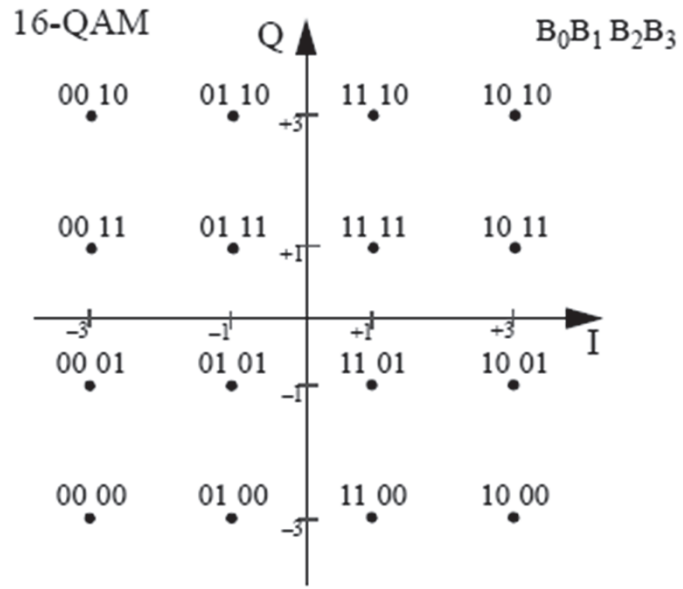
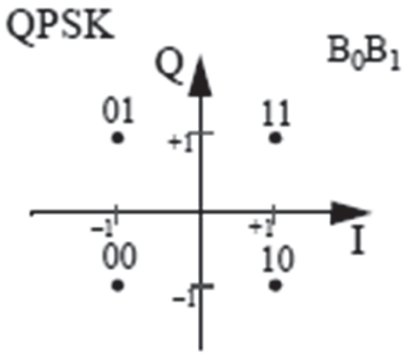


100

Figure 1A



102

Figure 1B

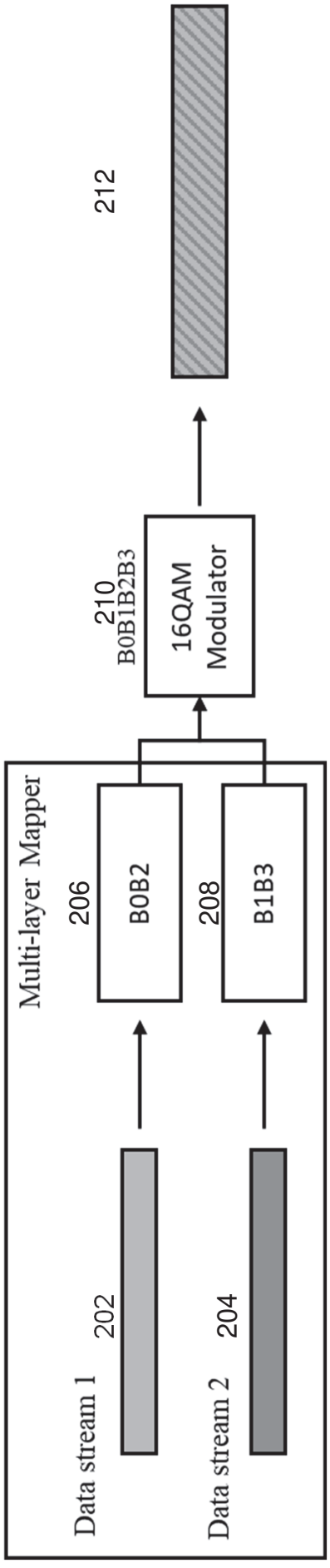

212
210
B0B1B2B3
16QAM
Modulator
Multi-layer Mapper
206
B0B2
208
B1B3
Data stream 1
202
Data stream 2
204
200

Figure 2

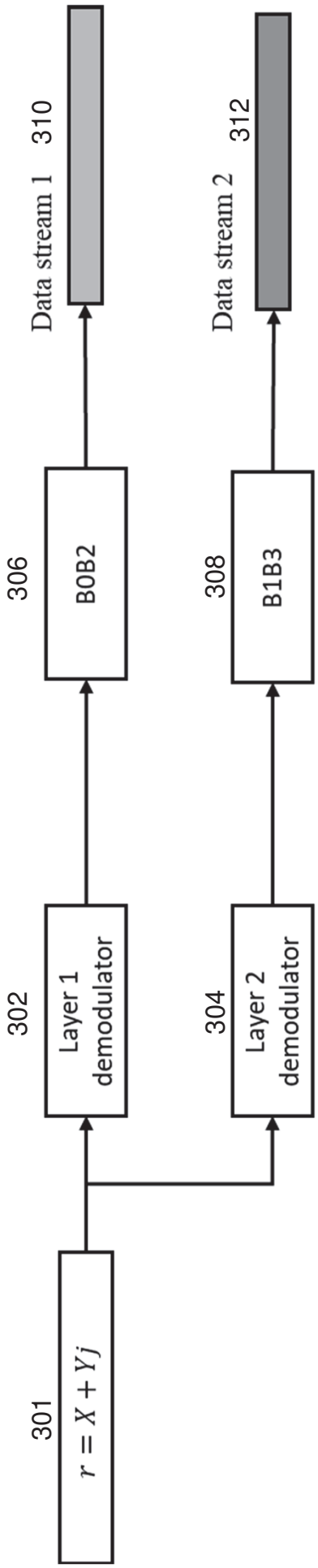

301
$r = X + Yj$
302
Layer 1 demodulator
304
Layer 2 demodulator
306
B0B2
308
B1B3
Data stream 1 310
Data stream 2 312
300

Figure 3

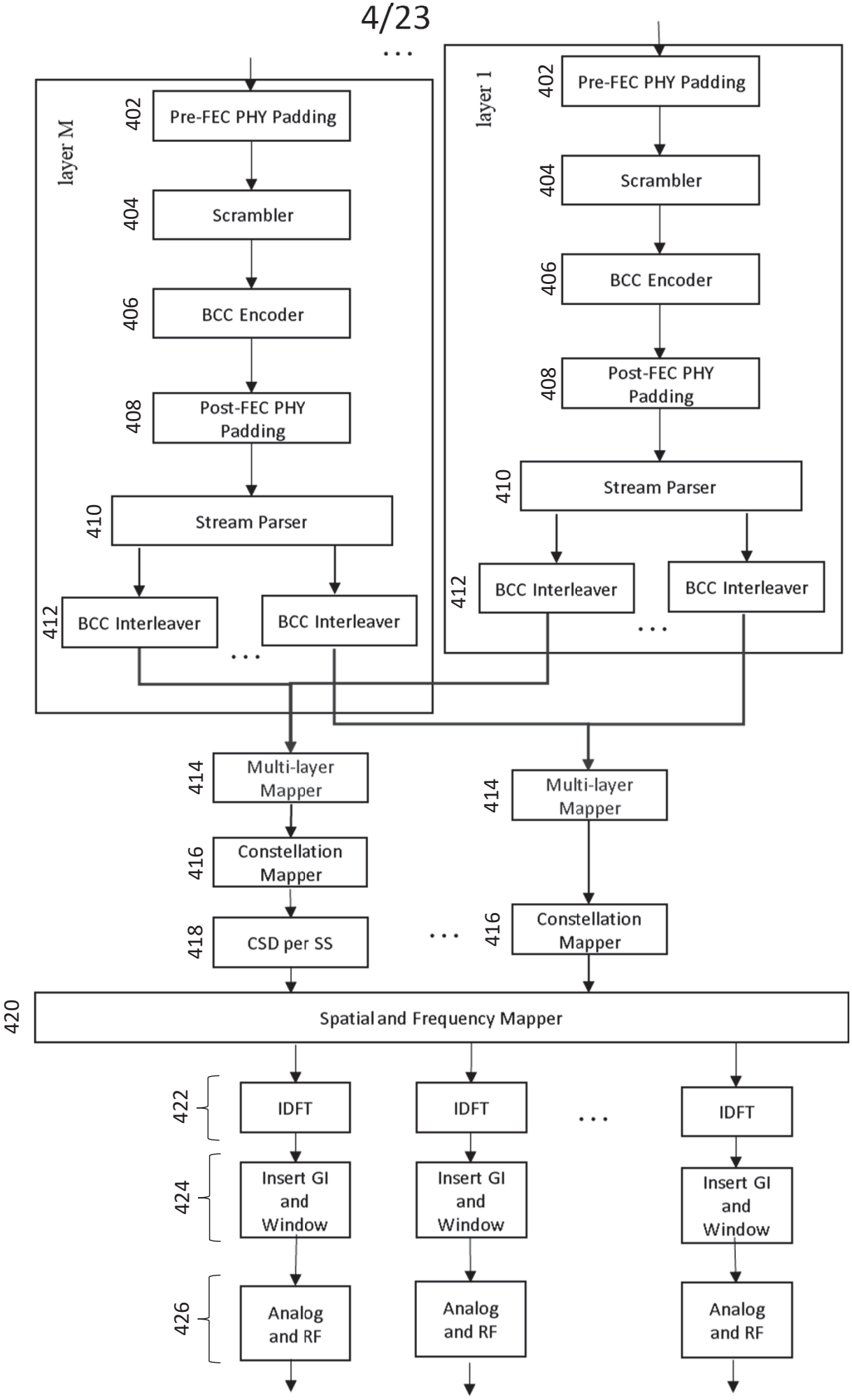

layer M
402
Pre-FEC PHY Padding
404
Scrambler
406
BCC Encoder
408
Post-FEC PHY Padding
410
Stream Parser
412
BCC Interleaver
BCC Interleaver
layer 1
402
Pre-FEC PHY Padding
404
Scrambler
406
BCC Encoder
408
Post-FEC PHY Padding
410
Stream Parser
412
BCC Interleaver
BCC Interleaver
414
Multi-layer Mapper
414
Multi-layer Mapper
416
Constellation Mapper
416
Constellation Mapper
418
CSD per SS
420
Spatial and Frequency Mapper
422
IDFT
IDFT
IDFT
424
Insert GI and Window
Insert GI and Window
Insert GI and Window
426
Analog and RF
Analog and RF
Analog and RF
400

Figure 4

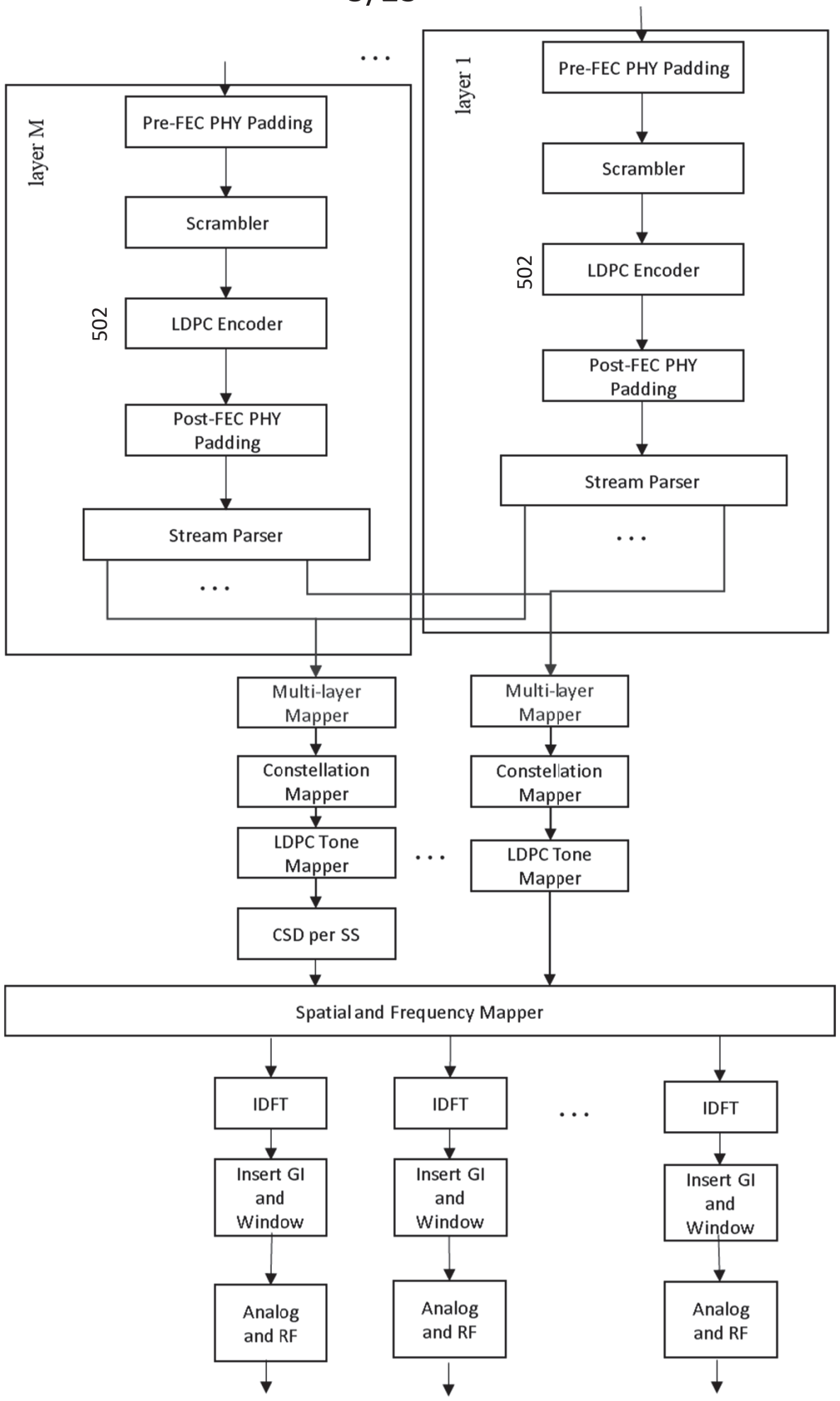

layer M
Pre-FEC PHY Padding
Scrambler
502
LDPC Encoder
Post-FEC PHY Padding
Stream Parser
layer 1
Pre-FEC PHY Padding
Scrambler
502
LDPC Encoder
Post-FEC PHY Padding
Stream Parser
Multi-layer Mapper
Constellation Mapper
LDPC Tone Mapper
CSD per SS
Multi-layer Mapper
Constellation Mapper
LDPC Tone Mapper
Spatial and Frequency Mapper
IDFT
Insert GI and Window
Analog and RF
IDFT
Insert GI and Window
Analog and RF
IDFT
Insert GI and Window
Analog and RF
500

Figure 5

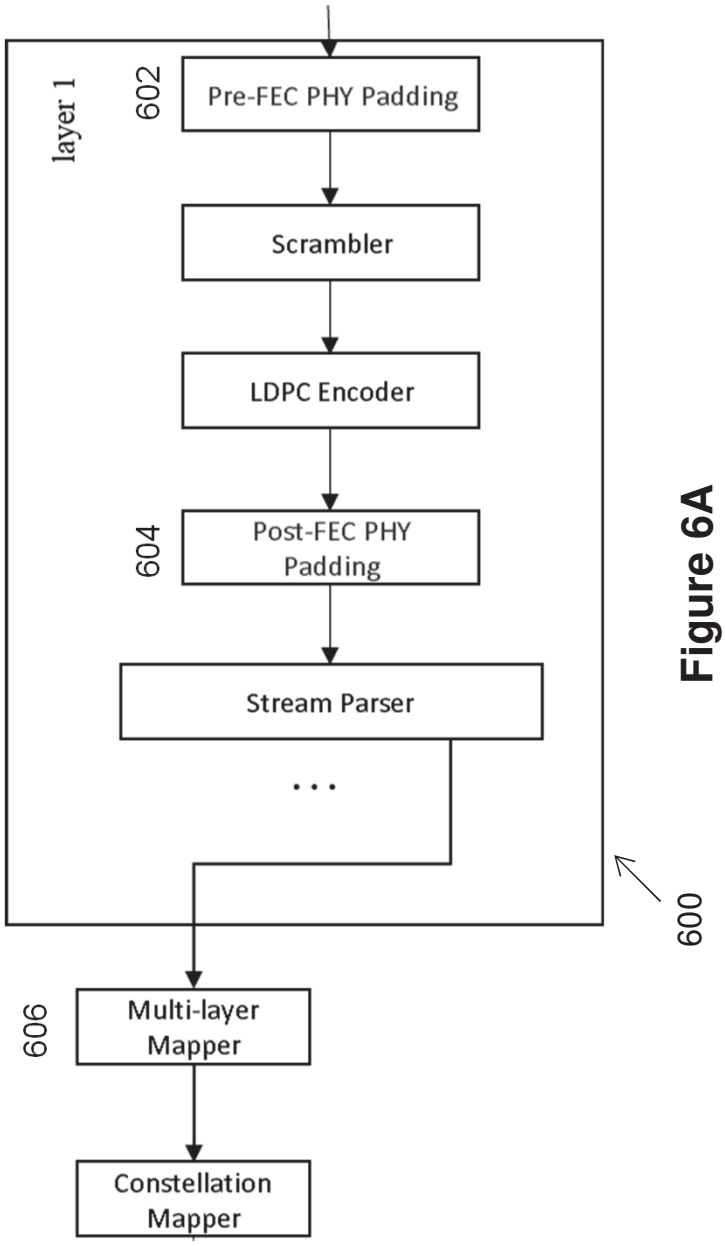


Figure 6A

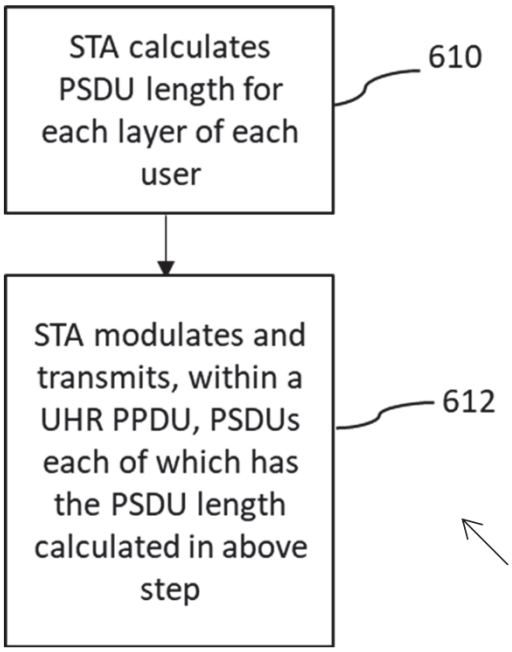


Figure 6B

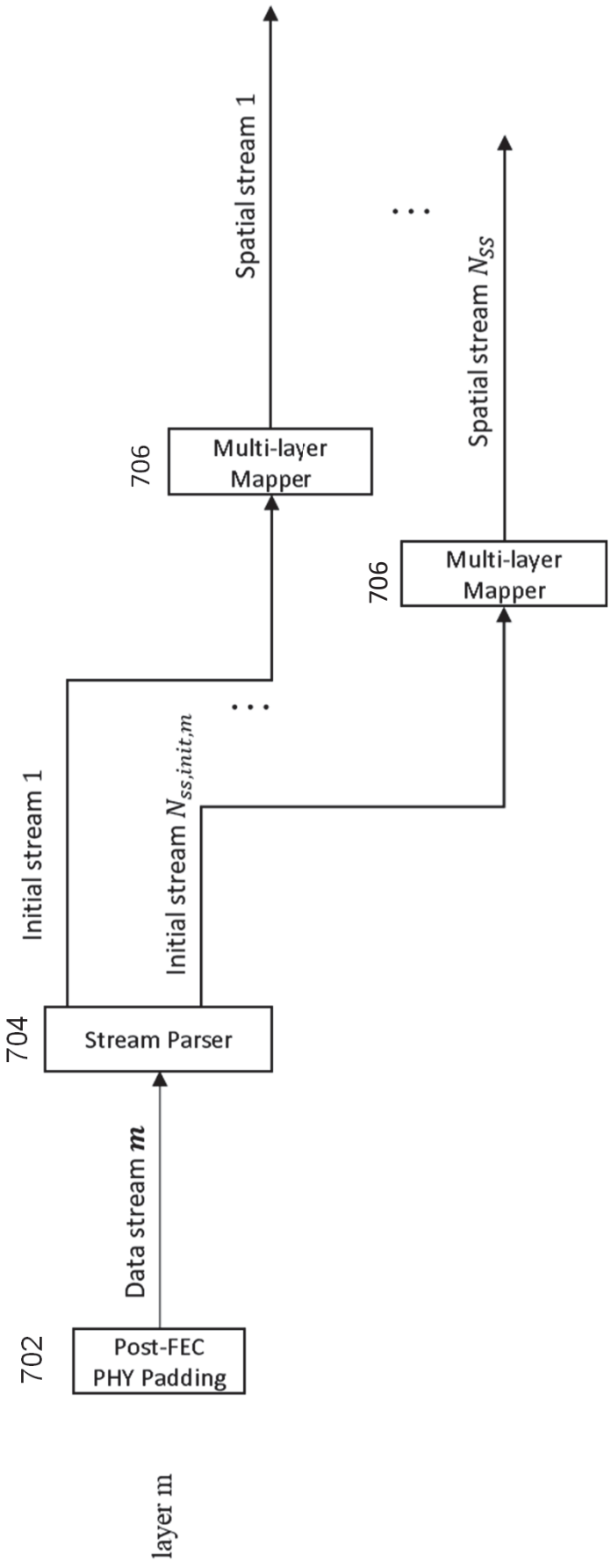

layer m
Post-FEC PHY Padding
702
Data stream m
Stream Parser
704
Initial stream 1
Initial stream $N_{ss,init,m}$
Multi-layer Mapper
706
Multi-layer Mapper
706
Spatial stream 1
Spatial stream N_{SS}
700

Figure 7

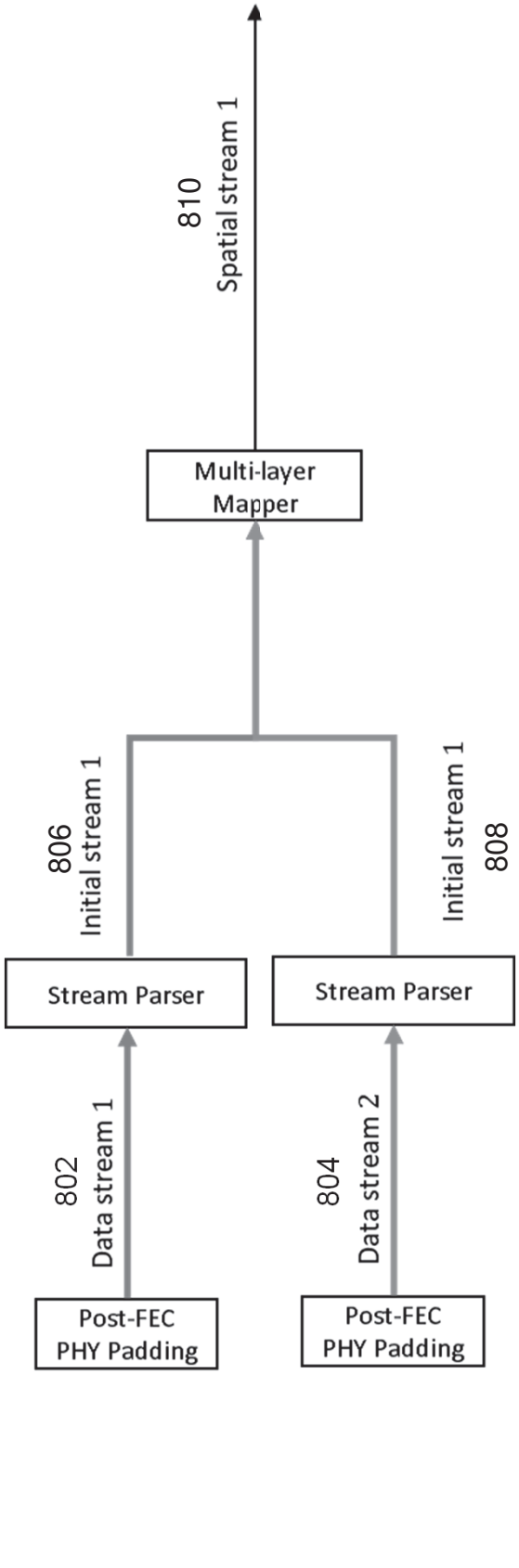

810
Spatial stream 1
Multi-layer Mapper
806
Initial stream 1
808
Initial stream 1
Stream Parser
Stream Parser
802
Data stream 1
804
Data stream 2
Post-FEC PHY Padding
Post-FEC PHY Padding
800

Figure 8

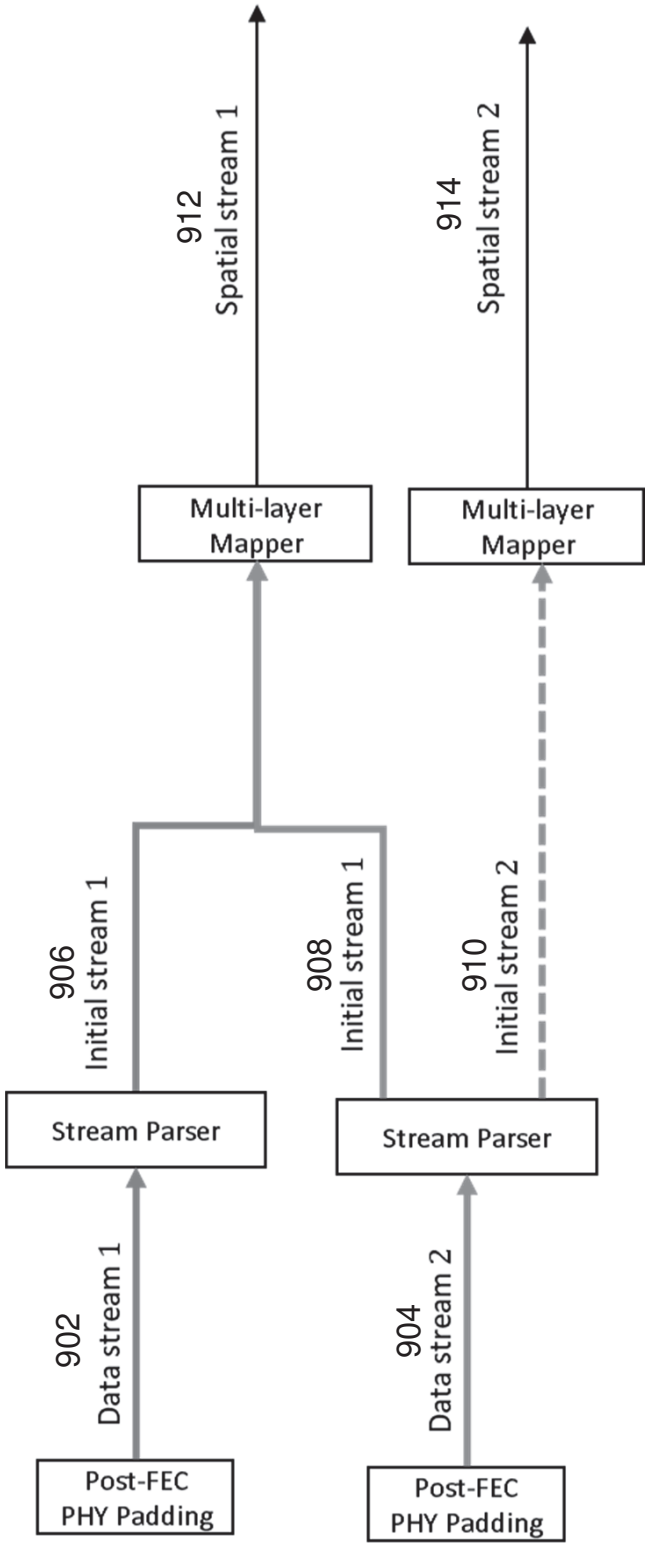

912
Spatial stream 1
914
Spatial stream 2
Multi-layer Mapper
Multi-layer Mapper
906
Initial stream 1
908
Initial stream 1
910
Initial stream 2
Stream Parser
Stream Parser
902
Data stream 1
904
Data stream 2
Post-FEC PHY Padding
Post-FEC PHY Padding
900

Figure 9

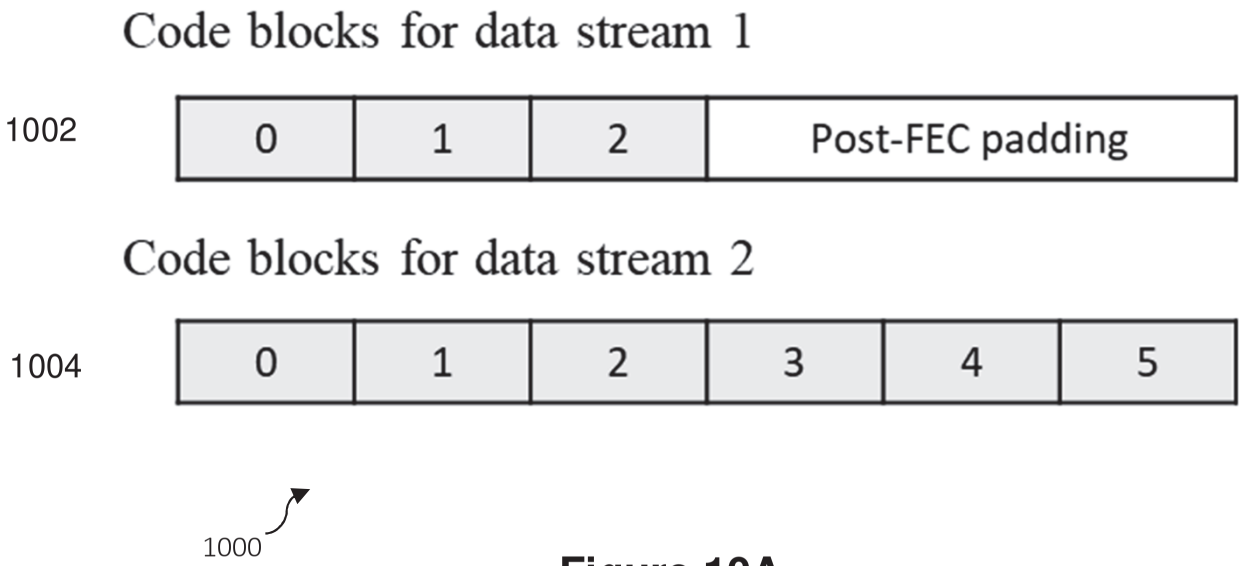


Figure 10A

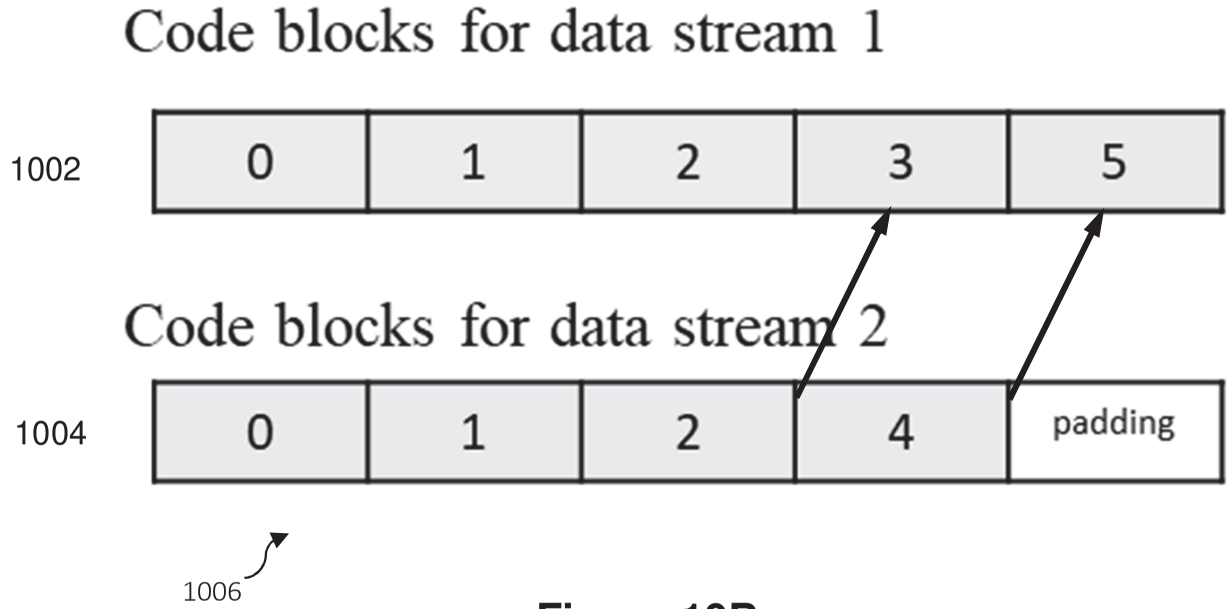


Figure 10B

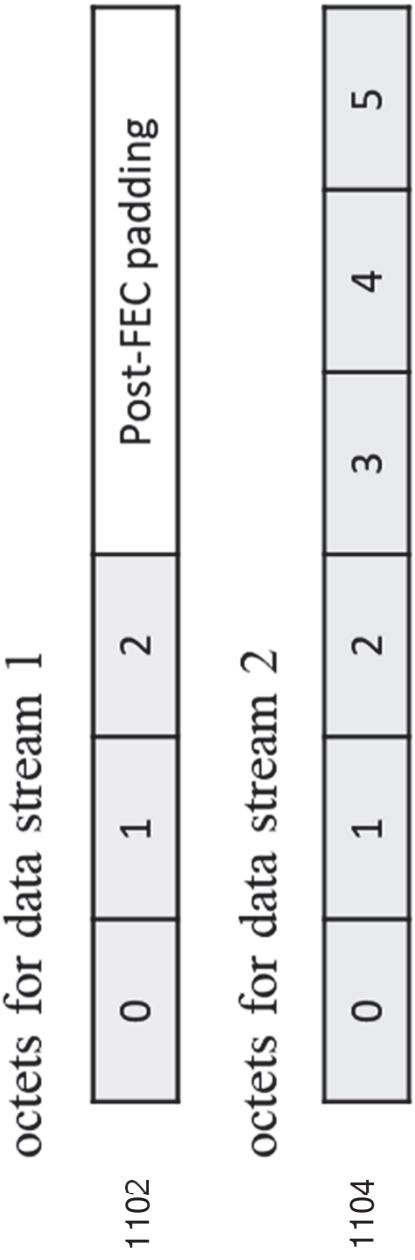


Figure 11A

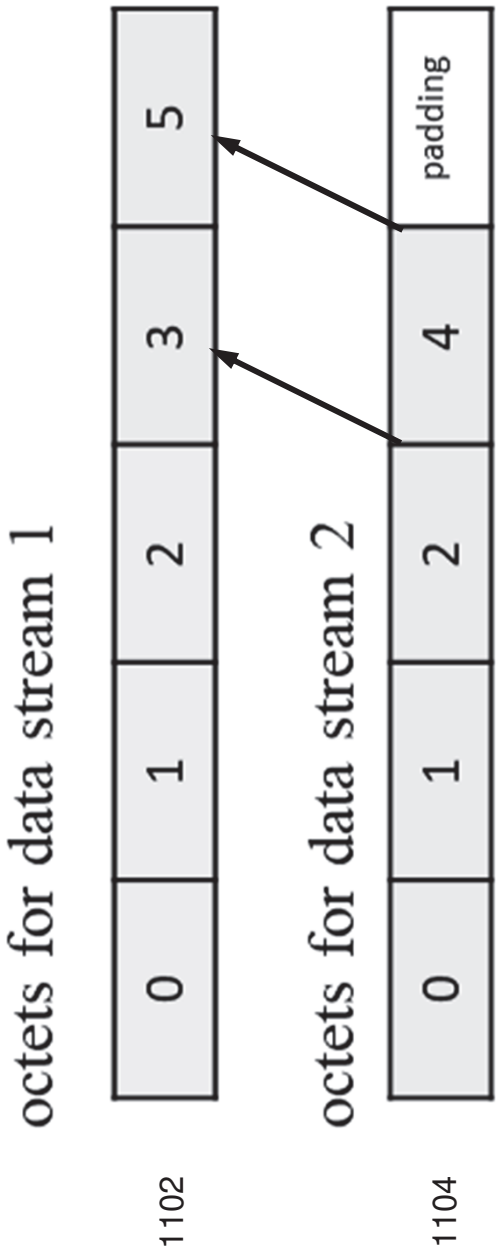


Figure 11B

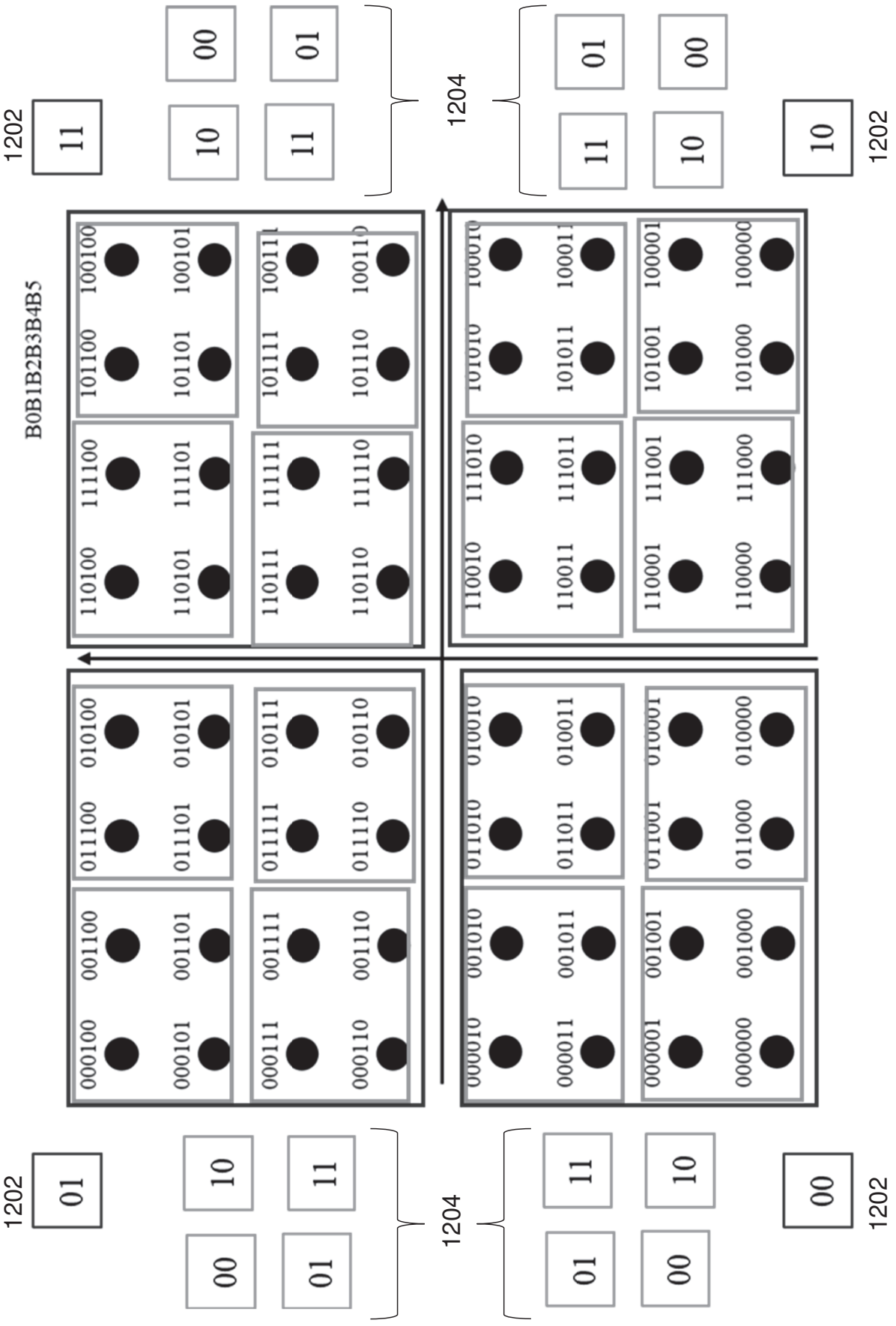
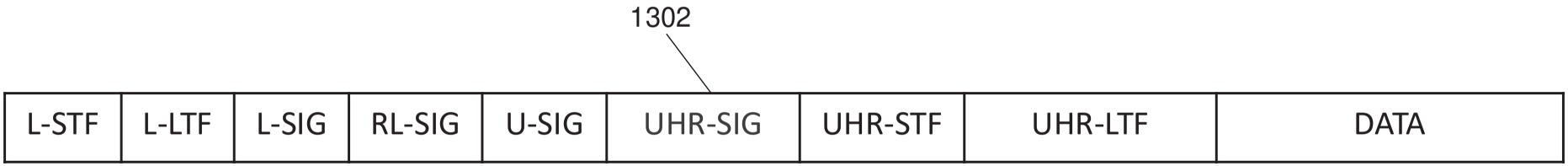

B0B1B2B3B4B5
1202
11
00
10
01
1204
1202
01
10
11
00
1204
1202
10
01
11
00
1202
1200

Figure 12



Bit	Subfield	Number of bits
B0-B10	STA-ID	11
B11-B14	MCS	4
B15	Multi-layer Flag	1
B16-B19	NSS	4
B20	Beamformed	1
B21	Coding	1

1306

1304

Figure 13

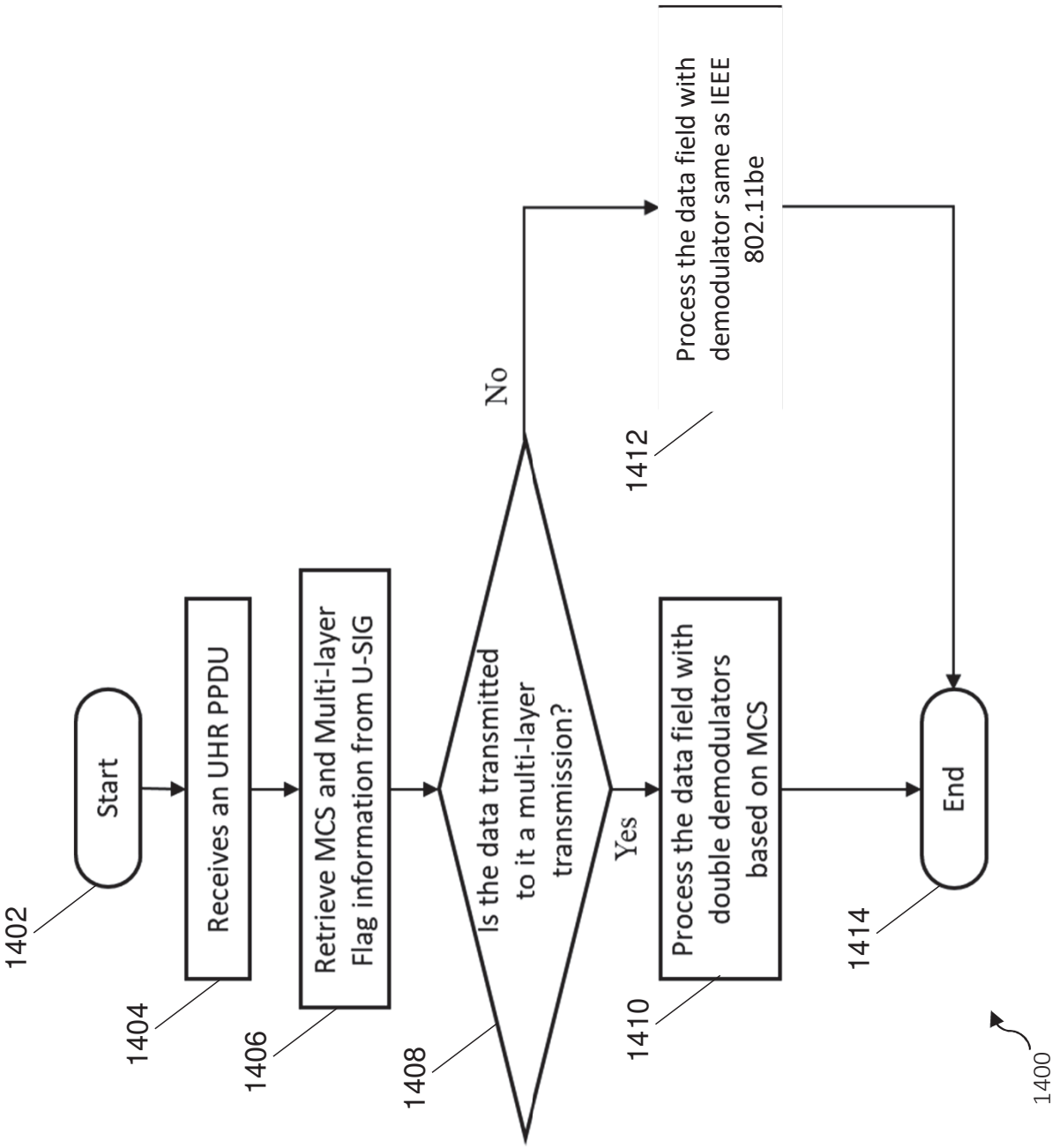

Start
Receives an UHR PPDU
Retrieve MCS and Multi-layer Flag information from U-SIG
Is the data transmitted to it a multi-layer transmission?
No
Yes
Process the data field with demodulator same as IEEE 802.11be
Process the data field with double demodulators based on MCS
End
1402
1404
1406
1408
1410
1412
1414
1400

Figure 14

Index	QAM Level	Layer 1		Layer 2		Layer 3	
		Input bits	SDER	Input bits	SDER	Input bits	SDER
1	16-QAM	B0B2	QPSK	B1B3	-	-	-
1	64-QAM	B0B3	QPSK	B1B2B4B5	-	-	-
2		B0B3	QPSK	B1B4	16-QAM	B2B5	-
3		B0B1B3B4	16-QAM	B2B5	-	-	-



Figure 15

Index	QAM Level	Layer 1		Layer 2		Layer 3		Layer 4	
		Input bits	SDER	Input bits	SDER	Input bits	SDER	Input bits	SDER
1	256-QAM	B0B4	QPSK	B1B2B3B5B6B7	-	-	-	-	-
2		B0B4		B1B5	16-QAM	B2B3B6B7	-	-	-
3		B0B4		B1B5		B2B6	64-QAM	B3B7	-
4		B0B4		B1B2B5B6	64-QAM	B3B7	-	-	-
5		B0B1B4B5	16-QAM	B2B6	64-QAM	B3B7	-	-	-
6		B0B1B4B5		B2B3B6B7	-	-	-	-	-

1600

Figure 16

Index	QAM Level	Layer 1		Layer 2		Layer 3		Layer 4		Layer 5	
		Input bits	SDER	Input bits	SDER	Input bits	SDER	Input bits	SDER	Input bits	SDER
1	1024-QAM	B0B5	QPSK	B1B2B3B4B6B7B8B9	-	-	-	-	-	-	-
2		B0B5		B1B6	16-QAM	B2B3B4B7B8B9	-	-	-	-	-
3		B0B5		B1B6		B2B7	64-QAM	B3B4B8B9	-	-	-
4		B0B5		B1B6		B2B7		B3B8	256-QAM	B4B9	-
5		B0B5		B1B2B6B7	64-QAM	B3B8	256-QAM	B4B9	-	-	-
6		B0B5		B1B2B6B7		B3B4B8B9	-	-	-	-	-
7		B0B5		B1B2B3B6B7B8	256-QAM	B4B9	-	-	-	-	-
8		B0B1B5B6	16-QAM	B2B3B4B7B8B9	-	-	-	-	-	-	-
9		B0B1B5B6		B2B7	64-QAM	B3B8	256-QAM	B4B9	-	-	-
10		B0B1B5B6		B2B7		B3B4B8B9	-	-	-	-	-
11		B0B1B5B6		B2B3B7B8	256-QAM	B4B9	-	-	-	-	-
12		B0B1B2B5B6B7	64-QAM	B3B4B8B9	-	-	-	-	-	-	-
13		B0B1B2B5B6B7		B3B8	256-QAM	B4B9	-	-	-	-	-
14		B0B1B2B3B5B6B7B8	256-QAM	B4B9	-	-	-	-	-	-	-

1700

Figure 17

Index	QAM Level	Layer 1		Layer 2		Layer 3		Layer 4		Layer 5		Layer 6	
		Input bits	SDER	Input bits	SDER	Input bits	SDER	Input bits	SDER	Input bits	SDER	Input bits	SDER
1	4096-QAM	B0B6	QPSK	B1-B5; B7-B11	-	-	-	-	-	-	-	-	-
2		B0B6		B1B7	16-QAM	B2-B5; B8-B11	-	-	-	-	-	-	-
3		B0B6		B1B7		B2B8	64-QAM	B3-B5; B9-B11	-	-	-	-	-
4		B0B6		B1B7		B2B8		B3B9	256-QAM	B4B5B10B11	-	-	-
5		B0B6		B1B7		B2B8		B3B9		B4B10	1024-QAM	B5B11	-
6		B0B6		B1B2 B7B8	64-QAM	B3B9	256-QAM	B4B10	1024-QAM	B5B11	-		
7		B0B6		B1B2 B7B8		B3B9		B4B5 B10B11	-	-	-	-	-
8		B0B6		B1B2 B7B8		B3B4 B9B10	1024-QAM	B5B11	-	-	-	-	-
9		B0B6		B1-B3; B7-B9	256-QAM	B4B10	1024-QAM	B5B11	-	-	-	-	-
10		B0B6		B1-B3; B7-B9		B4B5 B10B11	-	-	-	-	-	-	-
11		B0B6		B1-B4; B7-B10	1024-QAM	B5B11	-	-	-	-	-	-	-

1800

Figure 18

Index	QAM Level	Layer 1		Layer 2		Layer 3		Layer 4		Layer 5		Layer 6	
		Input bits	SDER	Input bits	SDER	Input bits	SDER	Input bits	SDER	Input bits	SDER	Input bits	SDER
12	4096-QAM	B0B1B6B7	16-QAM	B2-B5; B8-B11	-	-	-	-	-	-	-	-	-
13		B0B1B6B7		B2B8	64-QAM	B3-B5; B9-B11	-	-	-	-	-	-	-
14		B0B1B6B7		B2B8		B3B9	256-QAM	B4B5B10B11	-	-	-	-	-
15		B0B1B6B7		B2B8		B3B9		B4B10	1024-QAM	B5B11	-	-	-
16		B0B1B6B7		B2B3 B8B9	256-QAM	B4B10	1024-QAM	B5B11	-	-	-	-	-
17		B0B1B6B7		B2B3 B8B9		B4B5 B10B11	-	-	-	-	-	-	-
18		B0B1B6B7		B2-B4; B8-B10	1024-QAM	B5B11	-	-	-	-	-	-	-
19		B0-B2; B6-B8	64-QAM	B3-B5; B9-B11	-	-	-	-	-	-	-	-	-
20		B0-B2; B6-B8		B3B9	256-QAM	B4B5 B10B11	-	-	-	-	-	-	-
21		B0-B2; B6-B8		B3B9		B4B10	1024-QAM	B5B11	-	-	-	-	-
22		B0-B3; B6-B9	256-QAM	B4B5 B10B11	-	-	-	-	-	-	-	-	-
23		B0-B3; B6-B9		B4B10	1024-QAM	B5B11	-	-	-	-	-	-	-
24		B0-B4; B6-B10	1024-QAM	B5B11	-	-	-	-	-	-	-	-	-

1900

Figure 19

Bit	Subfield	Number of bits
B0-B10	STA-ID	11
B11-B15	MCS and Multi-layer Combinations	5
B16-B19	NSS	4
B20	Beamformed	1
B21	Coding	1

2002

2000

Figure 20

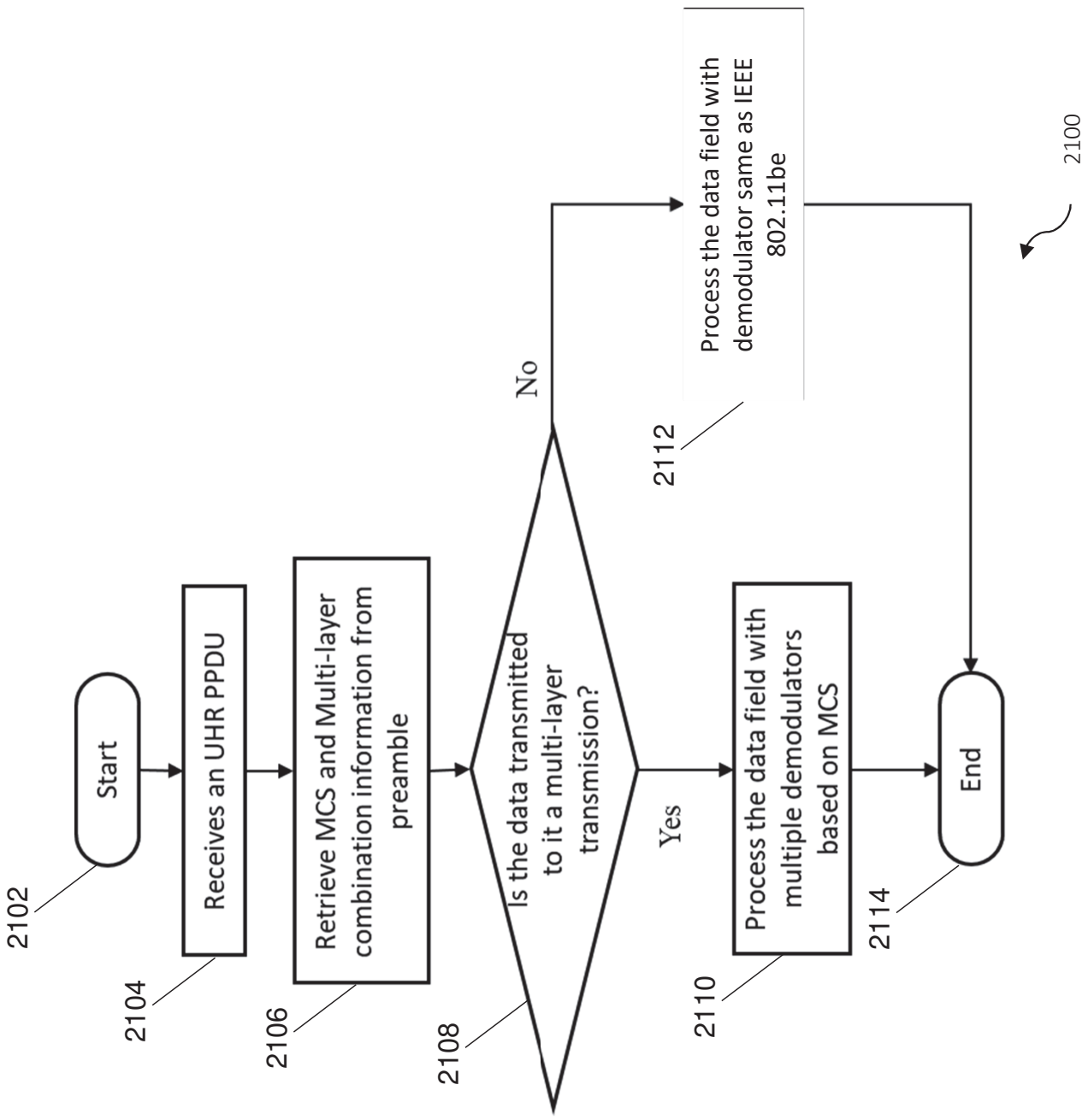

Start
Receives an UHR PPDU
Retrieve MCS and Multi-layer combination information from preamble
Is the data transmitted to it a multi-layer transmission?
No
Yes
Process the data field with demodulator same as IEEE 802.11be
Process the data field with multiple demodulators based on MCS
End
2102
2104
2106
2108
2110
2112
2114
2100

Figure 21

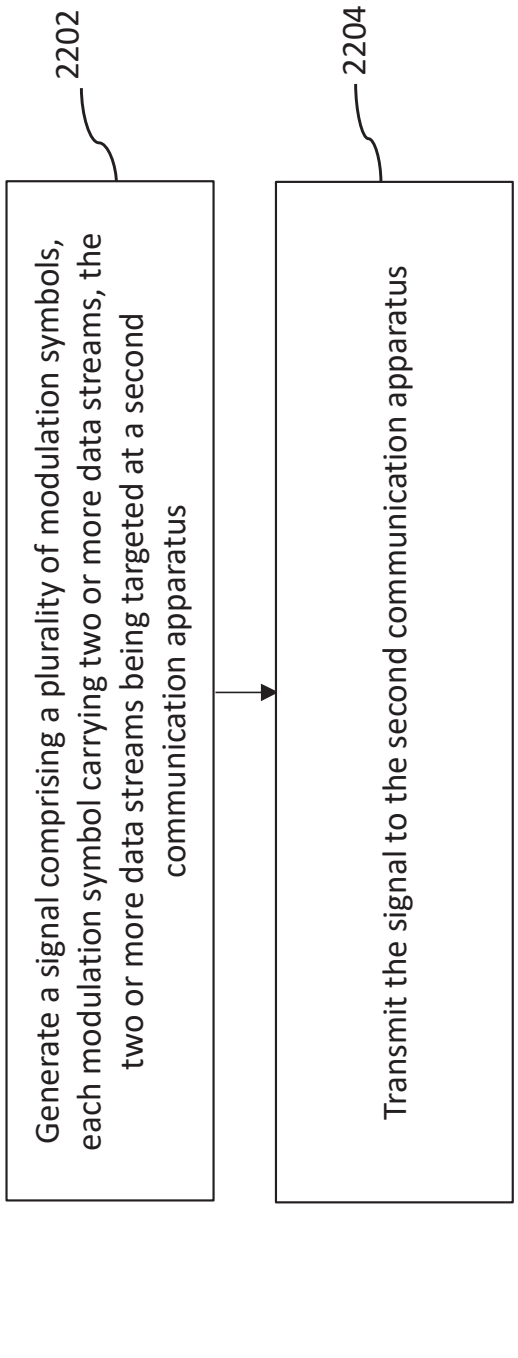

2202
Generate a signal comprising a plurality of modulation symbols, each modulation symbol carrying two or more data streams, the two or more data streams being targeted at a second communication apparatus
2204
Transmit the signal to the second communication apparatus
2200

Figure 22

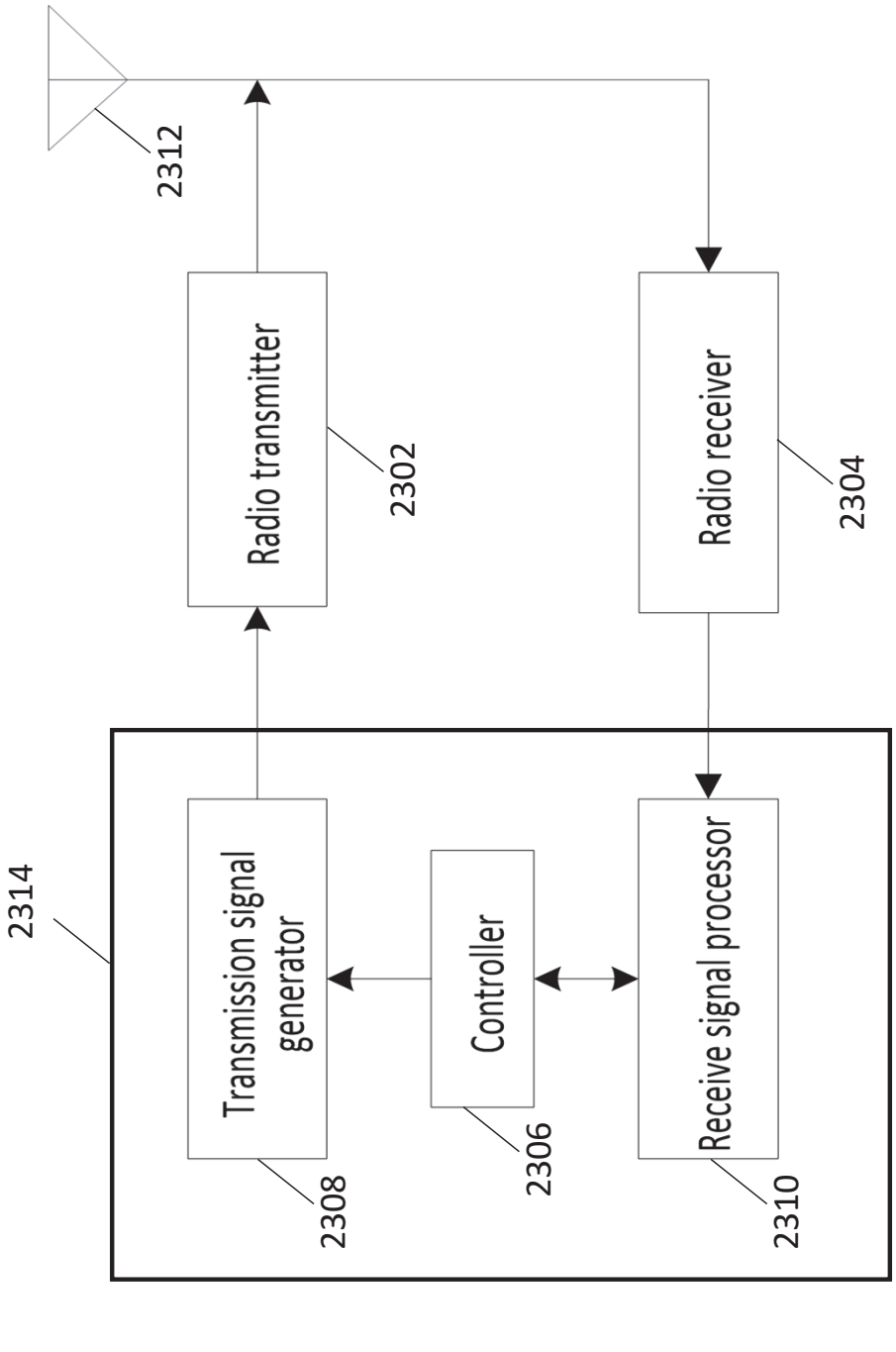

2312
Radio transmitter
2302
Radio receiver
2304
2314
Transmission signal generator
Controller
Receive signal processor
2308
2306
2310
2300

Figure 23