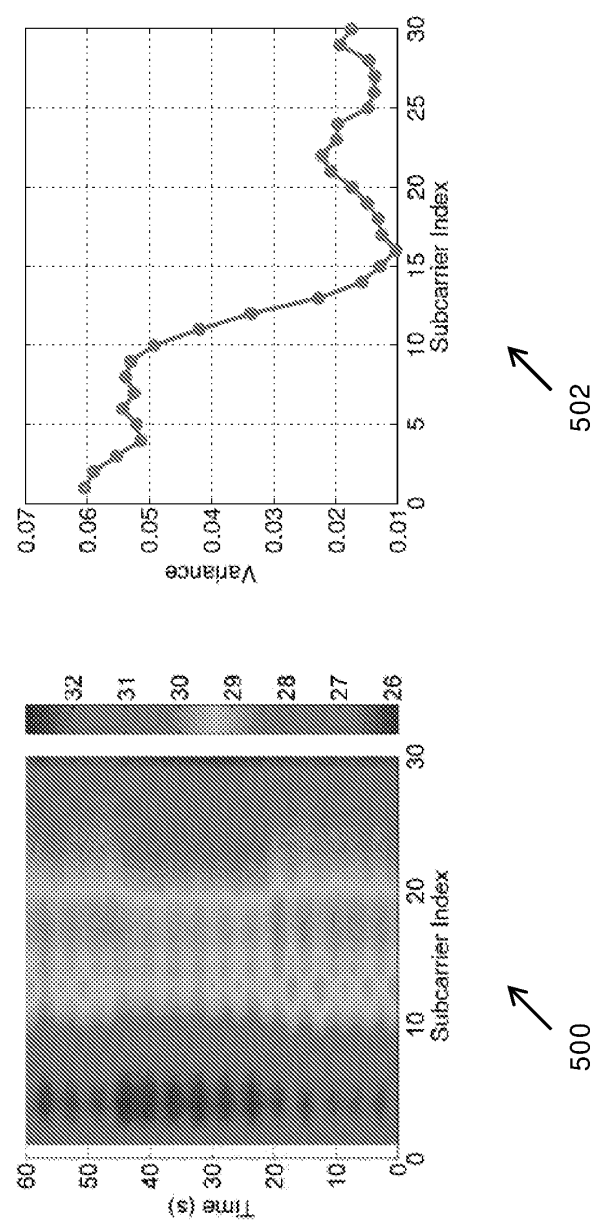


Figure 5

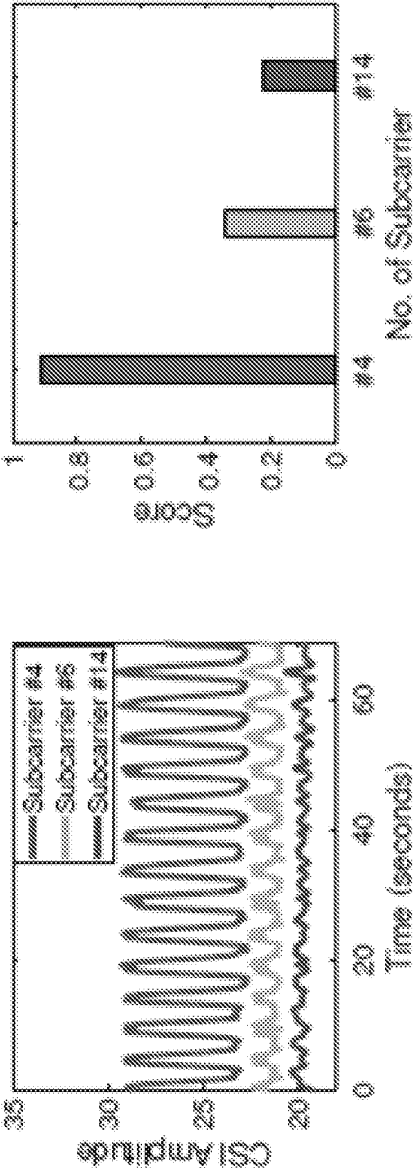


Figure 6A

Figure 6B

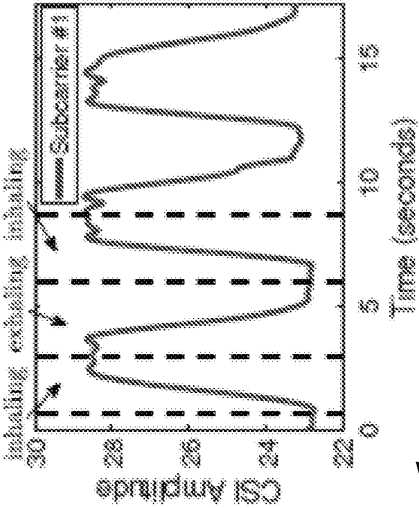


Figure 6C

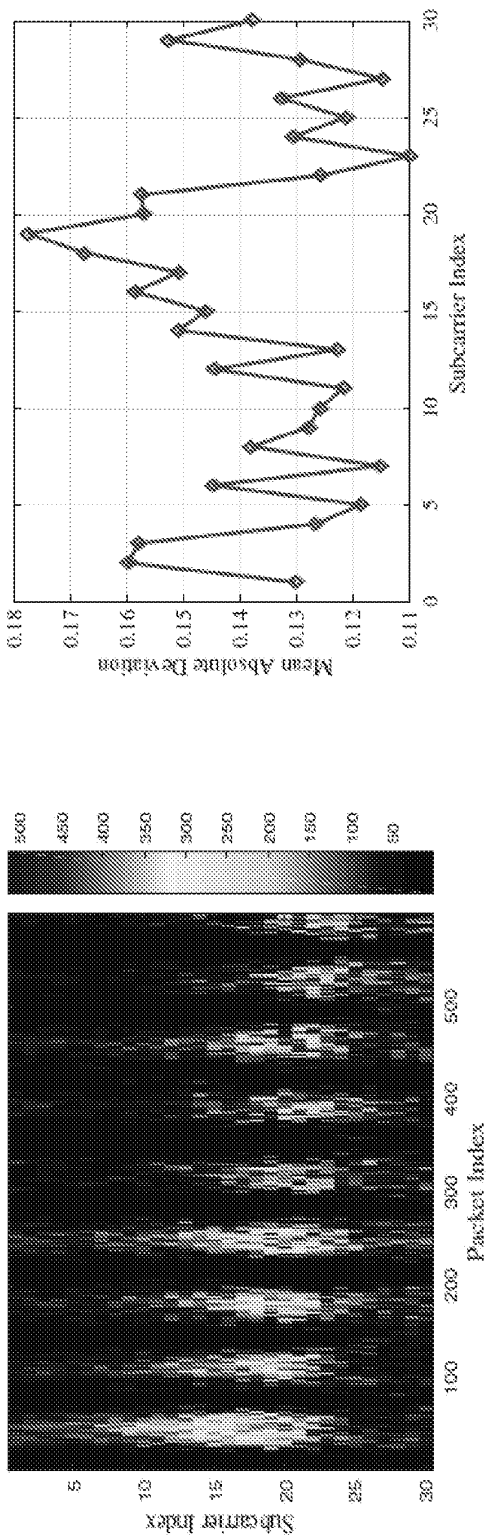


Figure 7A

Figure 7B

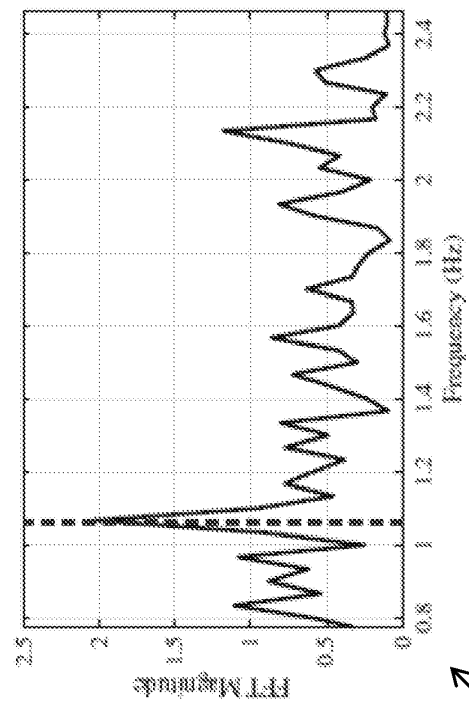


Figure 7C

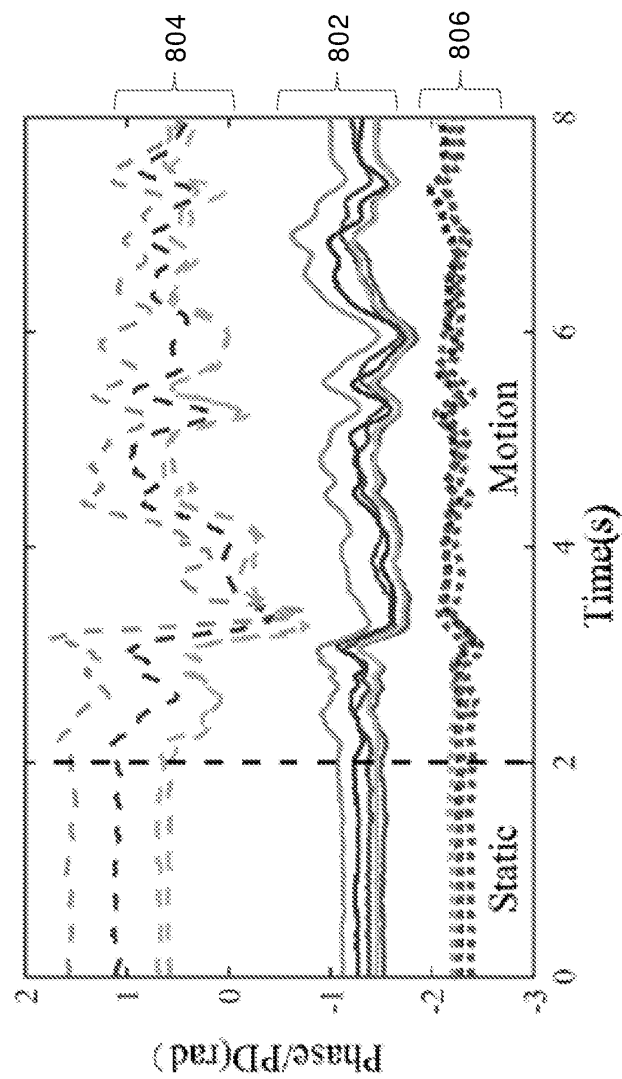


Figure 8

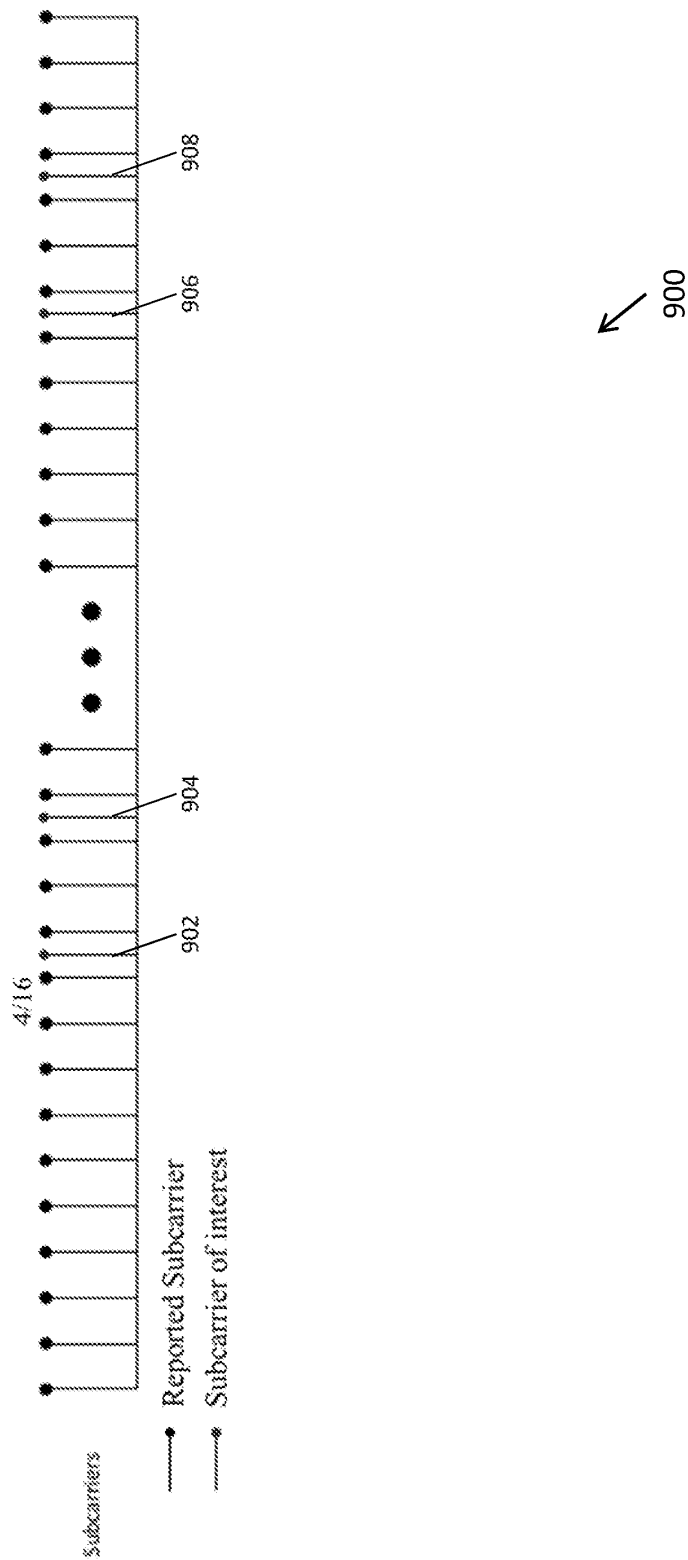
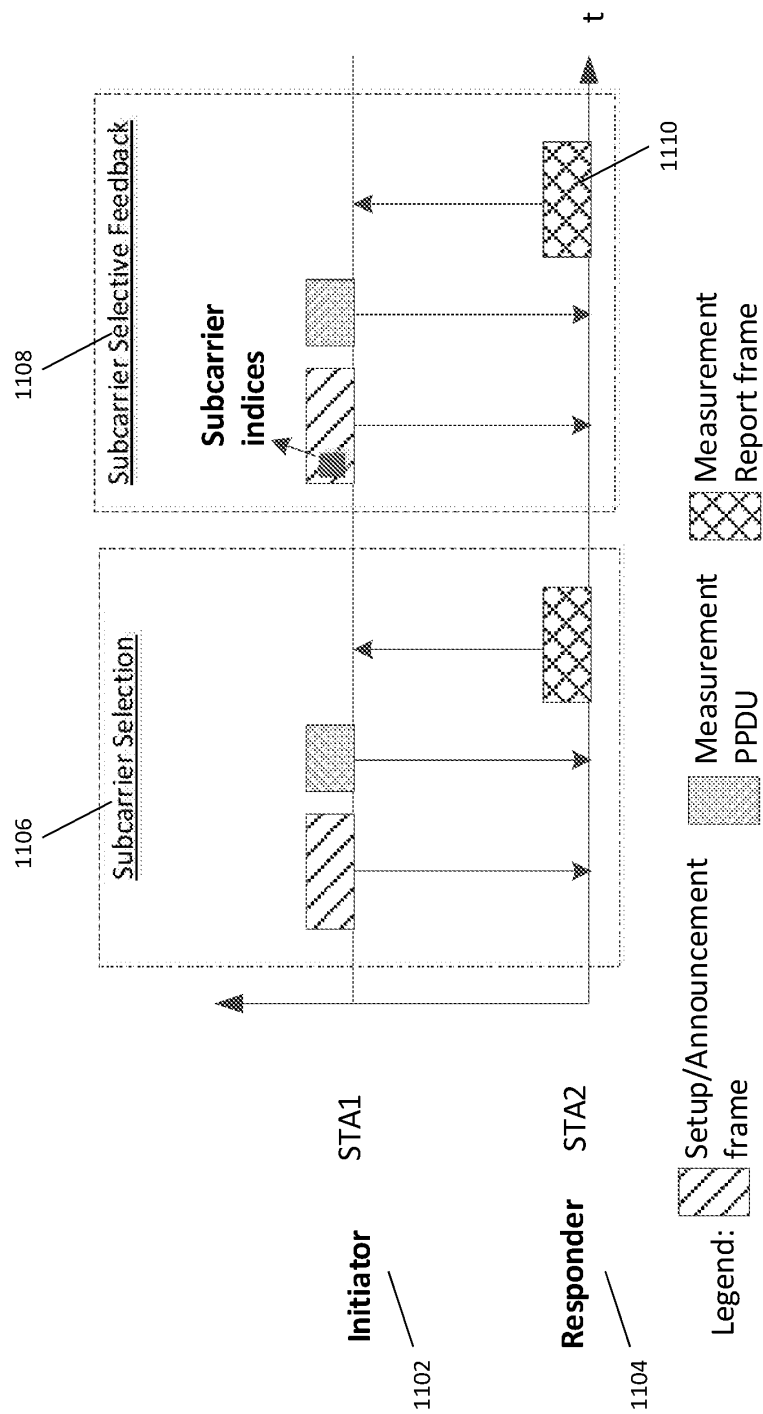


Figure 9

Table – Subcarrier indices for CSI/Amplitude/Phase matrices		
Channel Width	Ng	Superset of subcarrier indices (scidx)
320 MHz	1	-2036, -2035, -2034, -2033, -2032, -2031, ..., -1, 1, ..., 2031, 2032, 2033, 2034, 2035, 2036
	2	-2036, -2034, -2032, -2030, -2028, -2026, ..., -2, 2, ..., 2026, 2028, 2030, 2032, 2034, 2036
	4	-2036, -2032, -2028, -2024, -2020, -2016, ..., -4, 4, ..., 2016, 2020, 2024, 2028, 2032, 2036
	8	-2036, -2028, -2020, -2012, -2004, -1996, ..., -8, 8, ..., 1996, 2004, 2012, 2020, 2028, 2036
	16	-2036, -2020, -2004, -1988, -1972, -1956, ..., -12, 12, ..., 1956, 1972, 1988, 2004, 2020, 2036
	32	-2036, -2004, -1972, -1940, -1908, -1876, ..., -32, 32, ..., 1876, 1908, 1940, 1972, 2004, 2036
	64	-2036, -1972, -1908, -1844, -1780, -1716, ..., -64, 64, ..., 1716, 1780, 1844, 1908, 1972, 2036
	128	-2036, -1908, -1780, -1652, -1524, -1396, ..., -128, 128, ..., 1396, 1524, 1652, 1780, 1908, 2036

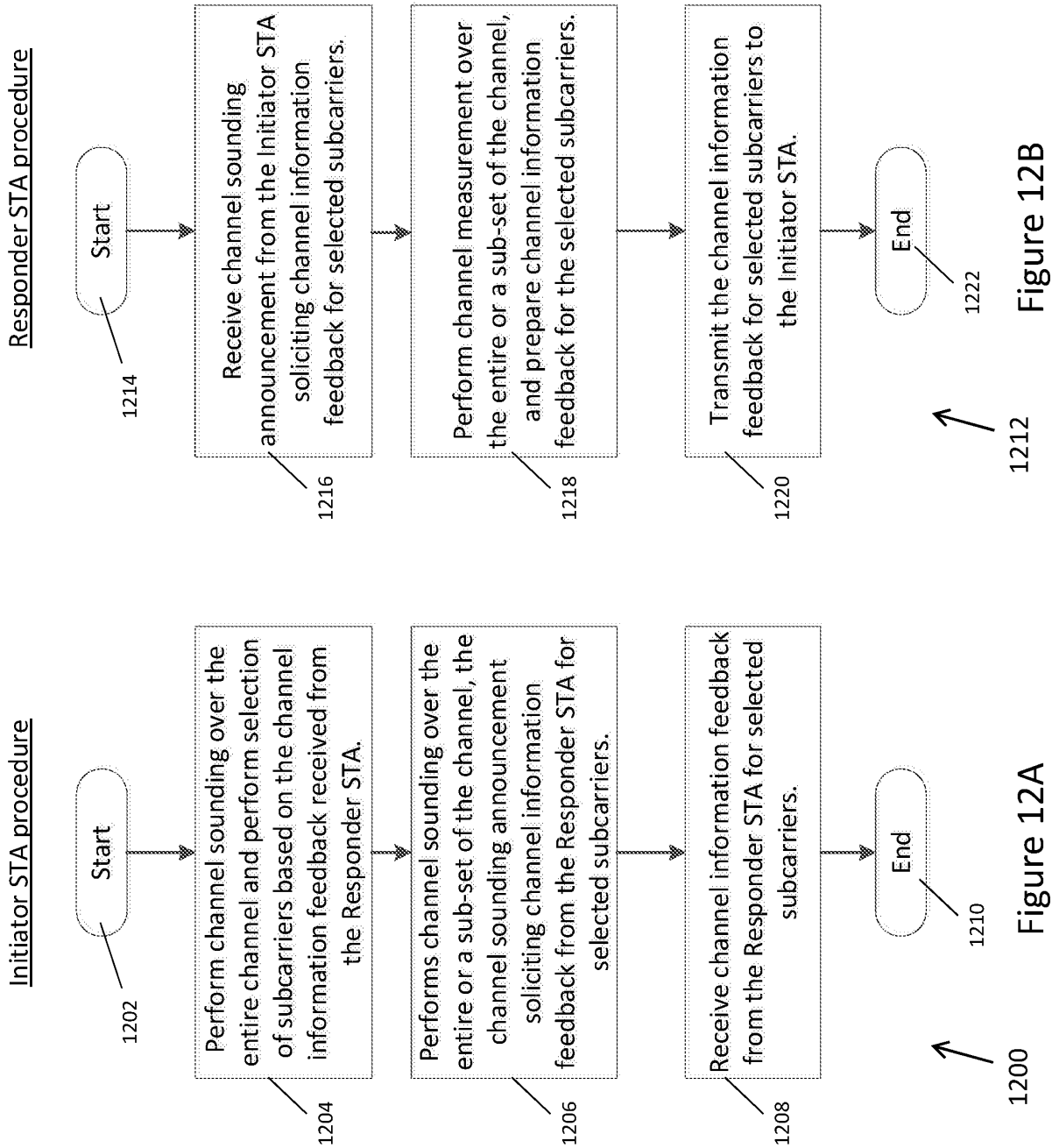
↗
1000

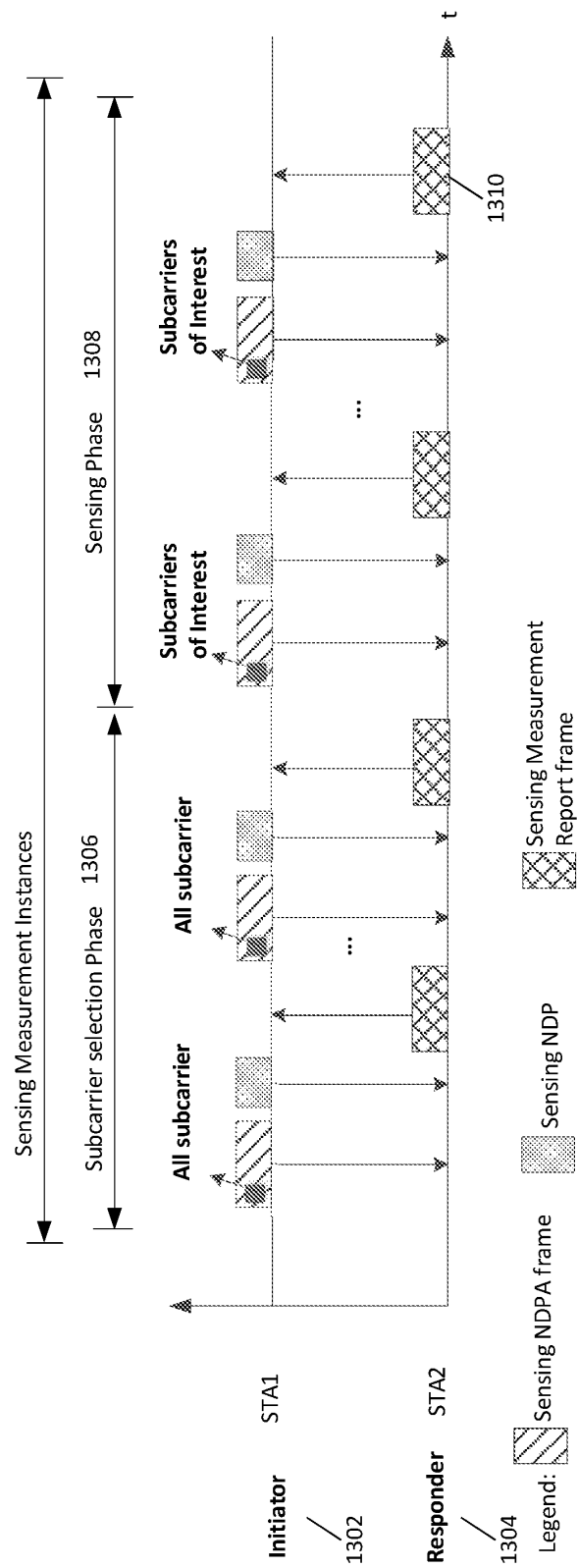
Figure 10



1100

Figure 11





1300

Figure 13

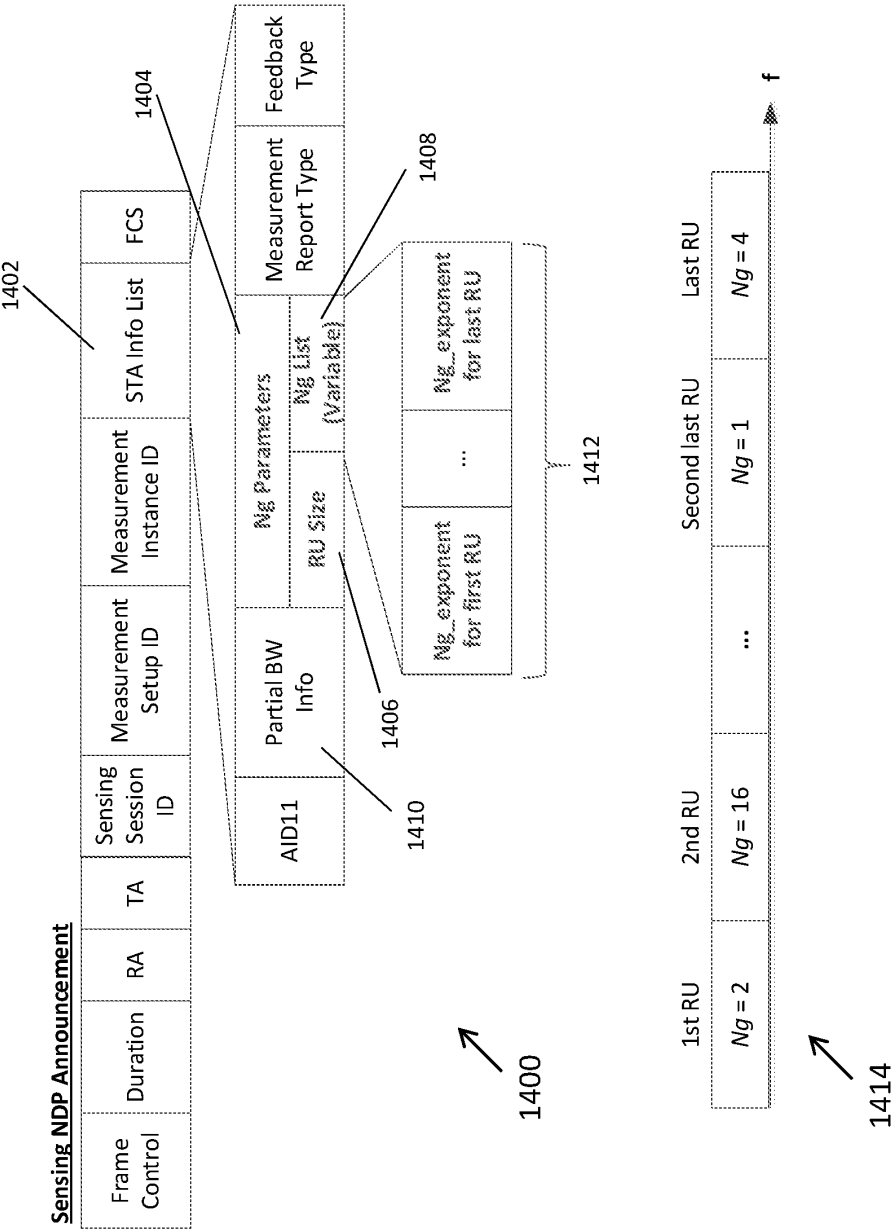


Figure 14

Ng_exponent	Ng_value
0	1
1	2
2	4
3	8
4	16
5	32
6	64
7	128

↗
1502

Figure 15B

RU Size field	RU Size
0	26
1	52
2	106
3	242
4	484
5	996
6	2*996
7	4*996

↗
1500

Figure 15A

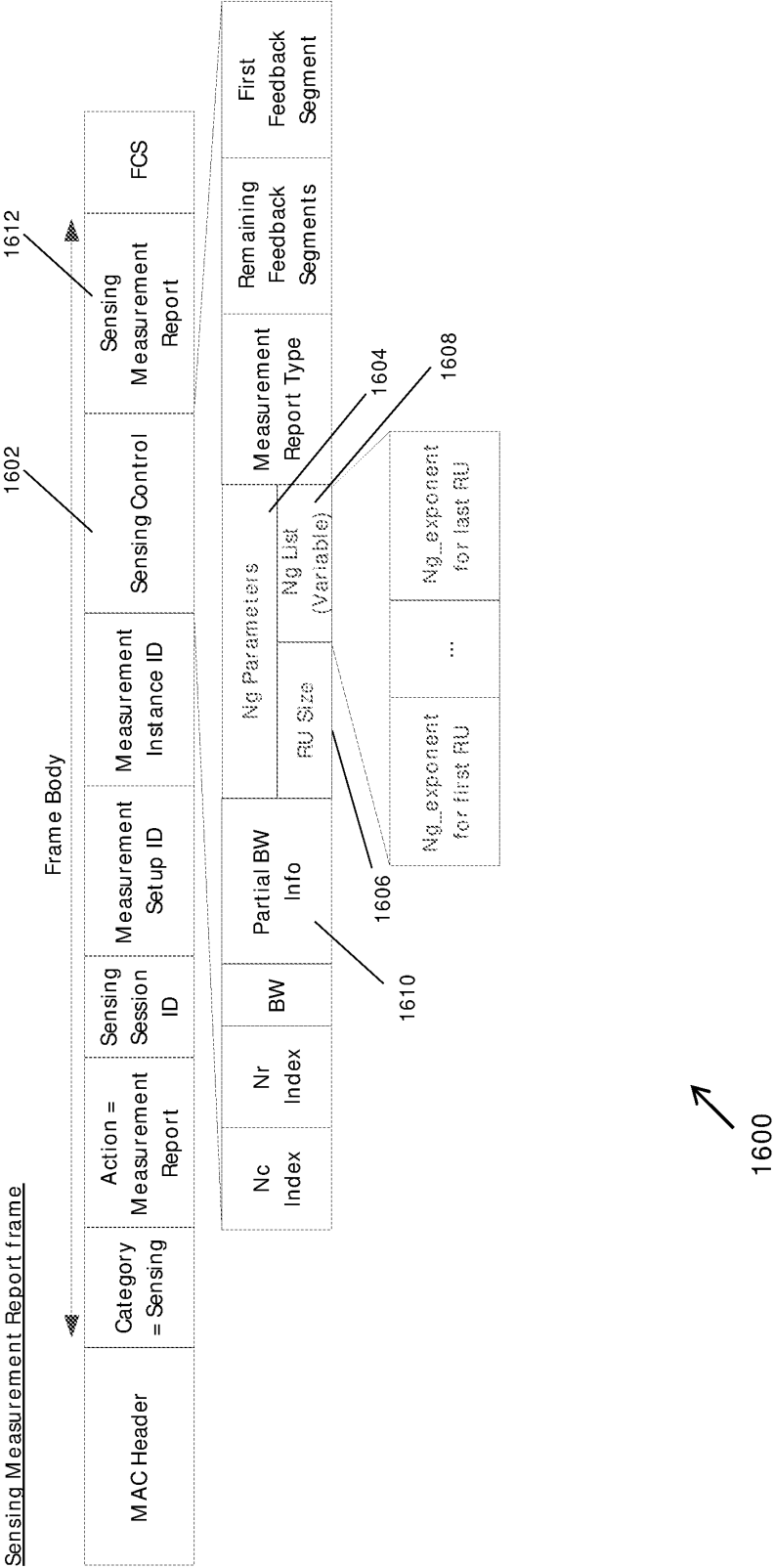


Figure 16

Sensing Measurement Report field (CSI)		
Field	Size (bits)	Meaning
SNR/RSSI in receive chain 1	8	Signal-to-noise ratio (SNR) or receive signal strength indicator (RSSI) in the first receive chain of the STA sending the report.
...		
SNR/RSSI in receive chain N_r	8	Signal-to-noise ratio (SNR) or receive signal strength indicator (RSSI) in the N_r th receive chain of the STA sending the report.
CSI matrix for subcarrier $k = \text{scidx_1st_Segment}(0)$	$3 + 2 \times N_b \times N_c \times N_r$	CSI matrix for the 1 st subcarrier in the 1 st segment
...		
CSI matrix for subcarrier $k = \text{scidx_1st_Segment}(N_s - 1)$	$3 + 2 \times N_b \times N_c \times N_r$	CSI matrix for the last subcarrier in the 1 st segment
...		
CSI matrix for subcarrier $k = \text{scidx_nth_Segment}(0)$	$3 + 2 \times N_b \times N_c \times N_r$	CSI matrix for the 1 st subcarrier in the n^{th} segment
...		
CSI matrix for subcarrier $k = \text{scidx_nth_Segment}(N_s - 1)$	$3 + 2 \times N_b \times N_c \times N_r$	CSI matrix for the last subcarrier in the n^{th} segment

Figure 17

Table – scidx_mth_segment(k) when the segment sizes are 242 tones or 484 tones						
242-tone RU index	20 MHz	40 MHz	80 MHz	160 MHz	320 MHz	
1	Ng = 1	[−122:1:−2, −1, 1, 2:1:122]	[−244:1:−1]	[−500:1: −259]	[−1012:1: −771]	[−2036:1: −1795]
	Ng = 2	[−122:2:−2, 2:2:122]	[−244:2:−2]	[−500:2: −260]	[−1012:2: −772]	[−2036:2: −1796]
	Ng = 4	[−122, −120:4:−4, −2, 2, 4:4:120, 122]	[−244:Ng:−4]	[−500:Ng: −260]	[−1012:Ng: −772]	[−2036:Ng: −1796]
	...					
	Ng = 16	[−122, −116:16:−4, −2, 2, 4:16:116, 122]				
	...					
2	Ng = 1	-	[1:1:244]	[−253:1: −12]	[−765:1: −524]	[−1789:1: −1548]
...	...	-				
...						
16	Ng = 1	-	-	-	-	[1796:1: 2036]
	...	-	-	-	-	

1800

Figure 18

Table – scidx_mth_segment(k) when the segment sizes are 996 tones or 2*996 tones				
996-tone RU index	80 MHz	160 MHz	320 MHz	
1	Ng = 1	[-500:1;-3, 3:1:500]	[-1012:1;-515,-509:1;-12]	[-2036:1;-1539, -1533:1;-1036]
	Ng = 2	[-500:2;-4, 4:2:500]	[-1012:2;-516,-508:2;-12]	[-2036:2;-1540, -1532:2;-1036]
	Ng = 4	[-500:4;-4, 4:4:500]	[-1012:4;-516,-508:4;-12]	[-2036:4;-1540, -1532:4;-1036]
	...			
	Ng = 16	[-500:16;-260,-252:16;-12,-4, 4:12:16:252, 260:16:500]	[-1012:16;-772,-764:16;-524,-516,-508,-500:16;-260,-252:16;-12]	[-2036:16;-1796,-1788:16;-1548,-1540,-1532,-1524:16;-1284,-1276:16;-1036]
2	...			
	Ng = 1	-	[12:1:509,515:1:1012]	[-1012:1;-515,-509:1;-12]
	...	-		
3	Ng = 1	-	-	[12:1:509,515:1:1012]
	...	-	-	
	Ng = 1	-	-	[1036:1:1532,1540:1:2036]
4	...	-	-	

1900

Figure 19

Sensing NDP Announcement
(BW = 160 MHz)

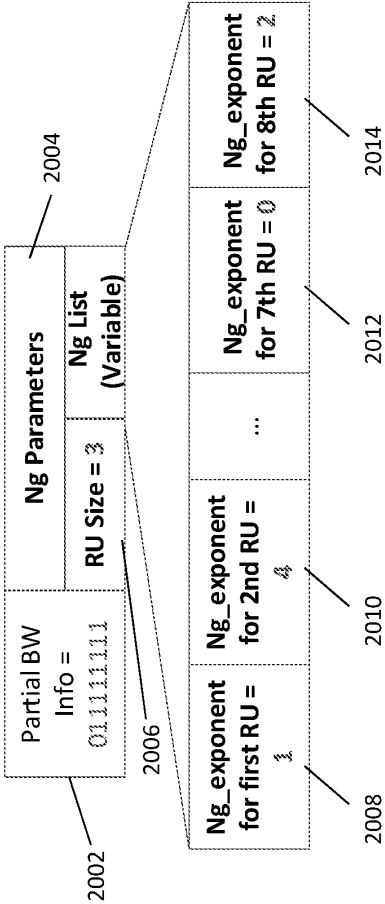


Figure 20A

2000

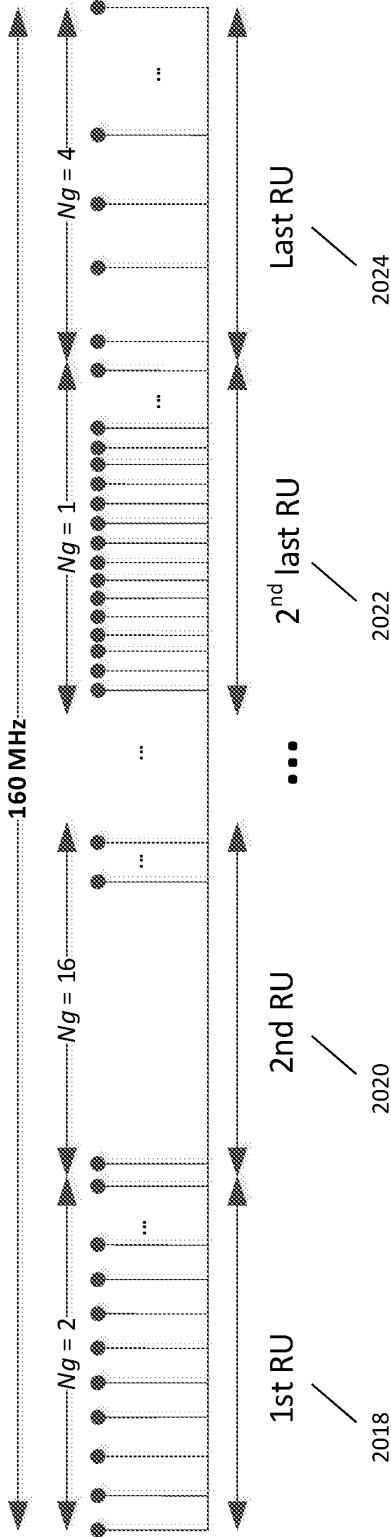


Figure 20B

2016

Sensing NDP Announcement
(BW = 320 MHz)

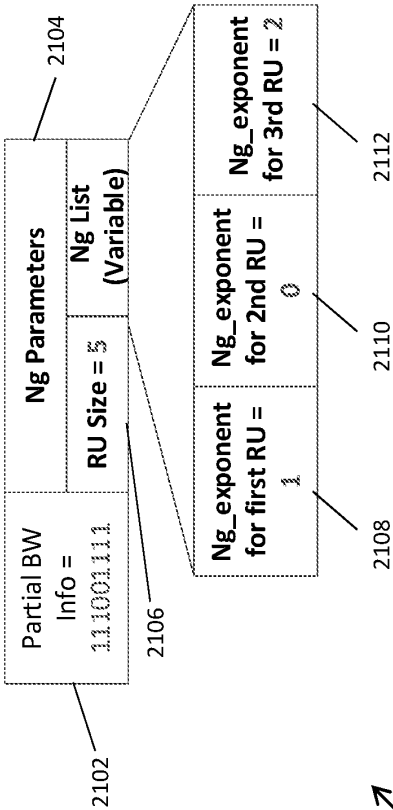


Figure 21A

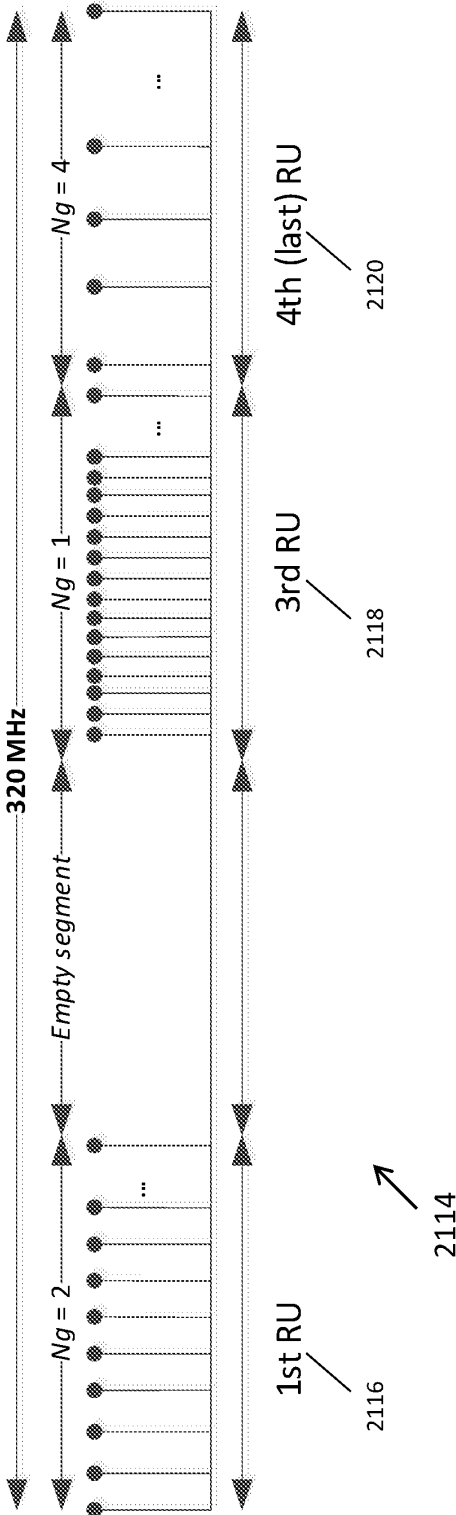


Figure 21B

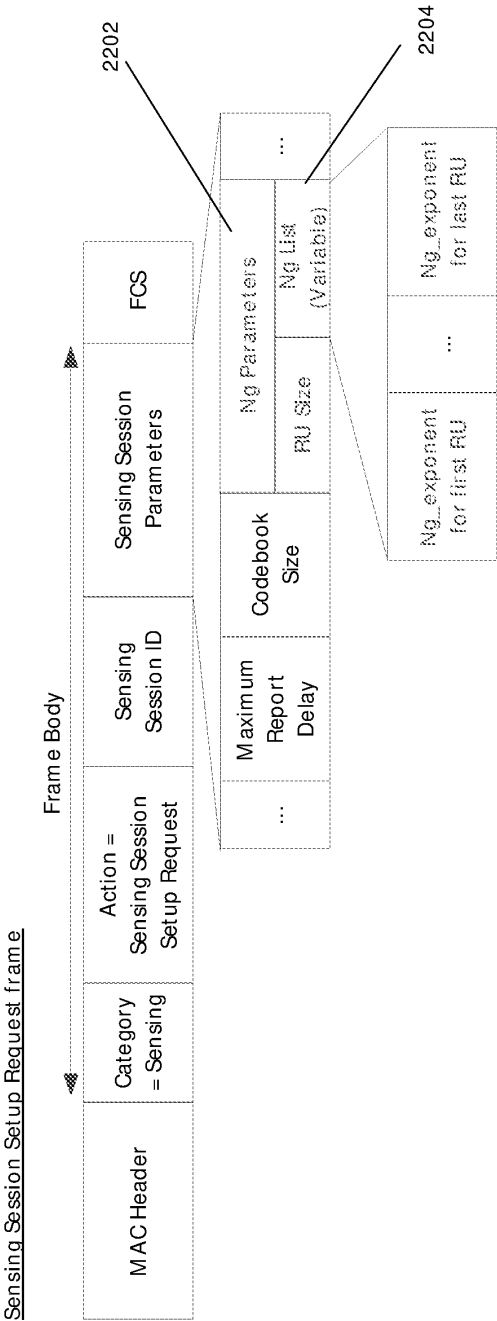


Figure 22

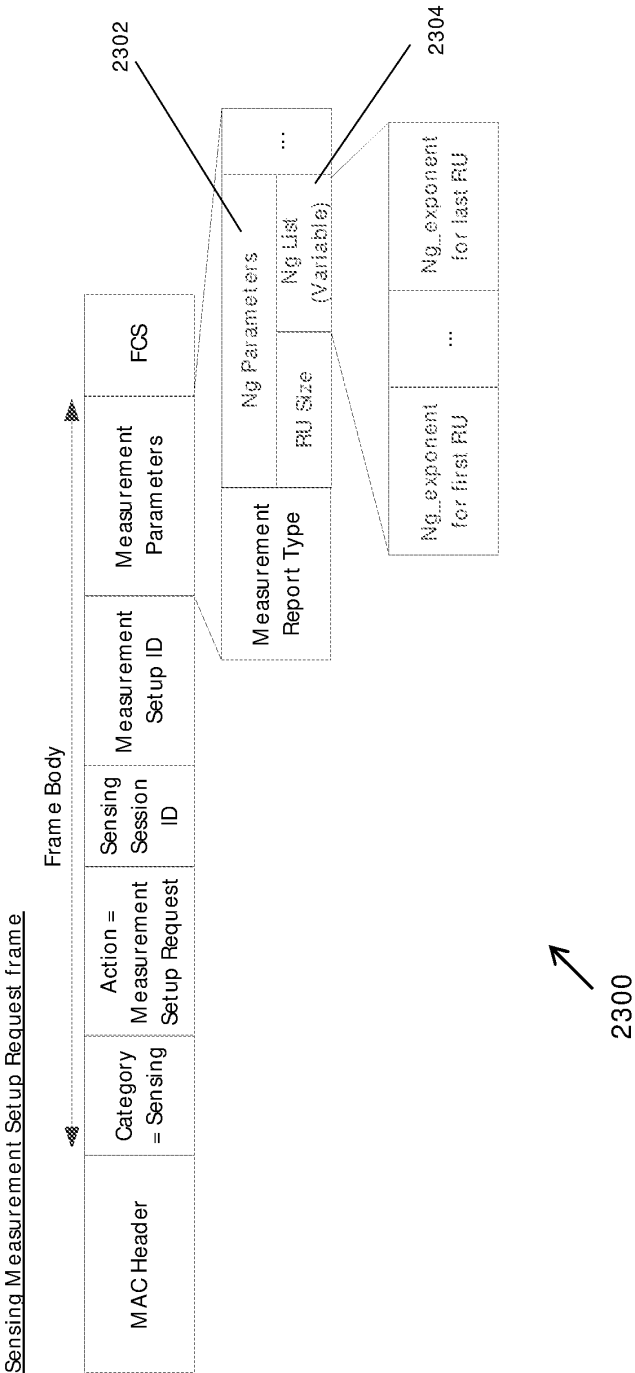


Figure 23

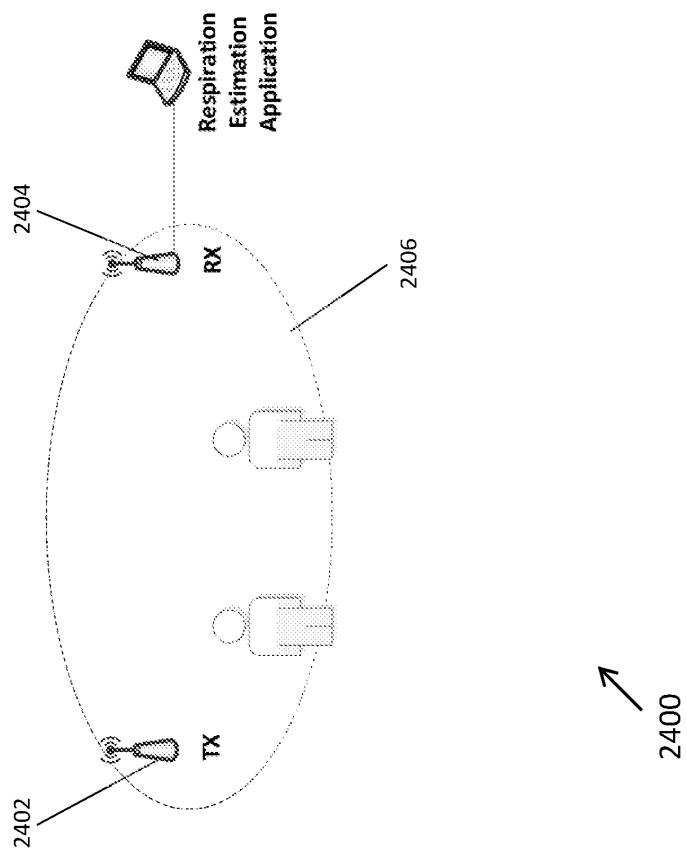
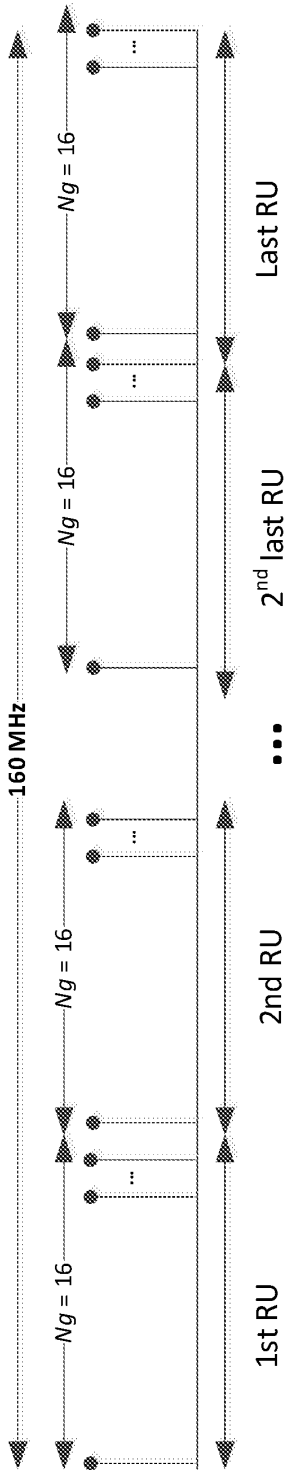


Figure 24



2500

Figure 25

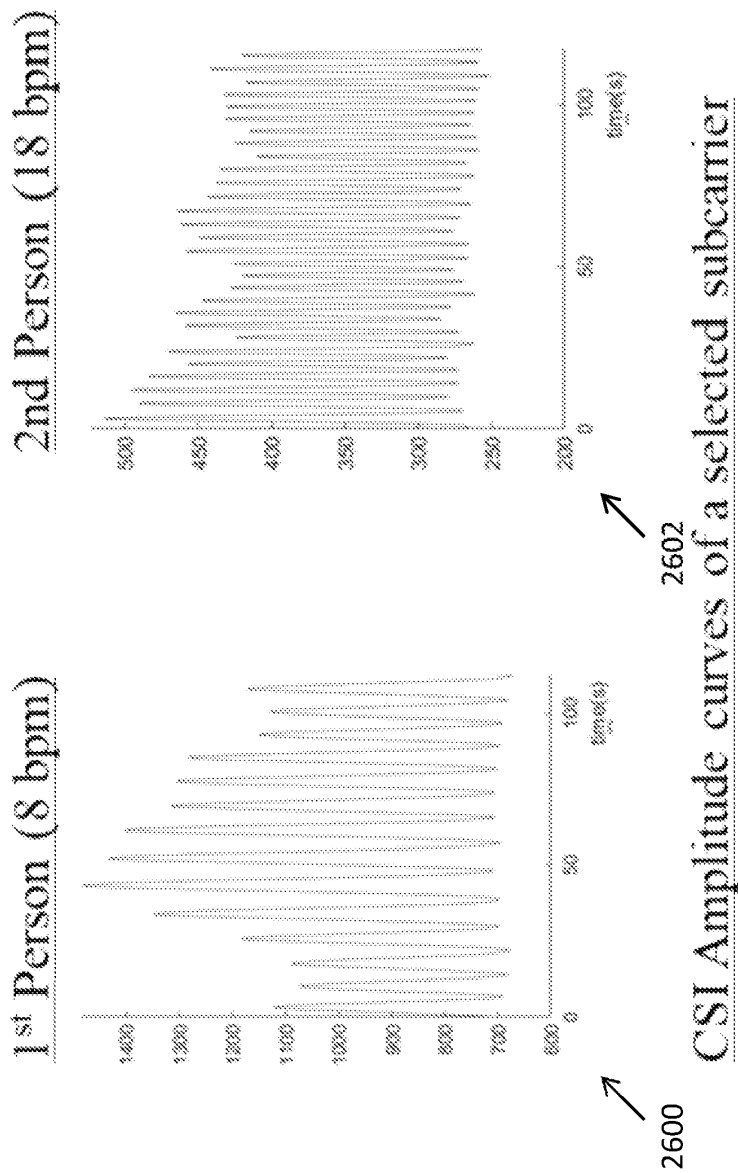


Figure 26

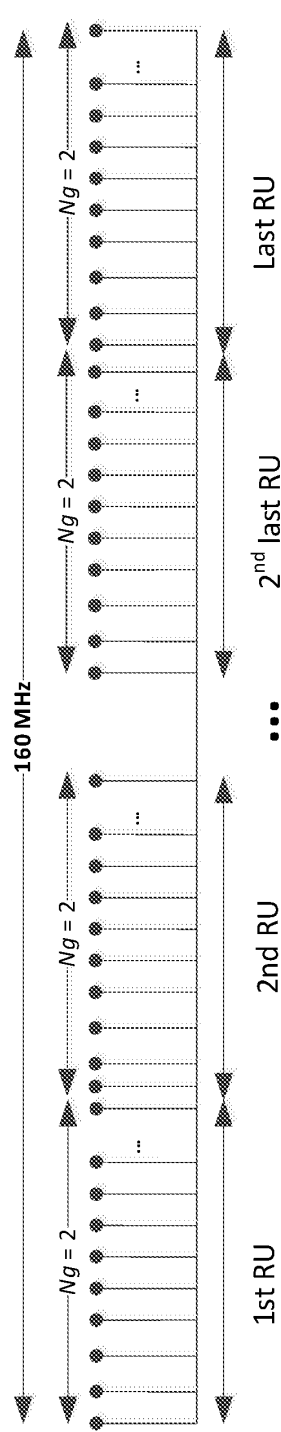


Figure 27A
2700

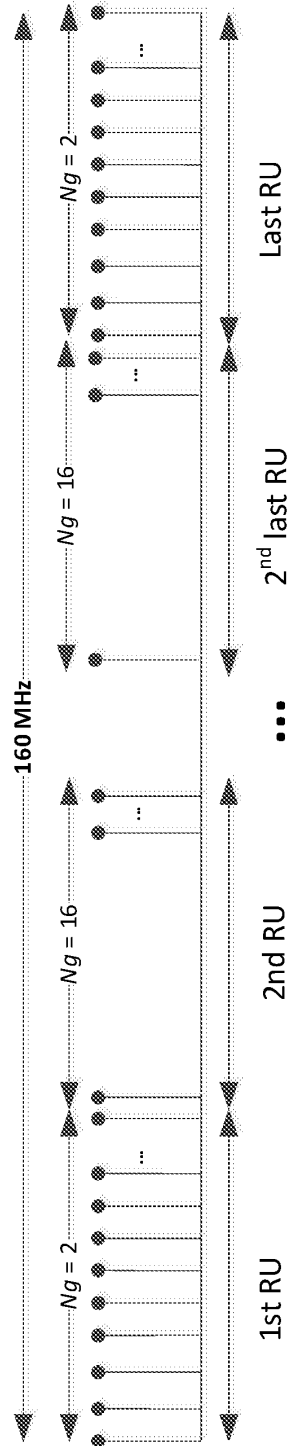


Figure 27B
2702

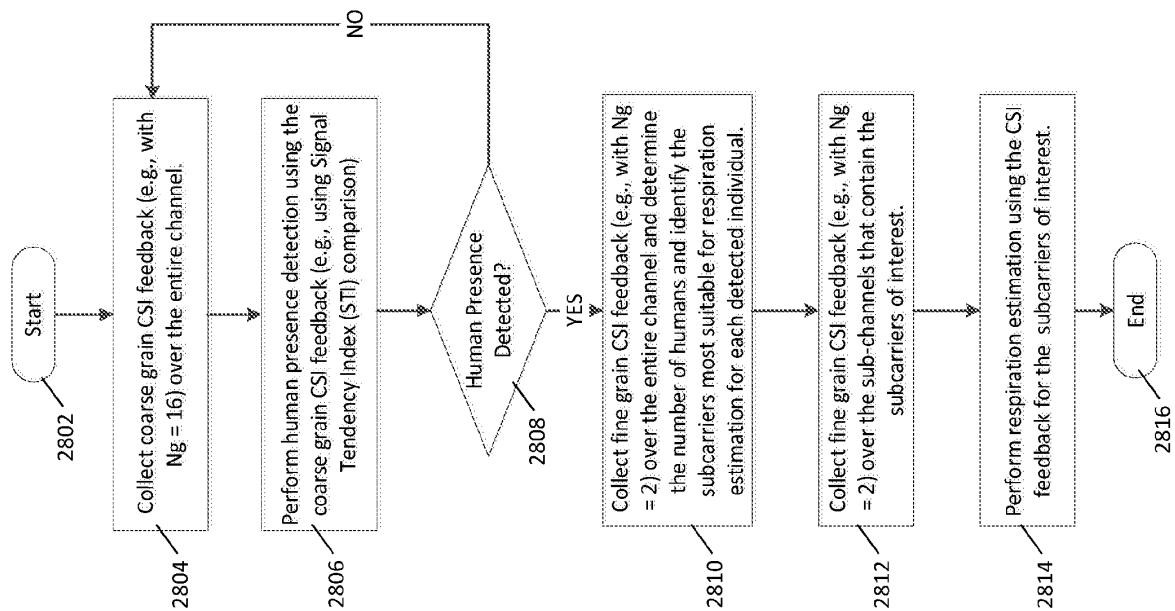


Figure 28

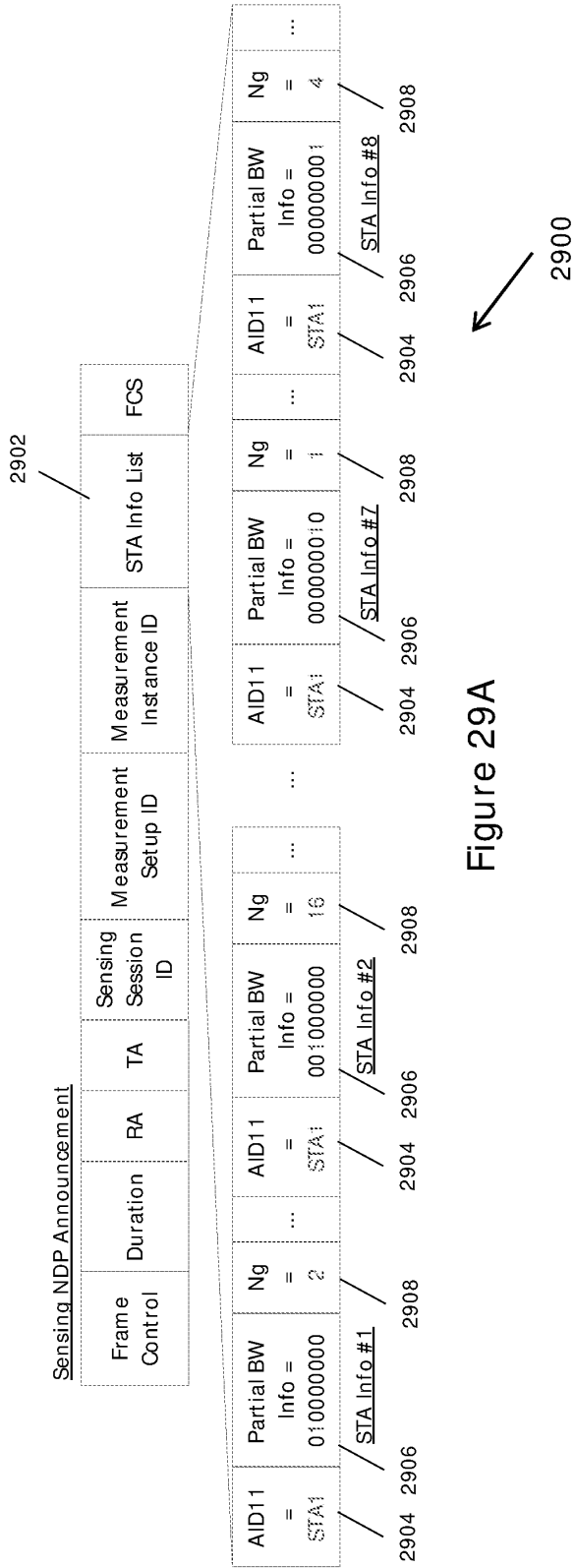


Figure 29A

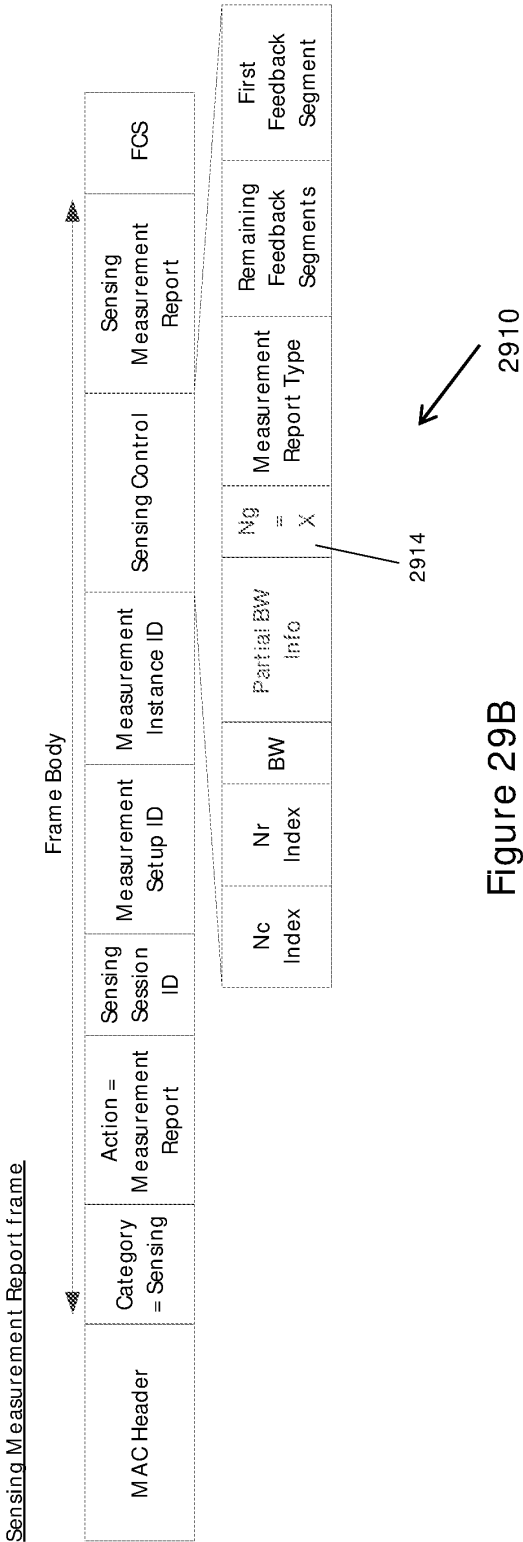


Figure 29B

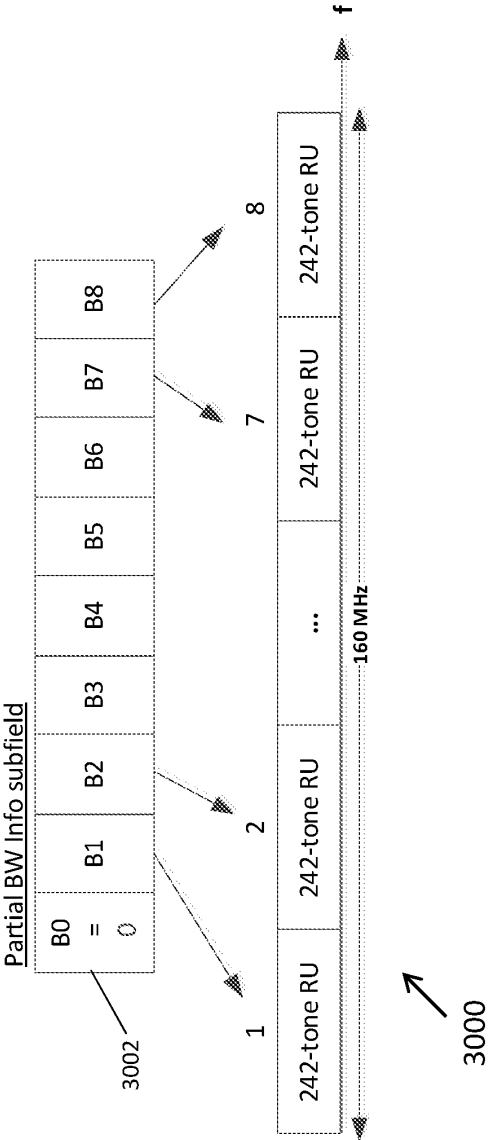


Figure 30A

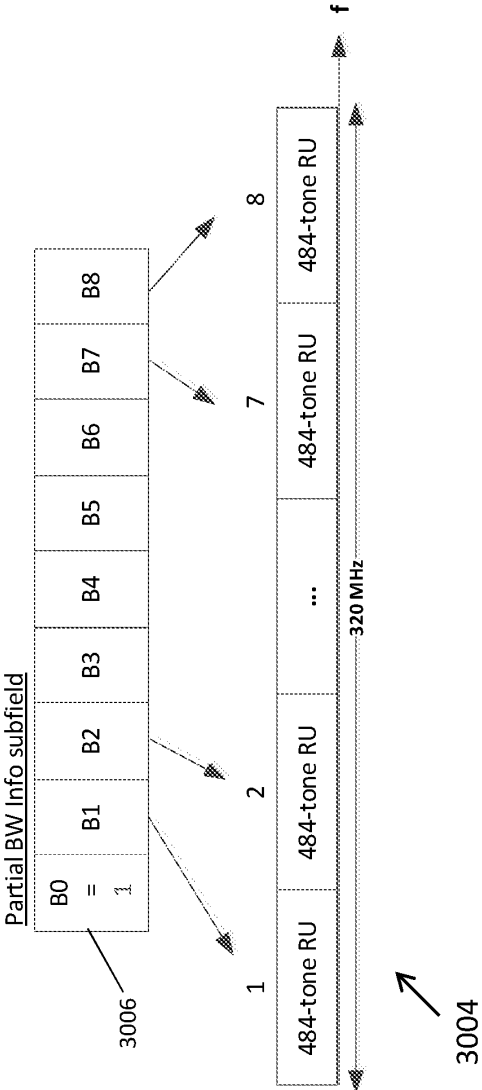


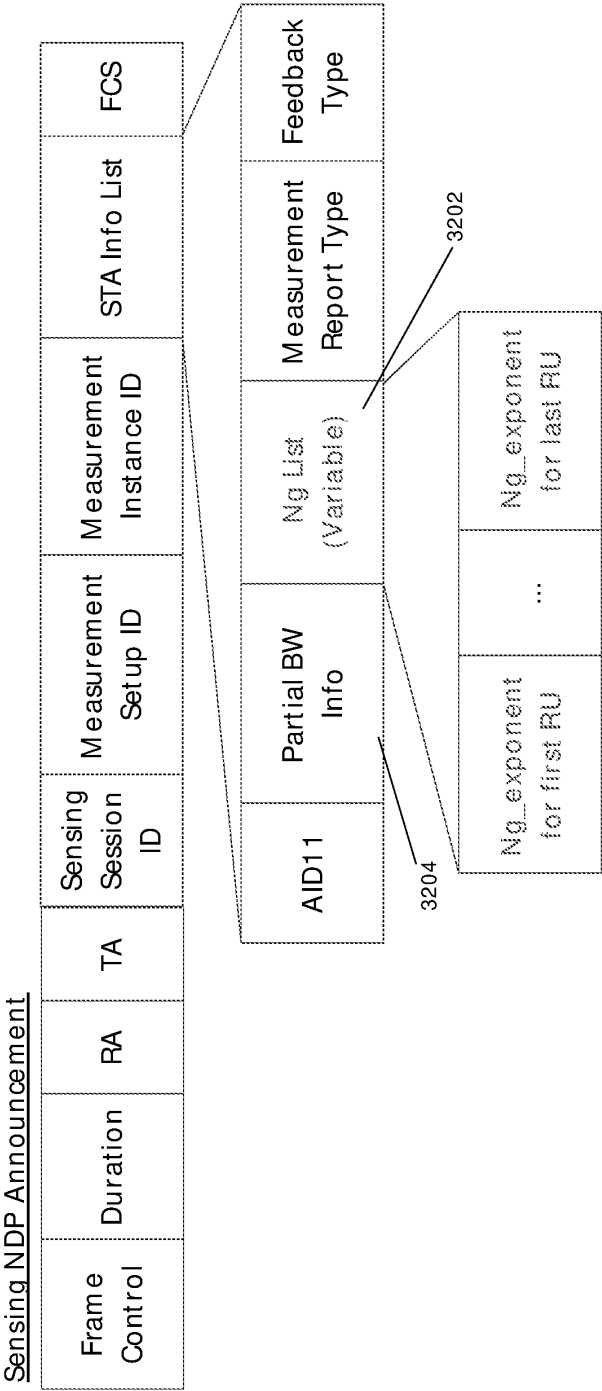
Figure 30B

Table – Example of additional settings for BW, Partial BW Info subfield in the Sensing NDP Announcement frame in addition to the settings already allowed in EHT NDP Announcement frame			
Feedback size	Bandwidth of the Sensing NDP Announcement frame (MHz)	Partial BW Info subfield values in binary format (B0 B1 B2 B3 B4 B5 B6 B7 B8)	Operating channel width of the Sensing Responder (MHz)
2 x 242-tones	80	01010000, 010010000, 001100000, 001010000	80, 160, 320
	160	010001000, 0100000100, 0100000010, 0100000001, 001001000, ... , 0000000101, 0000000110	160, 320
	320	Same as 484 feedback RU size in EHT NDP Announcement frame	320
3 x 242-tones	80	Same as 484+242 feedback RU size in EHT NDP Announcement frame	80, 160, 320
	160	011001000, 0110000100, 0110000010, 0110000001, 001101000, ... , 0000100011	160, 320
4 x 242-tones	160	011001100, 0110000011, 000111100, 000110011, 010001110, 01001101, 010000111, 001001110, ... , 000010111	160, 320
	320 (2 x 484-tones)	110001000, 1100000100, 1100000010, 1100000001, 101001000, ... , 1000000101, 1000000110	320
...			
6 x 242-tones	160	011111010, 011111001, 011110110, 011110101, 011101110, ..., 001011111	160, 320
	320 (3 x 484-tones)	111001000, 1110000100, 1110000010, 1110000001, 101101000, ... , 1000100011	320
...			
6 x 484-tones	320	111110001, 11111010, 111110101	320

Figure 31



3100



↗
3200

Figure 32

Sensing NDP Announcement /
Sensing Measurement Report field

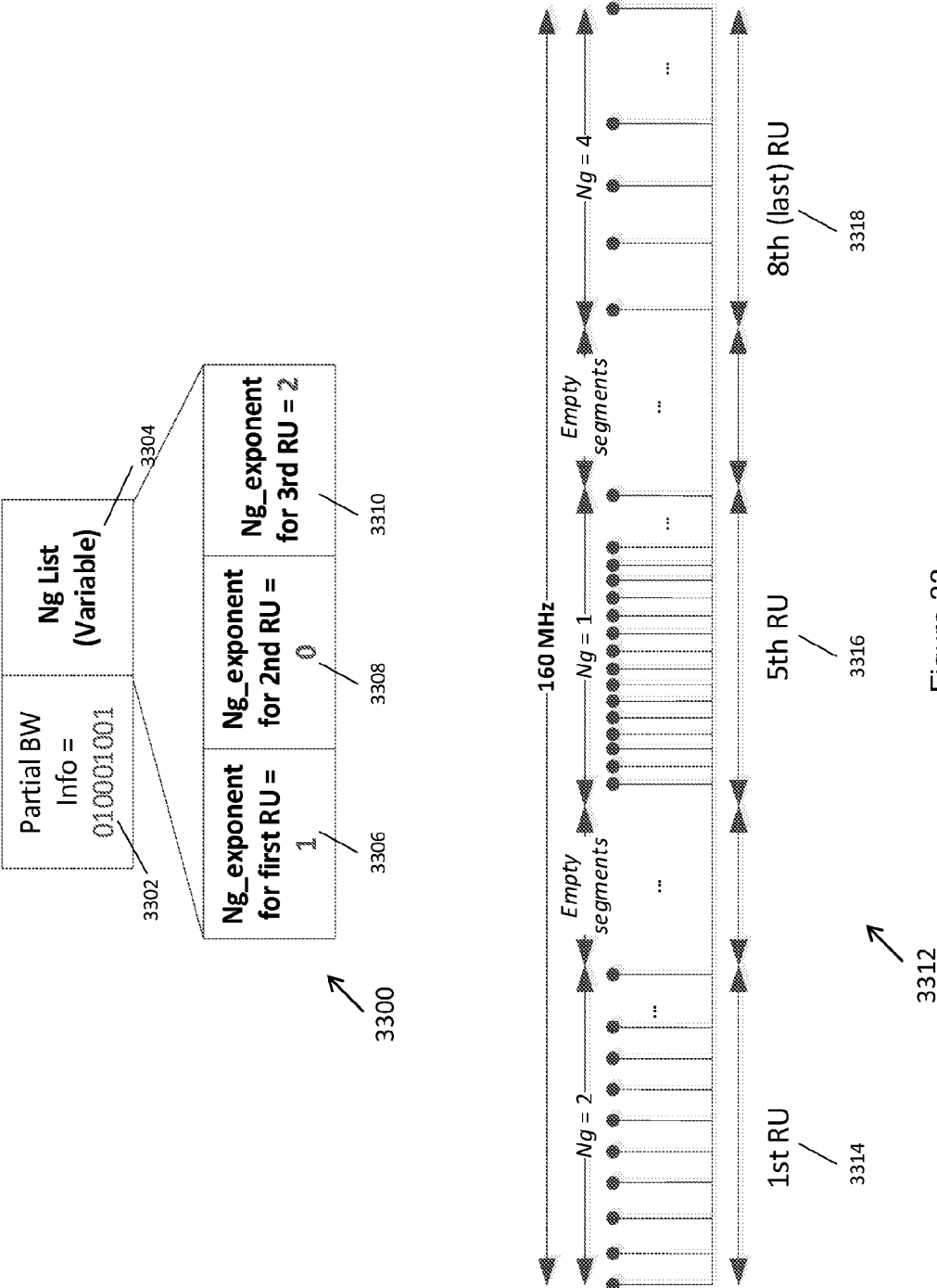


Figure 33

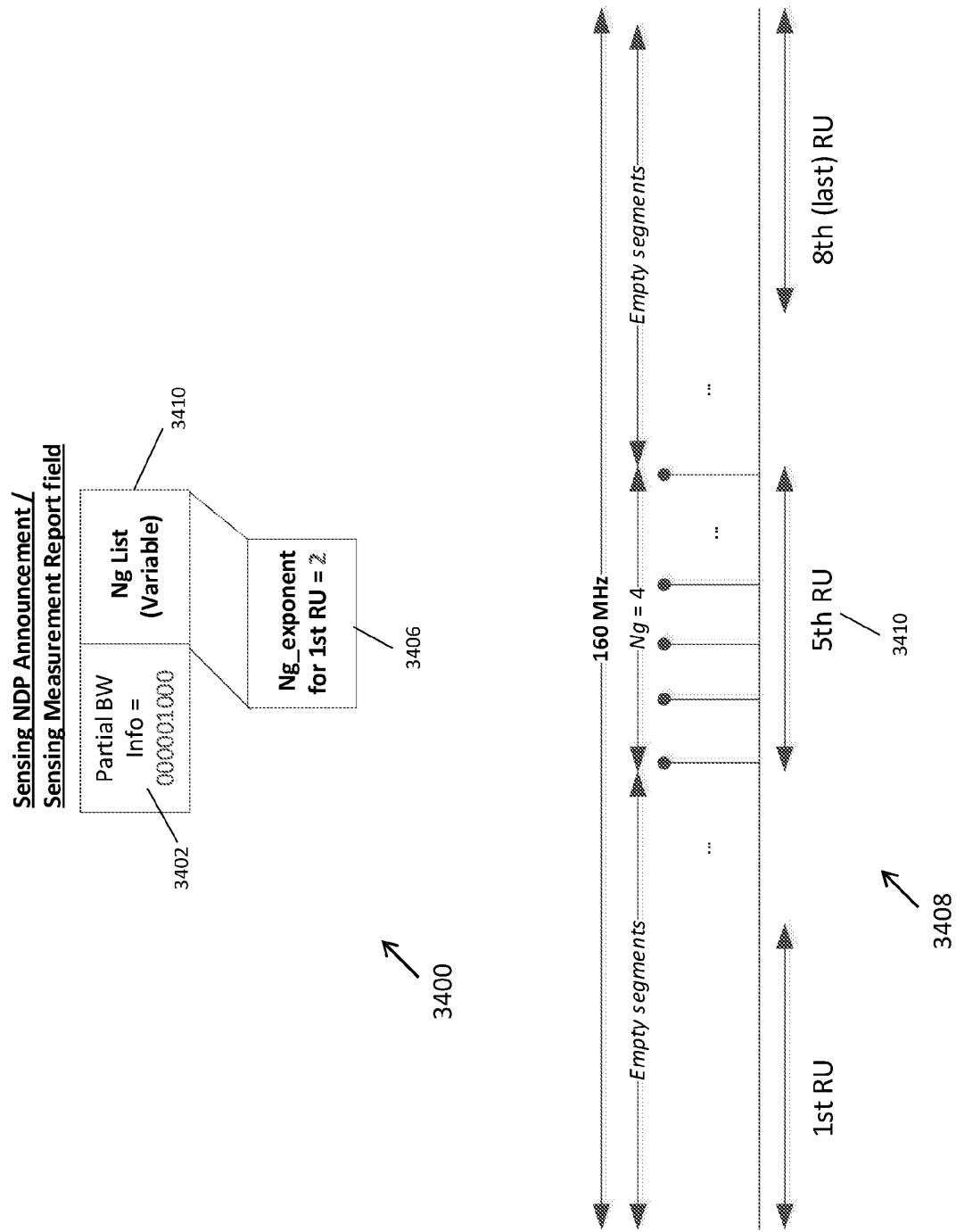


Figure 34

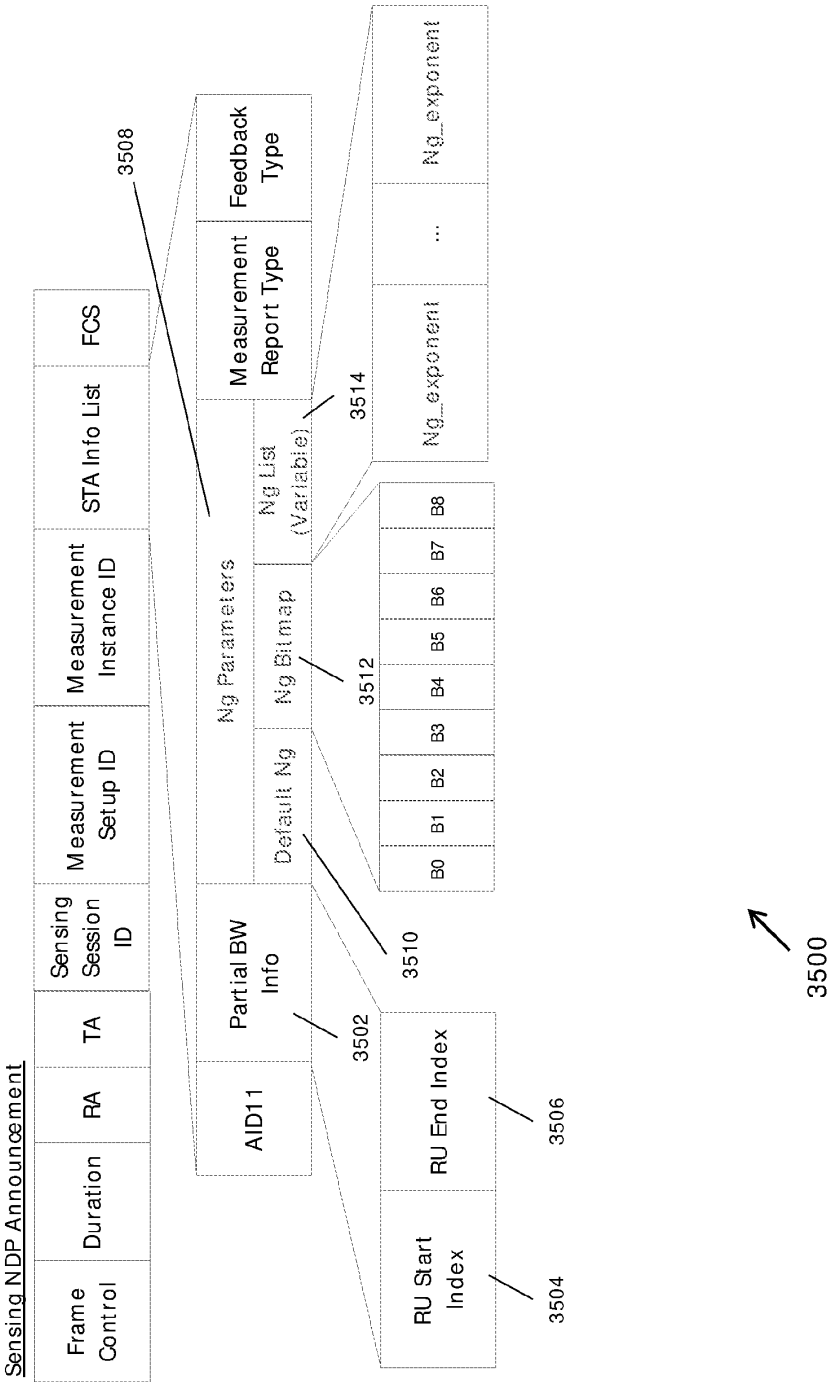


Figure 35

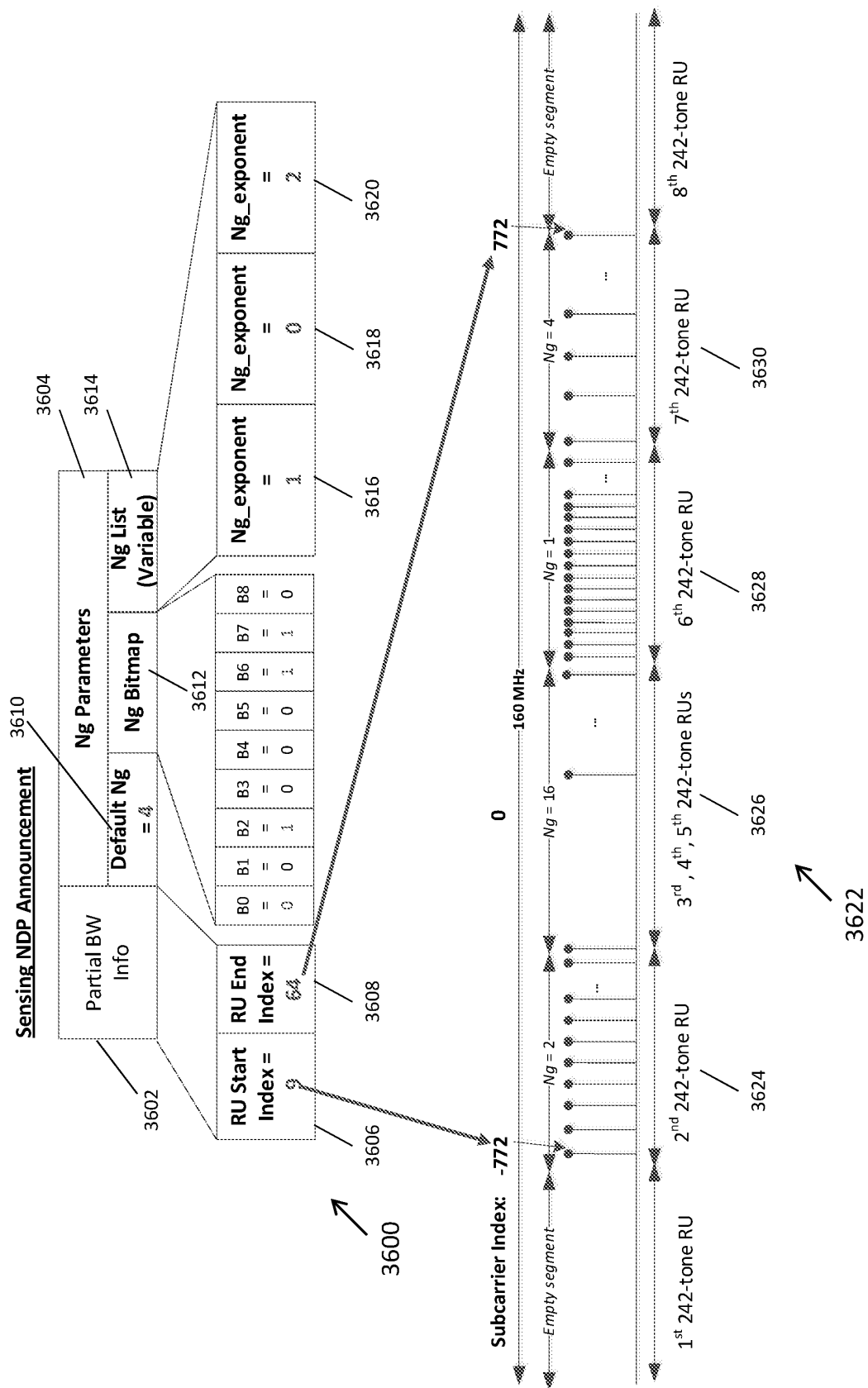


Figure 36

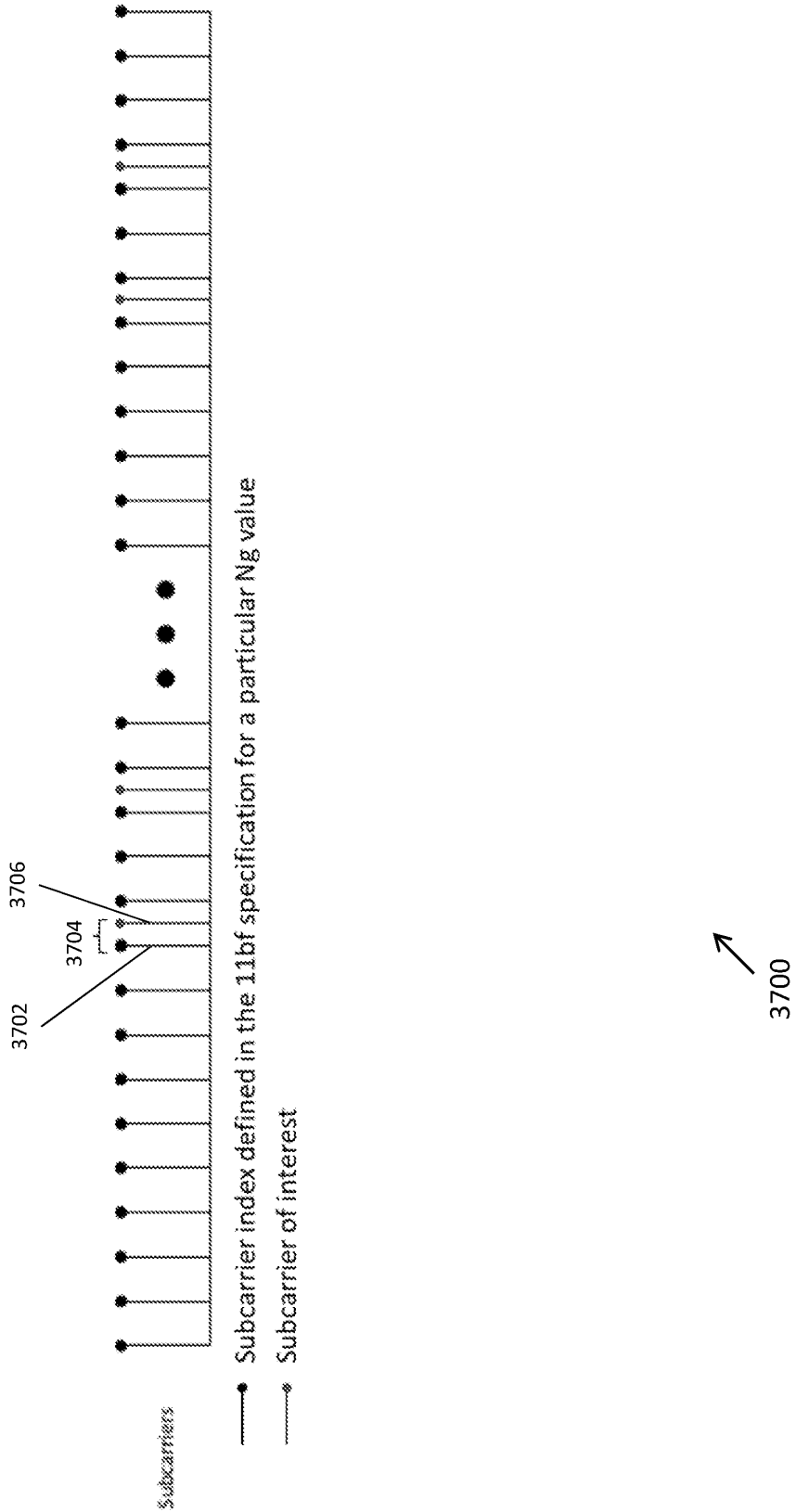
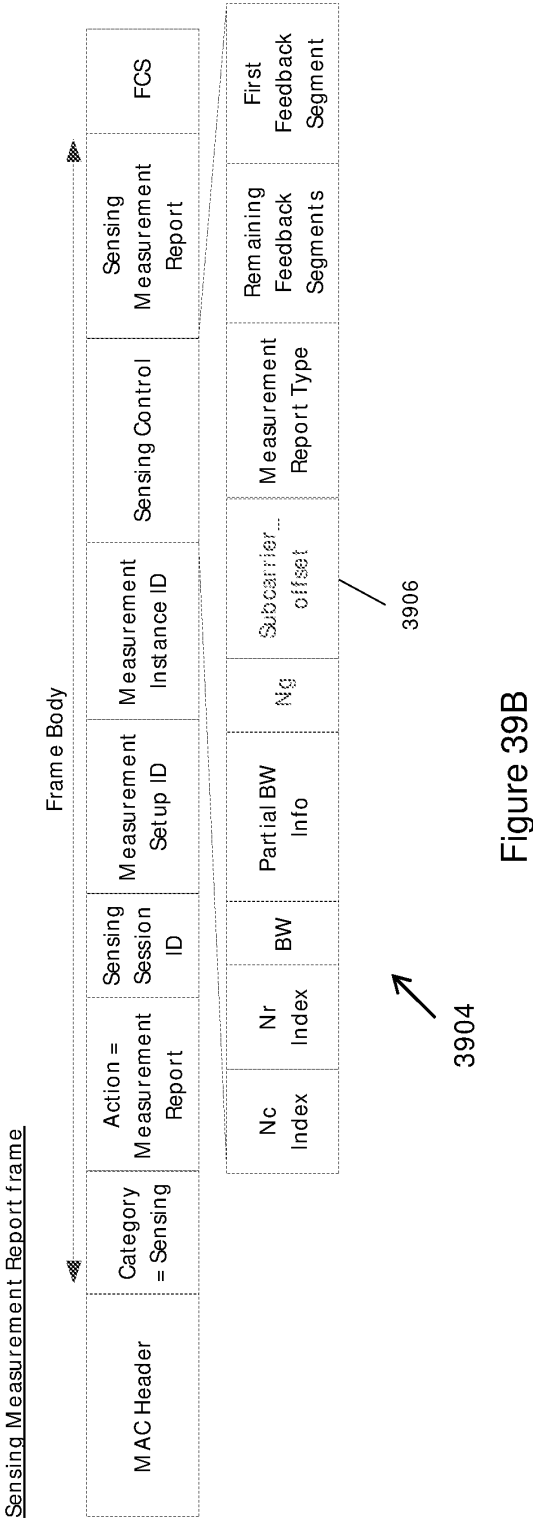
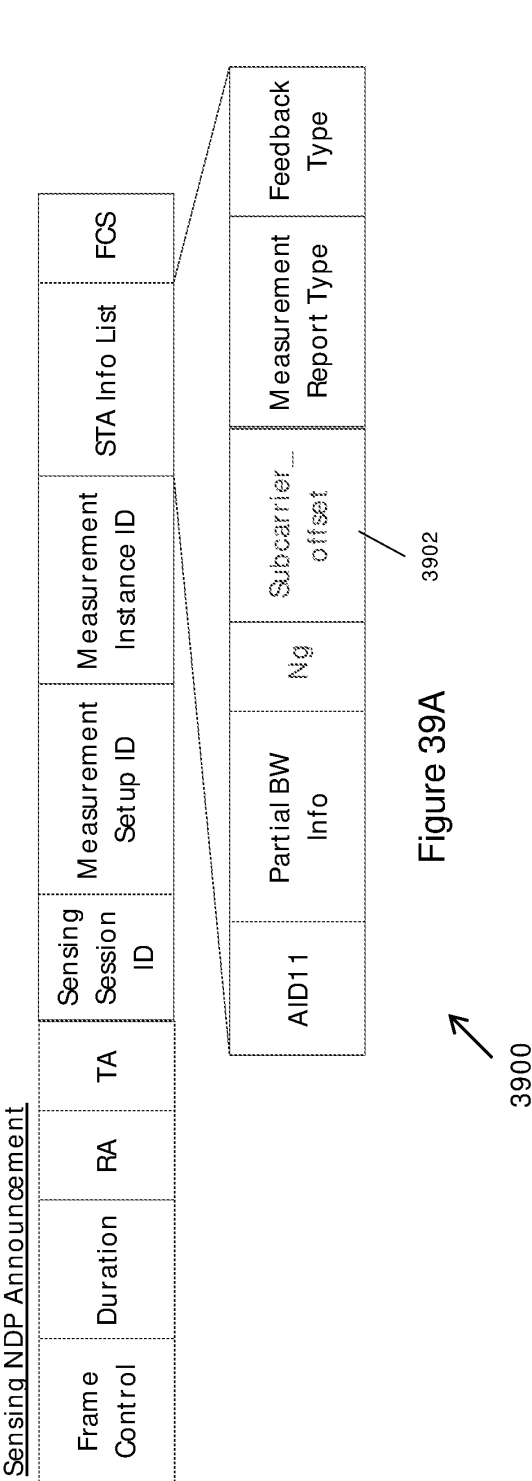


Figure 37

80 MHz			
996-tone RU index	Scidx()	Scidx_new() when subcarrier_offset = 2	Scidx_new() when subcarrier_offset = 8
1	Ng = 4 [-500:4:-4, 4:4:500]	[-498:4:-2, 2:4:498]	-
	Ng = 16 [-500:16:-260,-252:16:-12,-4, 4,12:16:252, 260:16:500]	[-498:16:-258,-250:16:-10,-2, 2,10:16:250, 258:16:498]	[-492:16:-252,-244:16:-4, 4:16:244, 252:16:492]

↗
3800

Figure 38



Sensing NDP Announcement

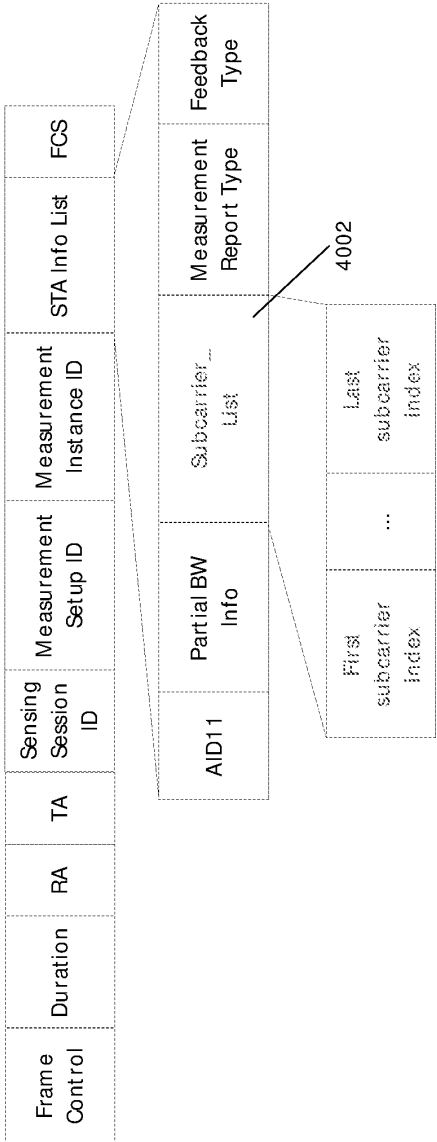


Figure 40A

Sensing Measurement Report frame

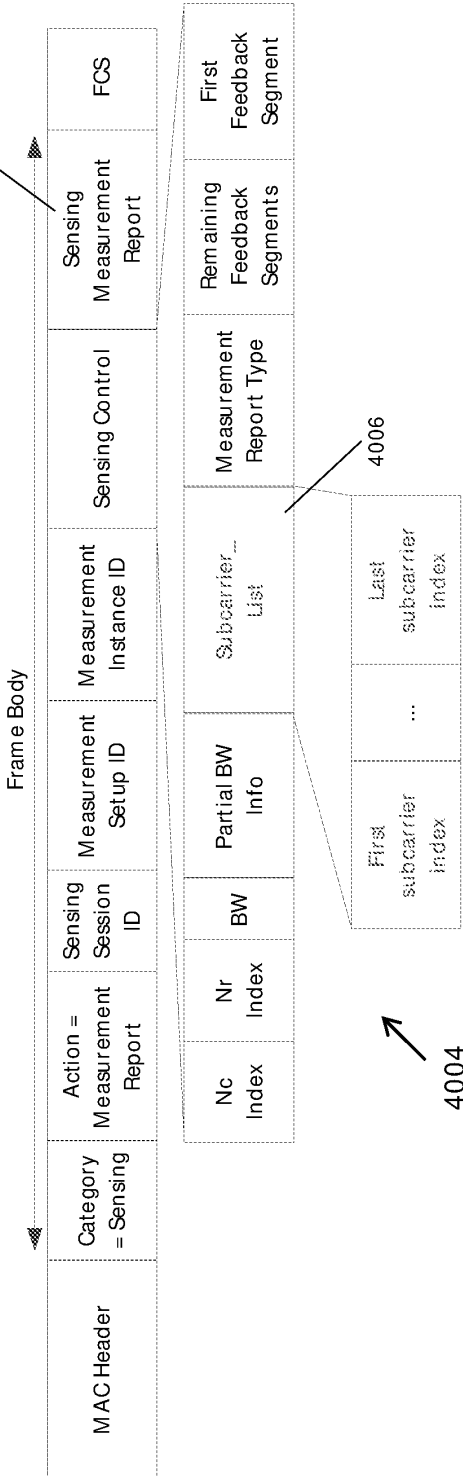
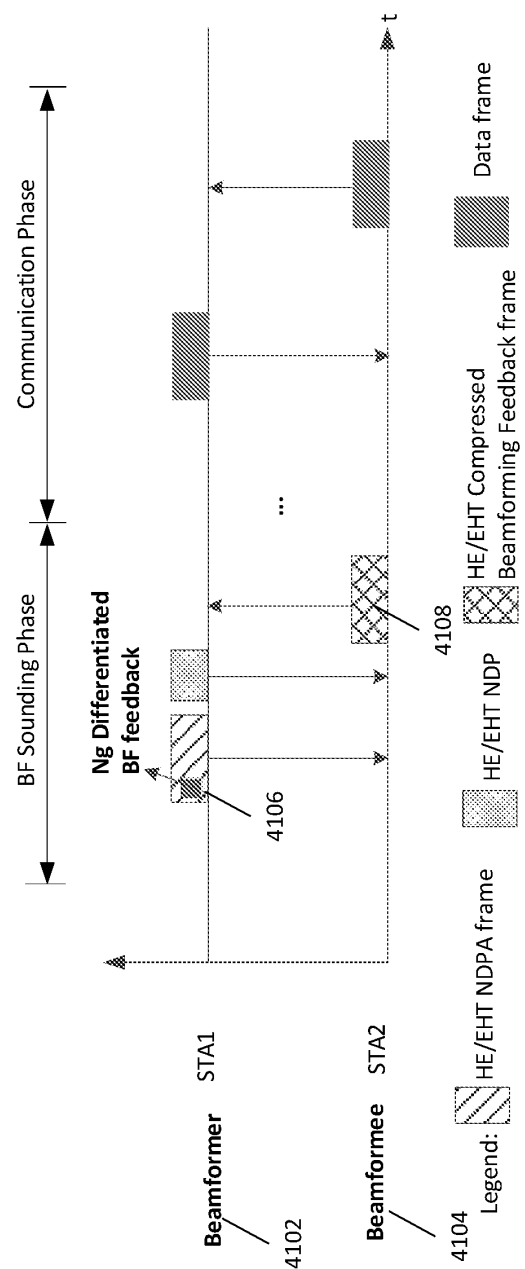
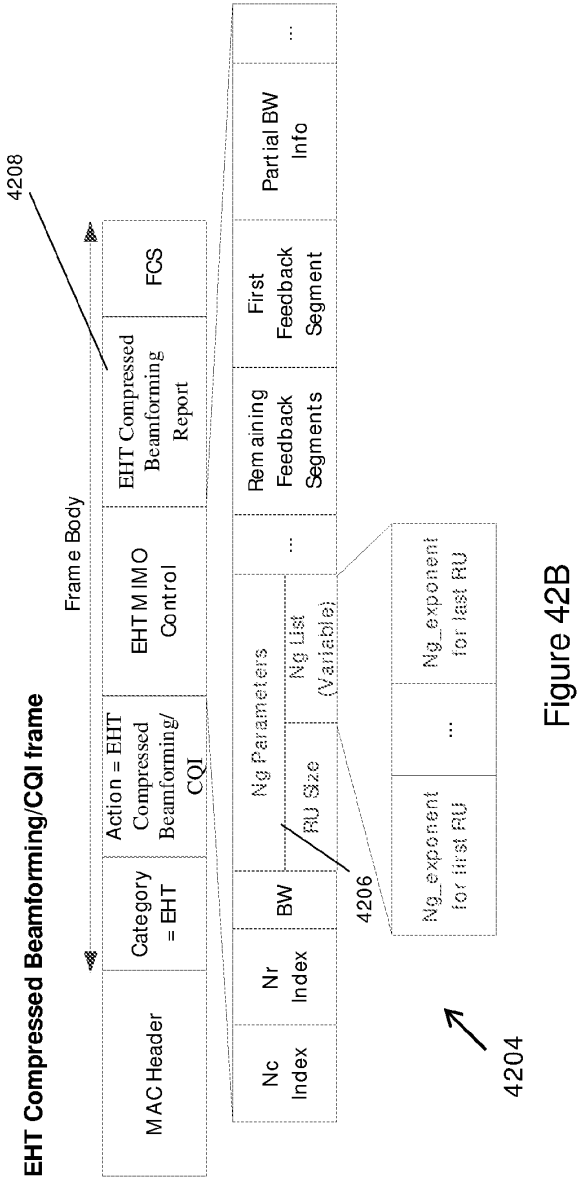
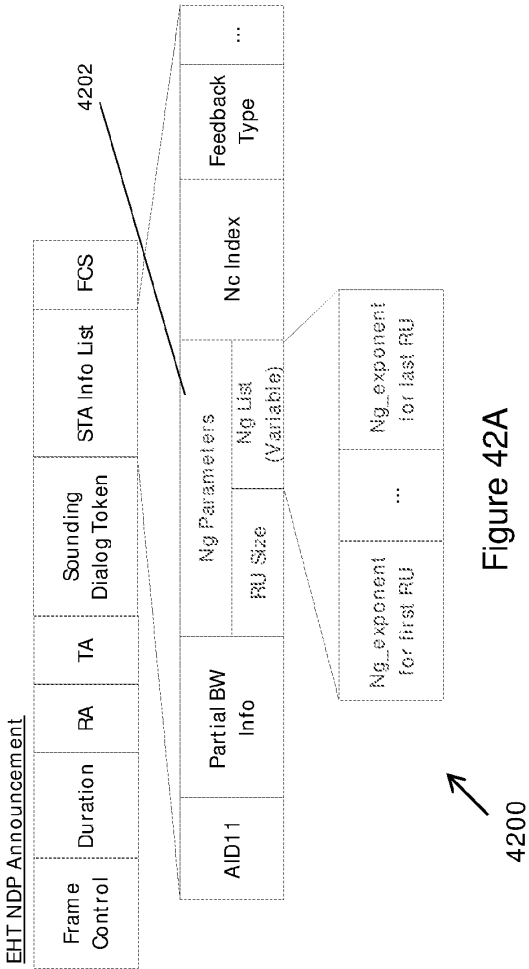


Figure 40B



↗
4100

Figure 41



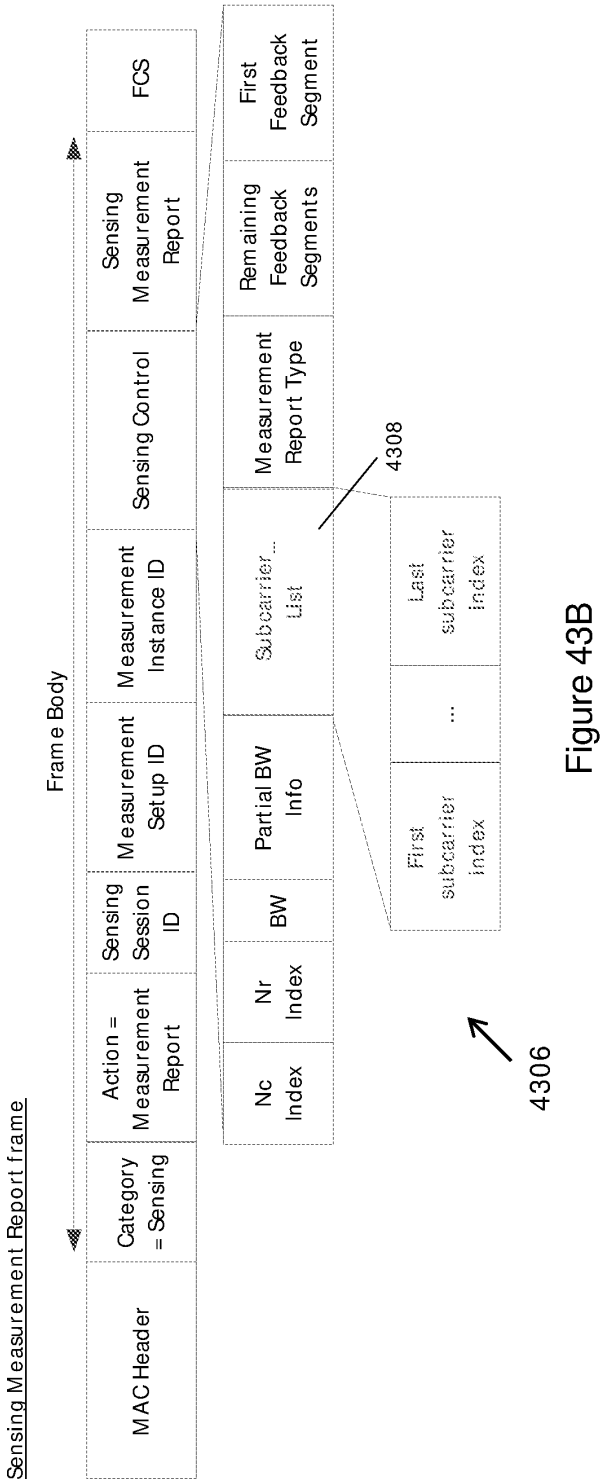
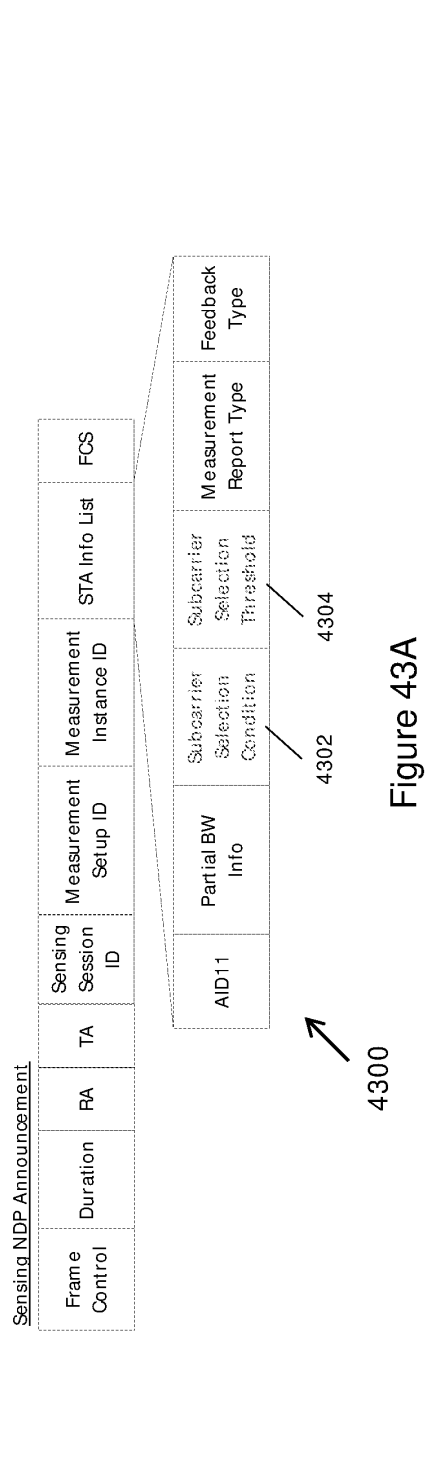


Table - Example encoding of Subcarrier Selection Condition field (2 bits)

Subcarrier Selection Condition	Meaning
0	All subcarrier as per Ng
1	Subcarriers with I & Q values whose difference from a previous measurement is above the threshold value.
2	Subcarriers with Amplitude values whose difference from a previous measurement is above the threshold value.
3	Subcarriers with phase values whose difference from a previous measurement is above the threshold value.

↗
4400

Figure 44

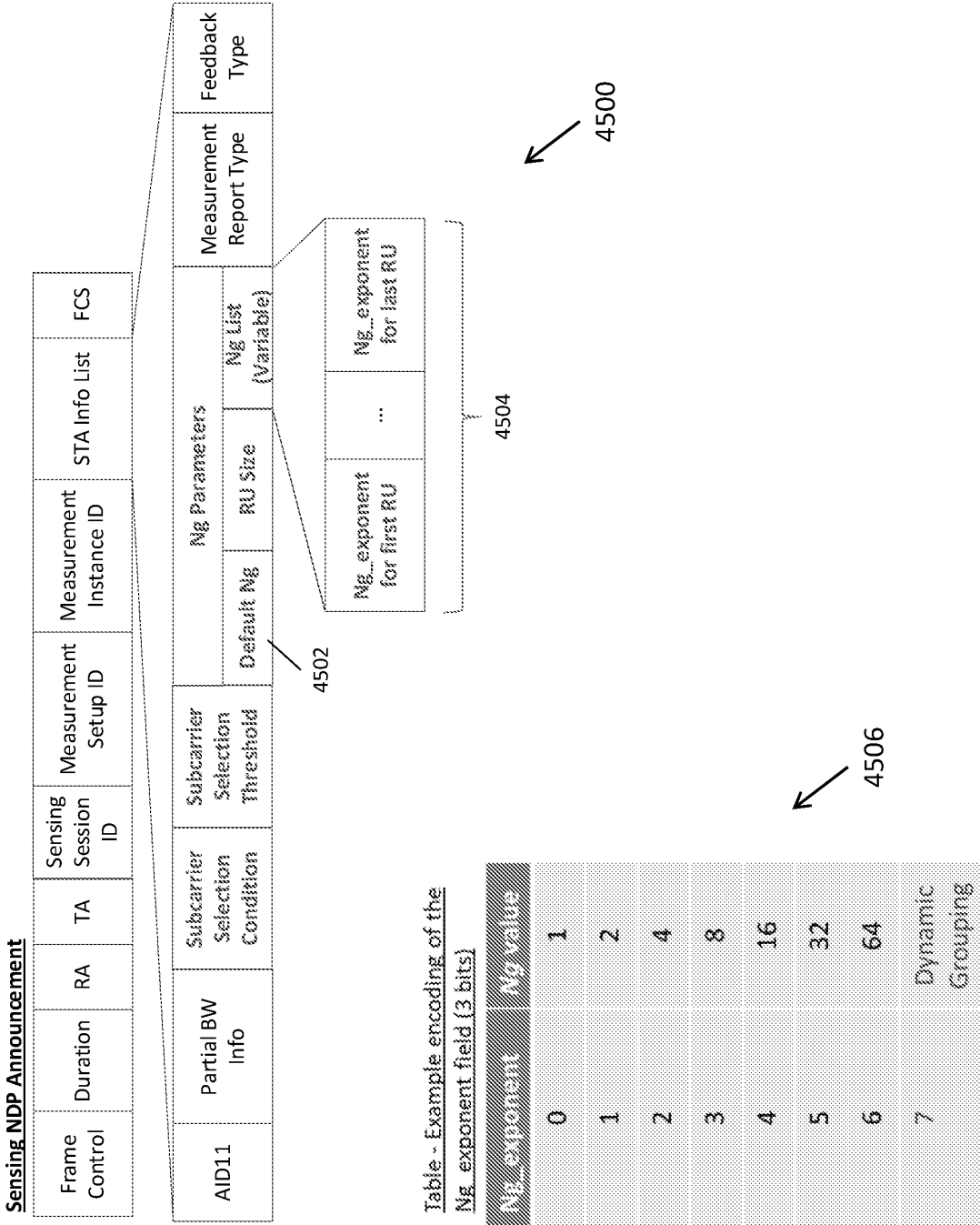


Figure 45

Table – Sensing Measurement Report field (CSI)		
Field	Size (bits)	Meaning
...		
CSI matrix for subcarrier $k = \text{scidx_1st_Segment}(0)$	$3 + 2 \times N_b \times N_c \times N_r$	CSI matrix for the 1 st subcarrier in the 1 st segment (see Figure E1-F1 (CSI Matrix coding))
...		
CSI matrix for subcarrier $k = \text{scidx_1st_Segment}(N_s_1 - 1)$	$3 + 2 \times N_b \times N_c \times N_r$	CSI matrix for the last subcarrier in the 1 st segment
...		
CSI matrix for subcarrier $k = \text{scidx_nth_Segment}(0)$	$3 + 2 \times N_b \times N_c \times N_r$	CSI matrix for the 1 st subcarrier in the n^{th} segment
...		
CSI matrix for subcarrier $k = \text{scidx_nth_Segment}(N_s_n - 1)$	$3 + 2 \times N_b \times N_c \times N_r$	CSI matrix for the last subcarrier in the n^{th} segment
Differential subcarrier index for m^{th} segment $\text{scidx_mth_Segment}(0) \dots \text{scidx_mth_Segment}(1)$	3	Only present for the m^{th} segment with dynamic grouping. Set to j to indicate the distance between the subcarrier indices $\text{scidx_mth_Segment}(0) \dots \text{scidx_mth_Segment}(1)$ as 2 ⁱ
...		
Differential subcarrier index for m^{th} segment $\text{scidx_mth_Segment}(N_s_m - 2) \dots \text{scidx_mth_Segment}(N_s_m - 1)$	3	Only present for the m^{th} segment with dynamic grouping. Set to j to indicate the distance between the subcarrier indices $\text{scidx_mth_Segment}(N_s_m - 2) \dots \text{scidx_mth_Segment}(N_s_m - 1)$ as 2 ⁱ

Figure 46


 4600

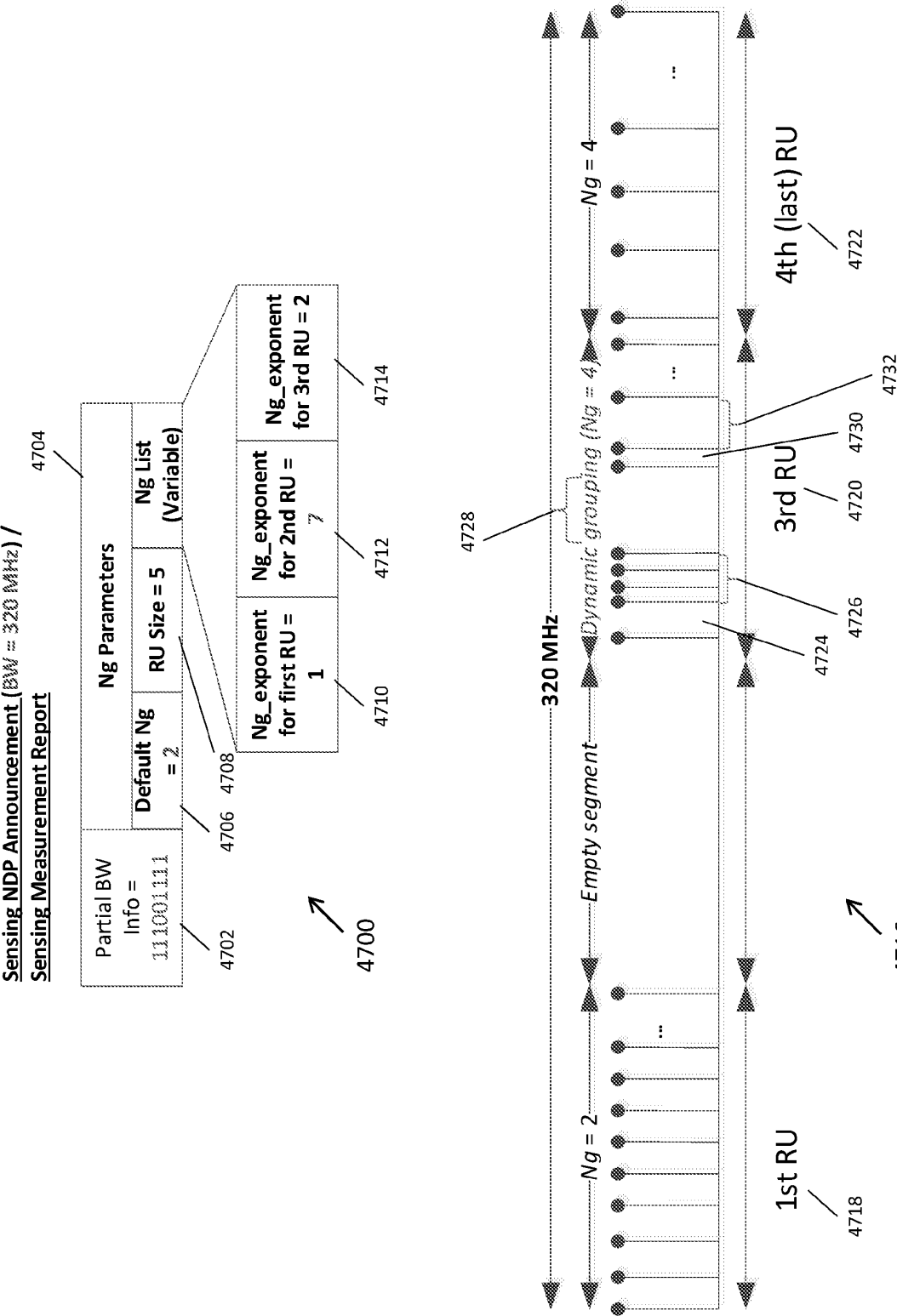


Figure 47

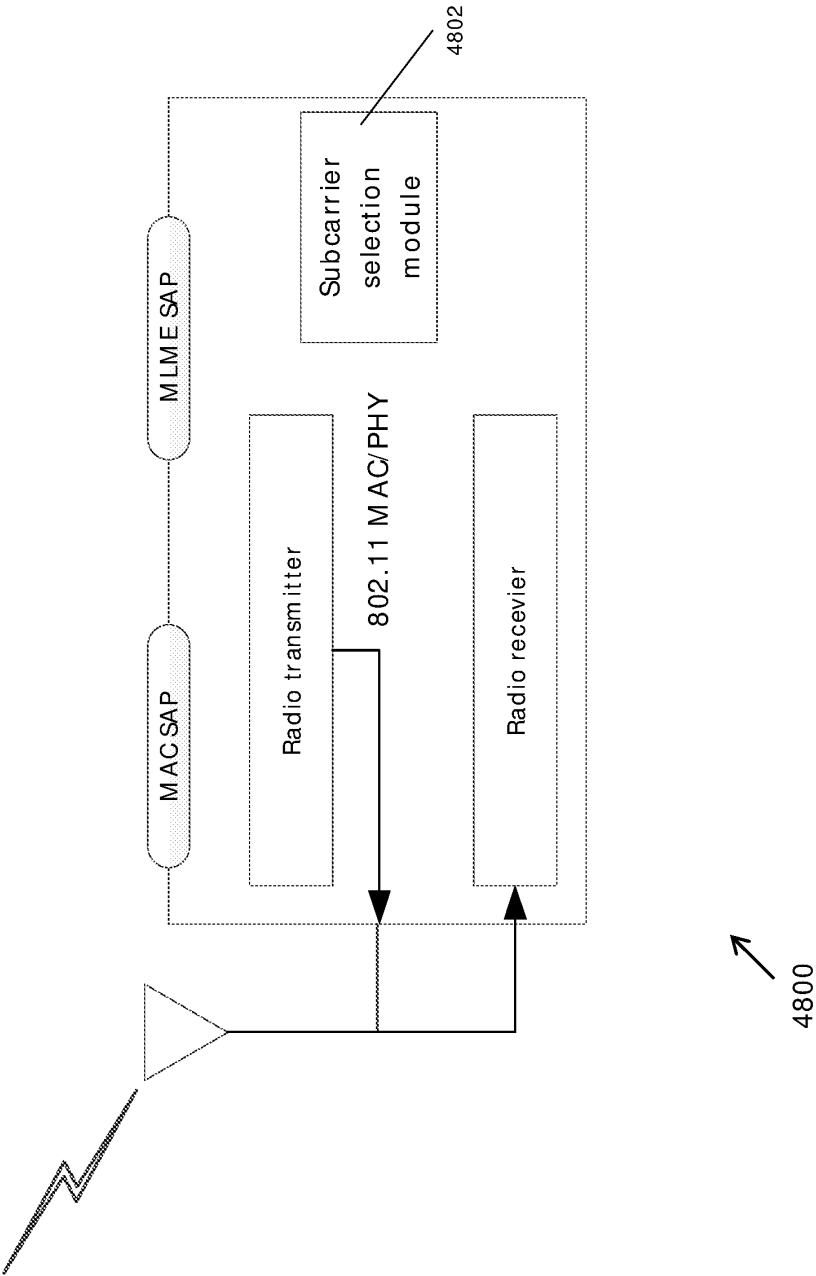


Figure 48

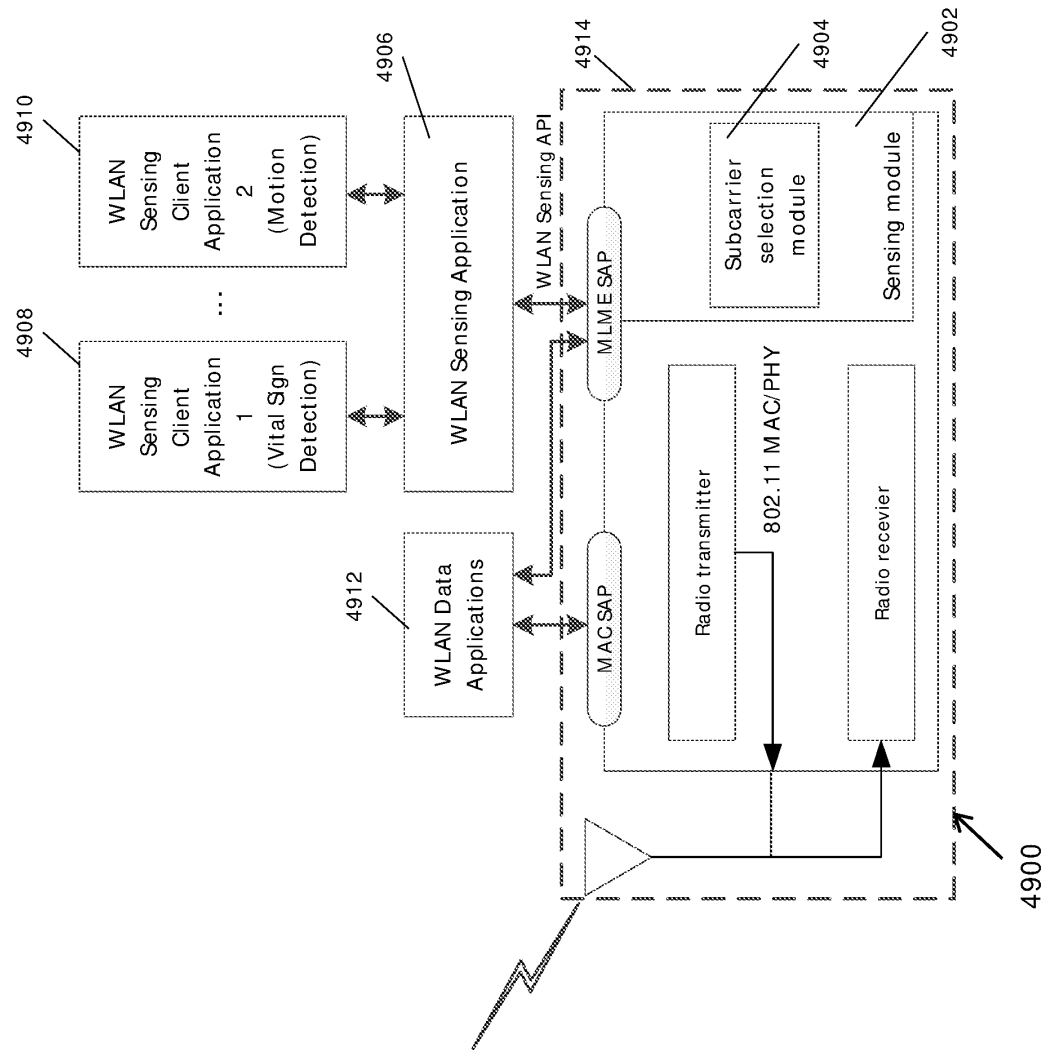


Figure 49

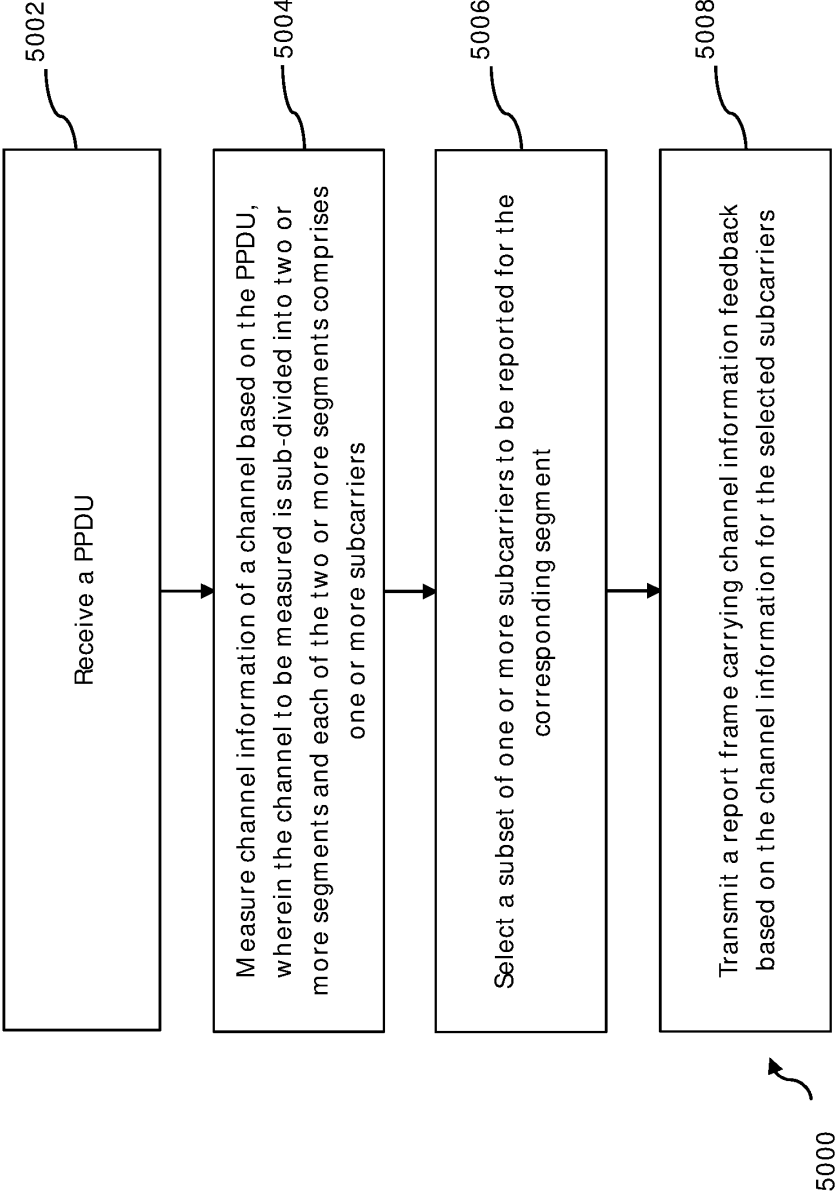


Figure 50

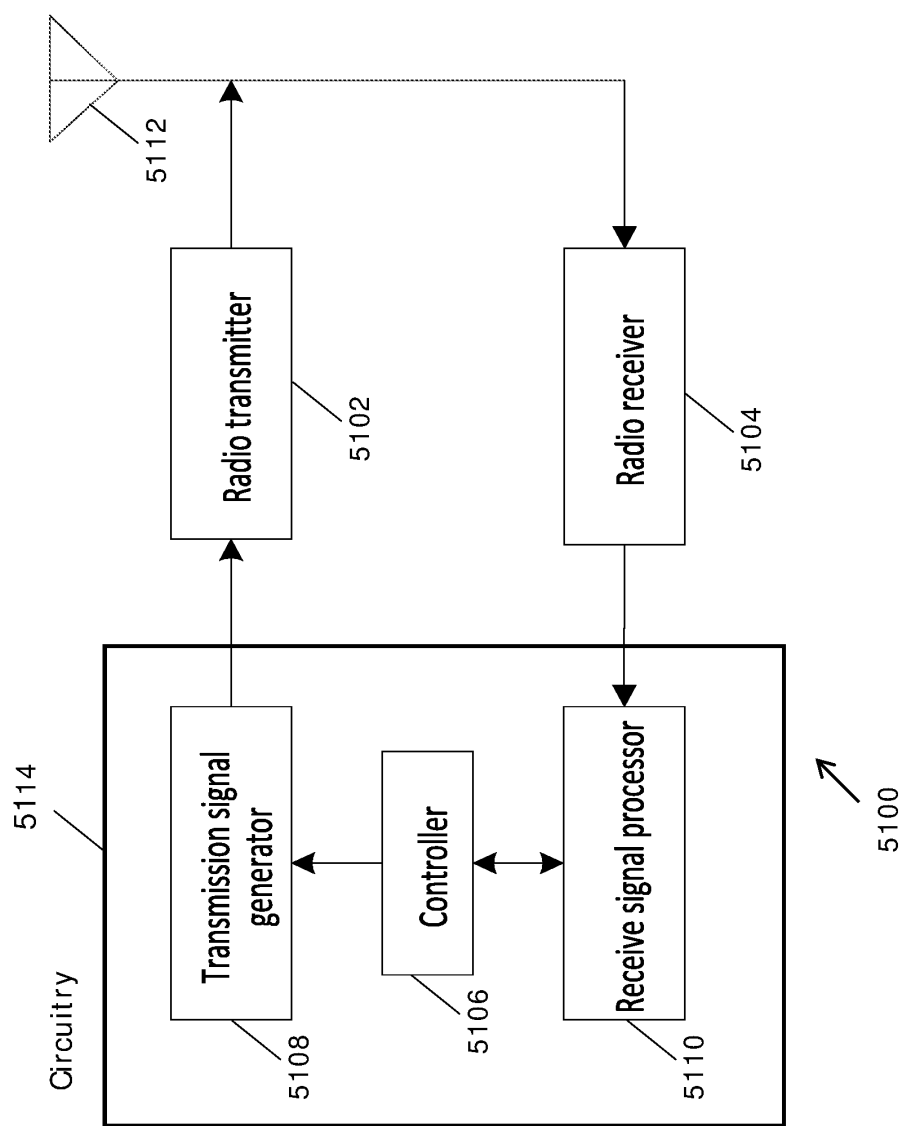


Figure 51