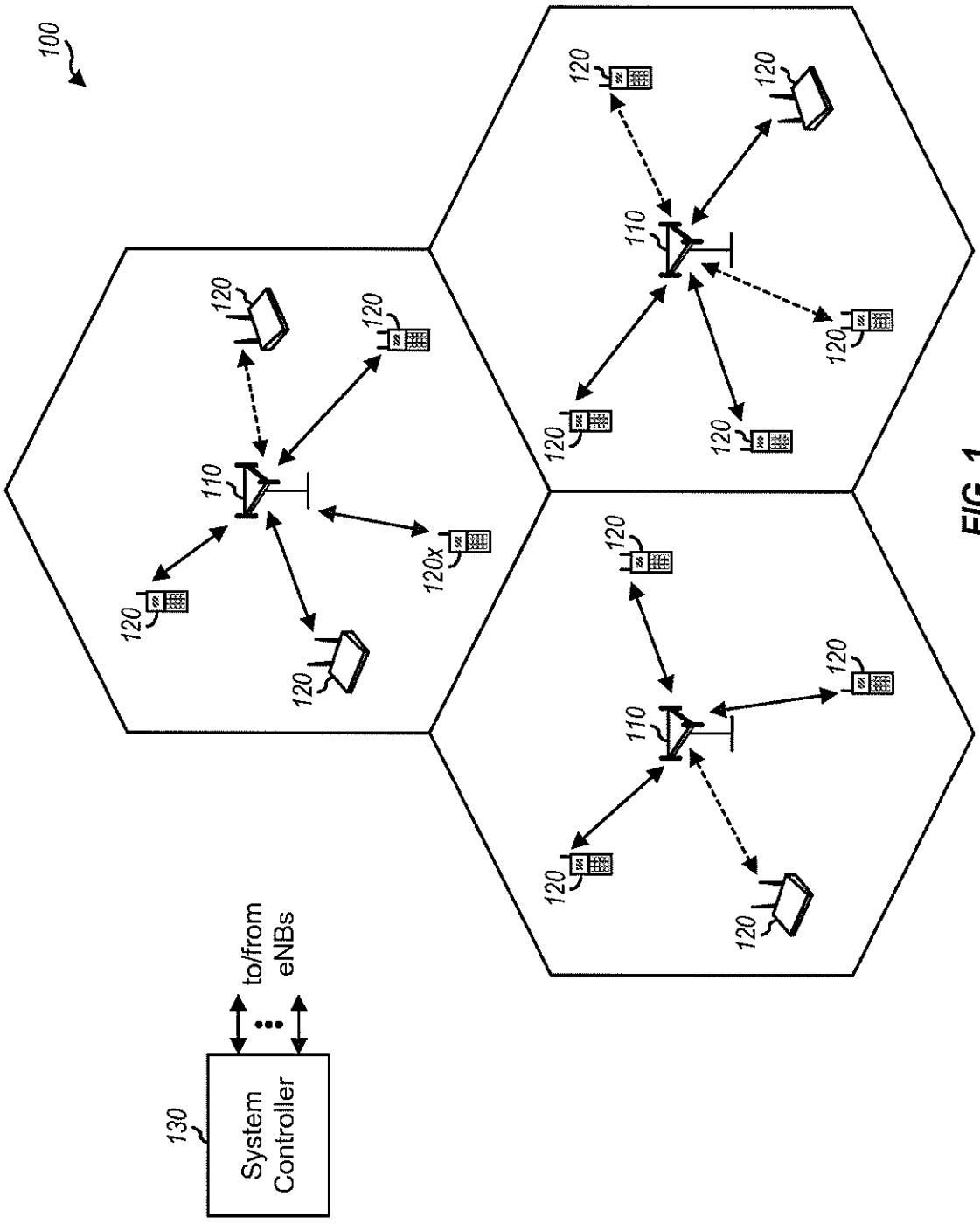


FIG. 1

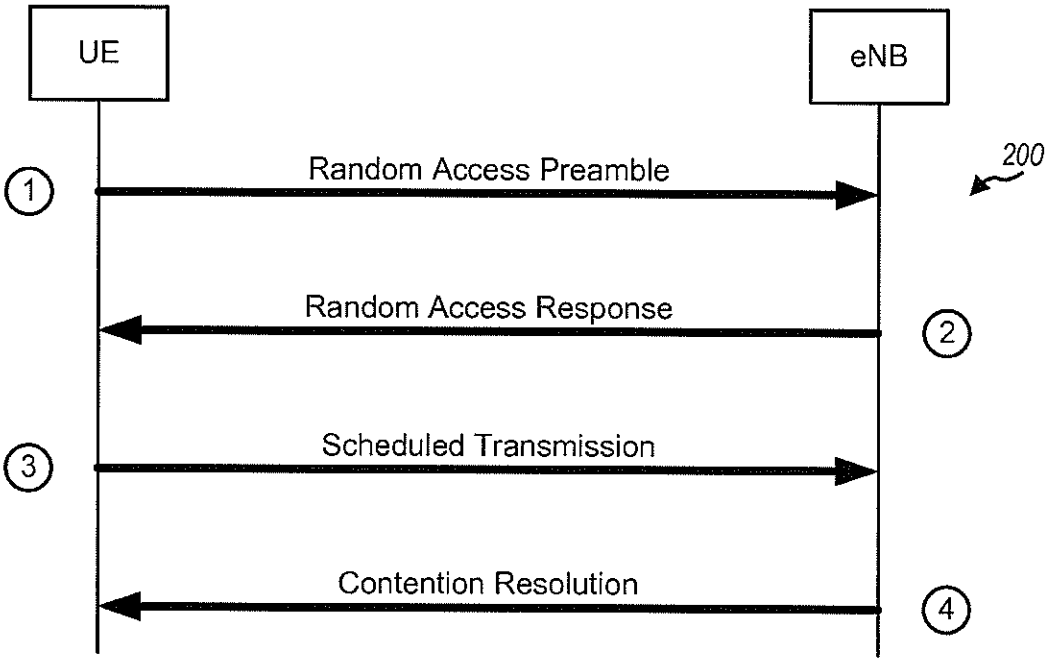

UE
eNB
200
1
Random Access Preamble
Random Access Response
2
3
Scheduled Transmission
Contention Resolution
4

FIG. 2

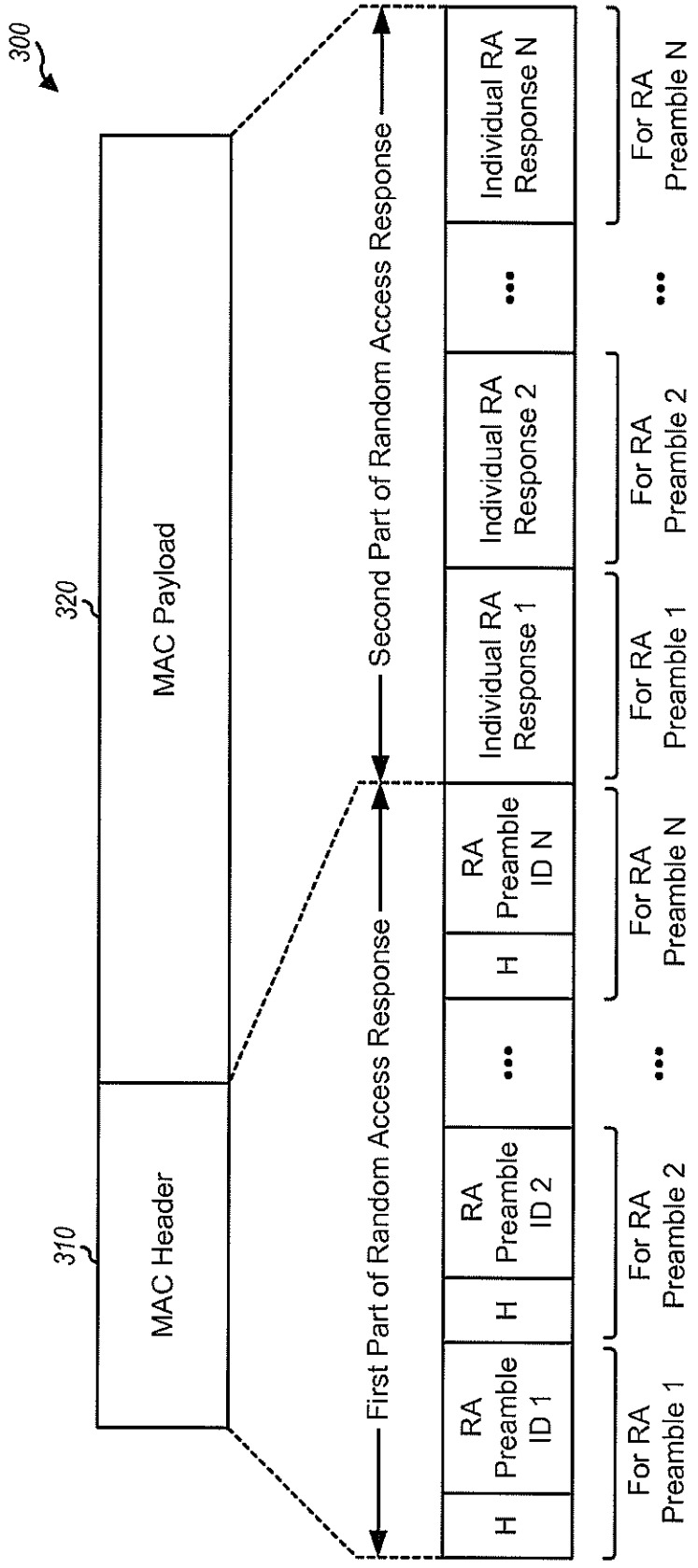

300
310
MAC Header
320
MAC Payload
First Part of Random Access Response
Second Part of Random Access Response
H
RA Preamble ID 1
H
RA Preamble ID 2
...
H
RA Preamble ID N
Individual RA Response 1
Individual RA Response 2
...
Individual RA Response N
For RA Preamble 1
For RA Preamble 2
For RA Preamble N
For RA Preamble 1
For RA Preamble 2
For RA Preamble N

FIG. 3

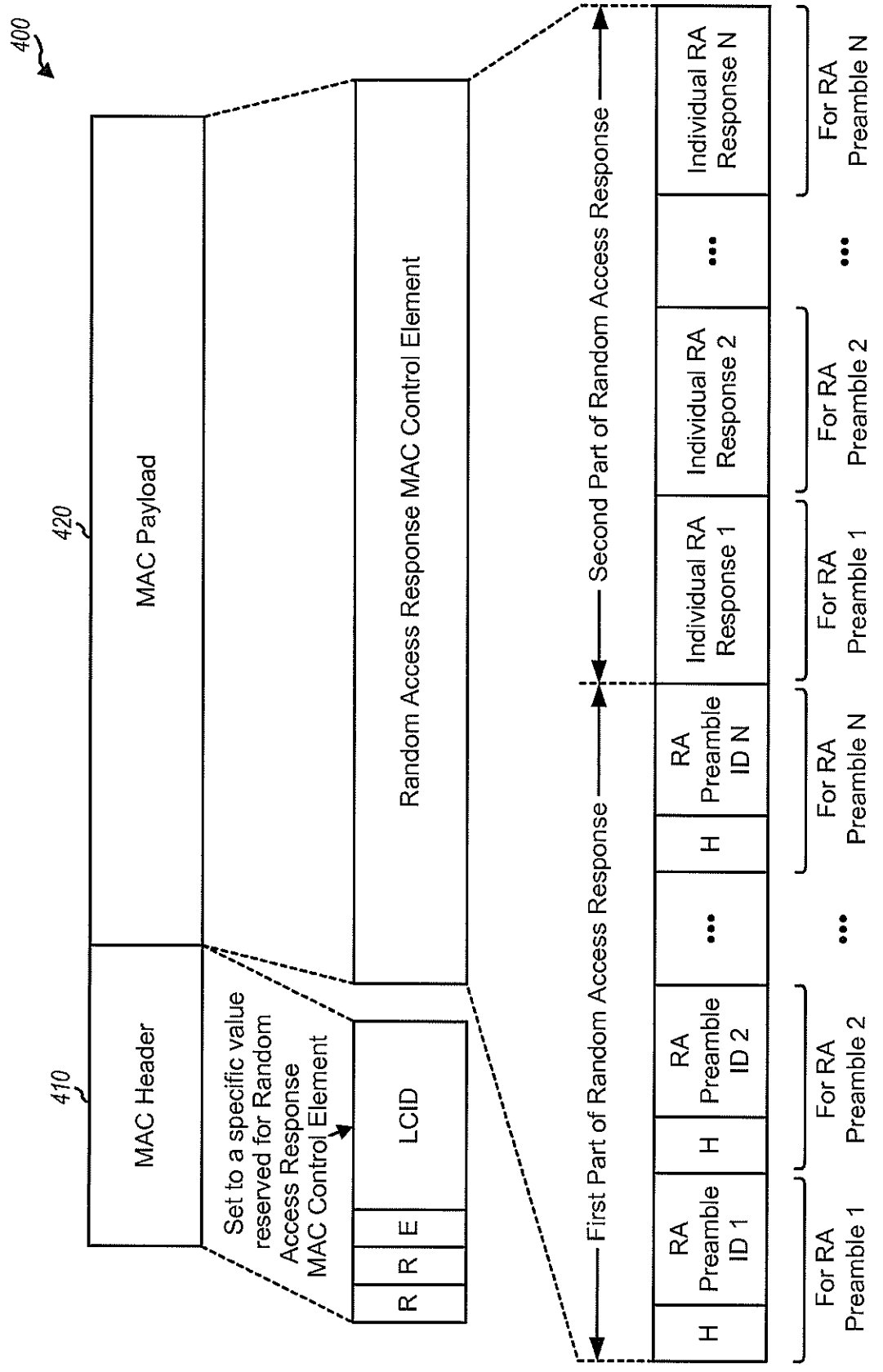

400
410
MAC Header
420
MAC Payload
Set to a specific value reserved for Random Access Response MAC Control Element
R
R
E
LCID
Random Access Response MAC Control Element
First Part of Random Access Response
Second Part of Random Access Response
H
RA Preamble ID 1
H
RA Preamble ID 2
...
H
RA Preamble ID N
Individual RA Response 1
Individual RA Response 2
...
Individual RA Response N
For RA Preamble 1
For RA Preamble 2
For RA Preamble N
For RA Preamble 1
For RA Preamble 2
For RA Preamble N

FIG. 4

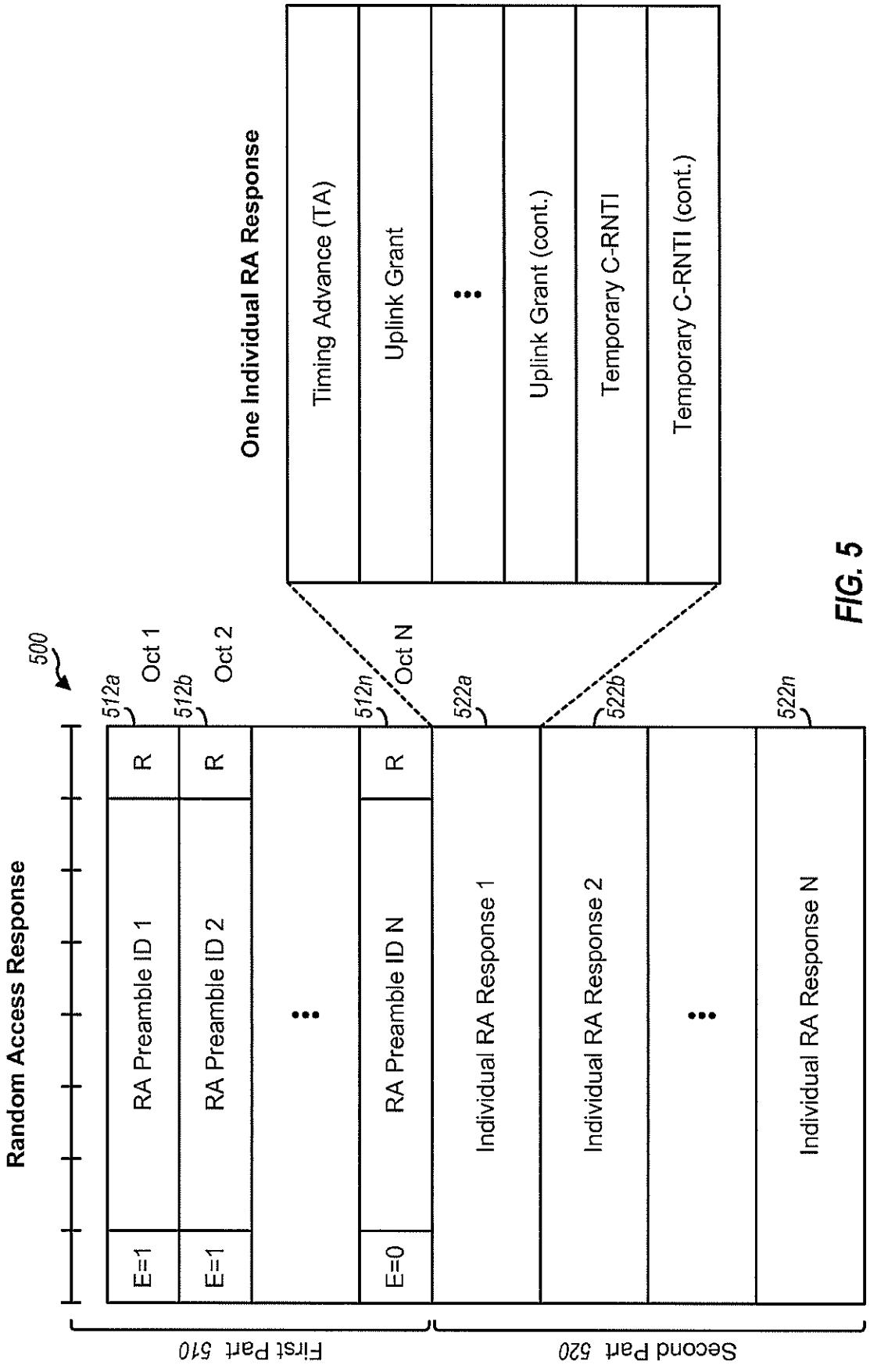

Random Access Response
500
512a
Oct 1
512b
Oct 2
512n
Oct N
E=1
E=1
E=0
R
R
R
RA Preamble ID 1
RA Preamble ID 2
RA Preamble ID N
First Part 510
522a
522b
522n
Individual RA Response 1
Individual RA Response 2
Individual RA Response N
Second Part 520
One Individual RA Response
Timing Advance (TA)
Uplink Grant
Uplink Grant (cont.)
Temporary C-RNTI
Temporary C-RNTI (cont.)

FIG. 5

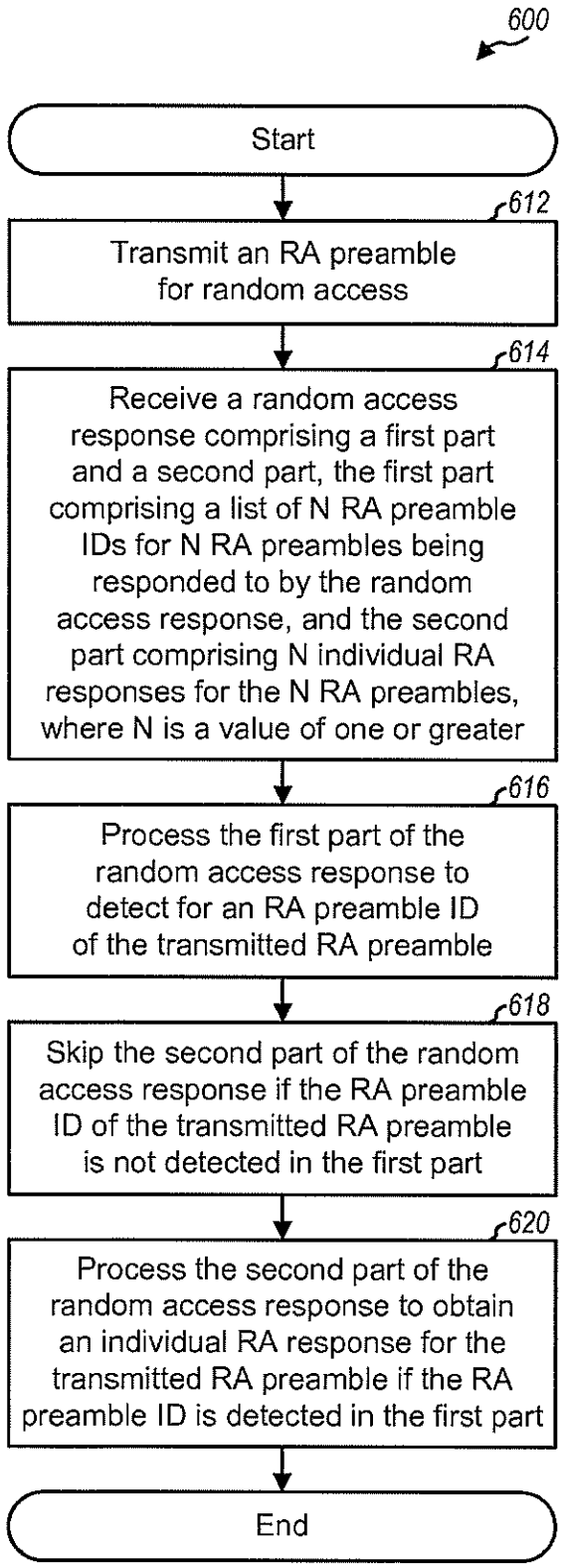

600
Start
612
Transmit an RA preamble for random access
614
Receive a random access response comprising a first part and a second part, the first part comprising a list of N RA preamble IDs for N RA preambles being responded to by the random access response, and the second part comprising N individual RA responses for the N RA preambles, where N is a value of one or greater
616
Process the first part of the random access response to detect for an RA preamble ID of the transmitted RA preamble
618
Skip the second part of the random access response if the RA preamble ID of the transmitted RA preamble is not detected in the first part
620
Process the second part of the random access response to obtain an individual RA response for the transmitted RA preamble if the RA preamble ID is detected in the first part
End

FIG. 6

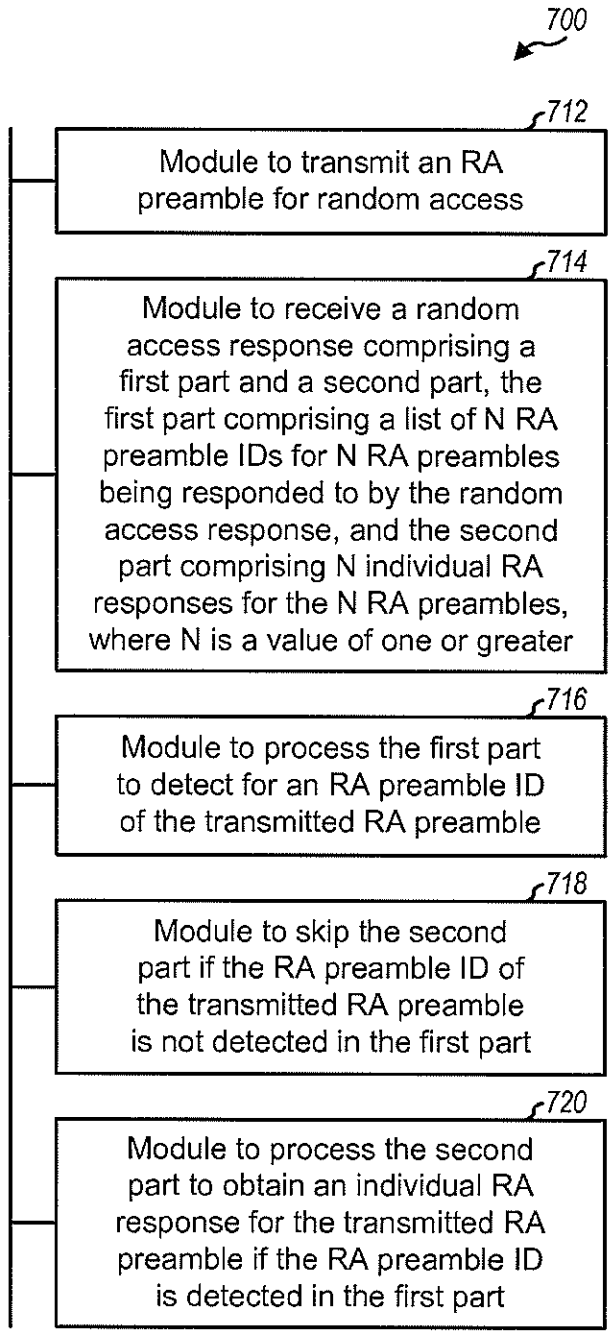

700
712
Module to transmit an RA preamble for random access
714
Module to receive a random access response comprising a first part and a second part, the first part comprising a list of N RA preamble IDs for N RA preambles being responded to by the random access response, and the second part comprising N individual RA responses for the N RA preambles, where N is a value of one or greater
716
Module to process the first part to detect for an RA preamble ID of the transmitted RA preamble
718
Module to skip the second part if the RA preamble ID of the transmitted RA preamble is not detected in the first part
720
Module to process the second part to obtain an individual RA response for the transmitted RA preamble if the RA preamble ID is detected in the first part

FIG. 7

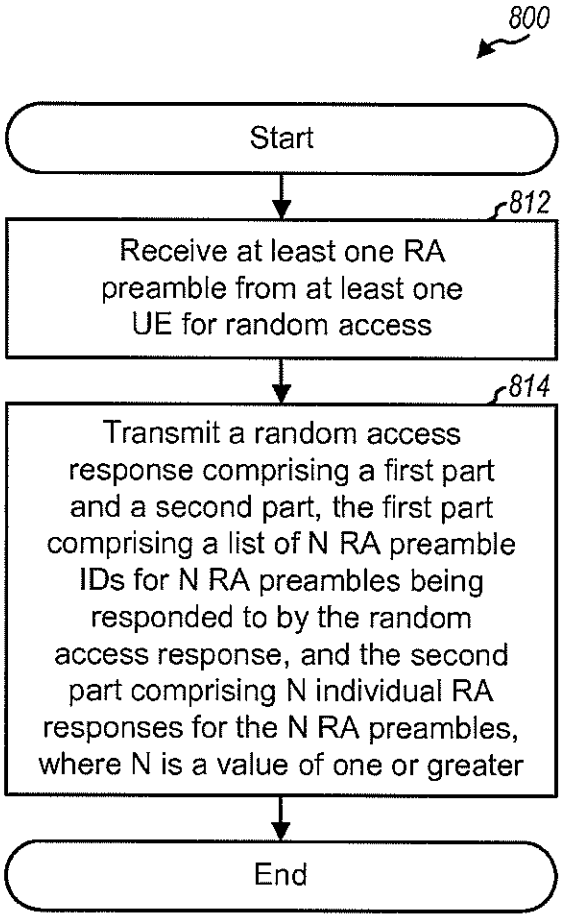

800
Start
812
Receive at least one RA preamble from at least one UE for random access
814
Transmit a random access response comprising a first part and a second part, the first part comprising a list of N RA preamble IDs for N RA preambles being responded to by the random access response, and the second part comprising N individual RA responses for the N RA preambles, where N is a value of one or greater
End

FIG. 8

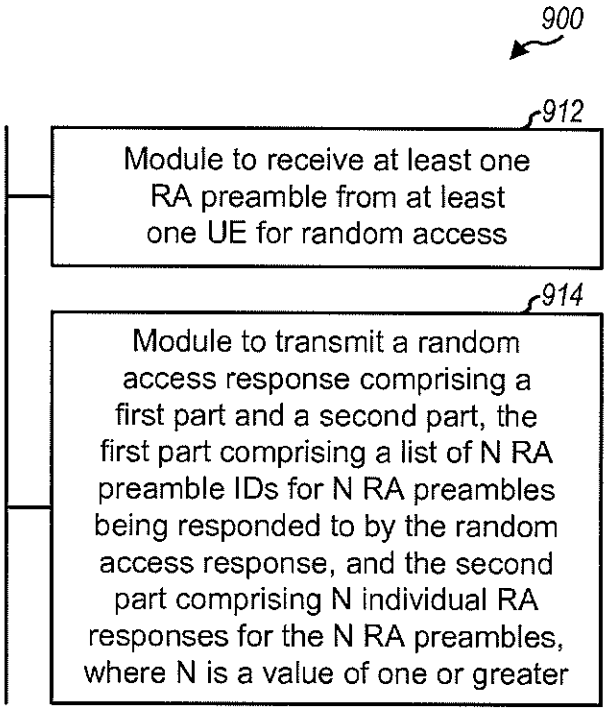

900
912
Module to receive at least one RA preamble from at least one UE for random access
914
Module to transmit a random access response comprising a first part and a second part, the first part comprising a list of N RA preamble IDs for N RA preambles being responded to by the random access response, and the second part comprising N individual RA responses for the N RA preambles, where N is a value of one or greater

FIG. 9

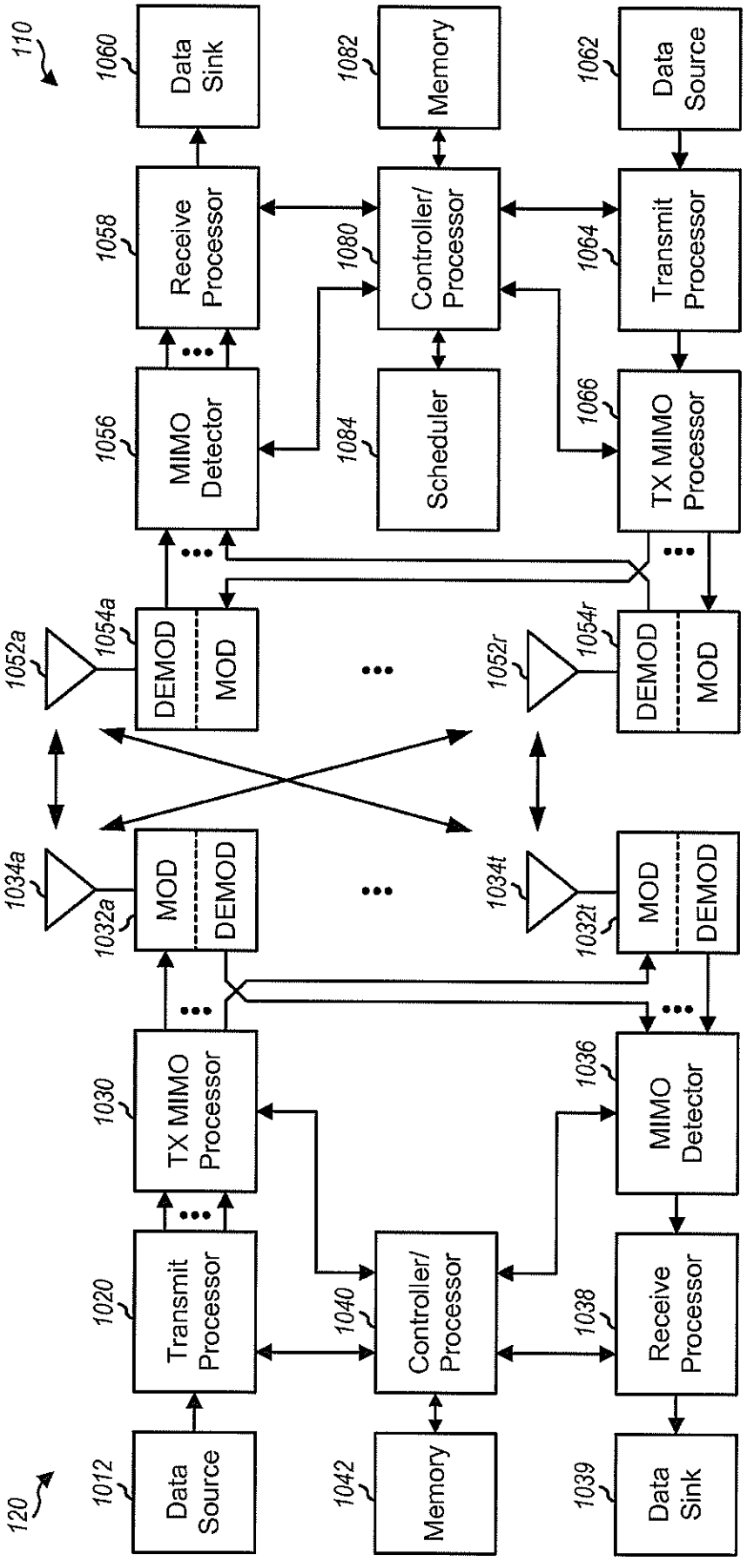

110
1060
Data Sink
1082
Memory
1062
Data Source
1058
Receive Processor
1080
Controller/ Processor
1064
Transmit Processor
1056
MIMO Detector
1084
Scheduler
1066
TX MIMO Processor
1052a
1054a
DEMOD
MOD
1052r
1054r
DEMOD
MOD
1034a
1032a
MOD
DEMOD
1034t
1032t
MOD
DEMOD
1030
TX MIMO Processor
1036
MIMO Detector
1020
Transmit Processor
1040
Controller/ Processor
1038
Receive Processor
120
1012
Data Source
1042
Memory
1039
Data Sink

FIG. 10