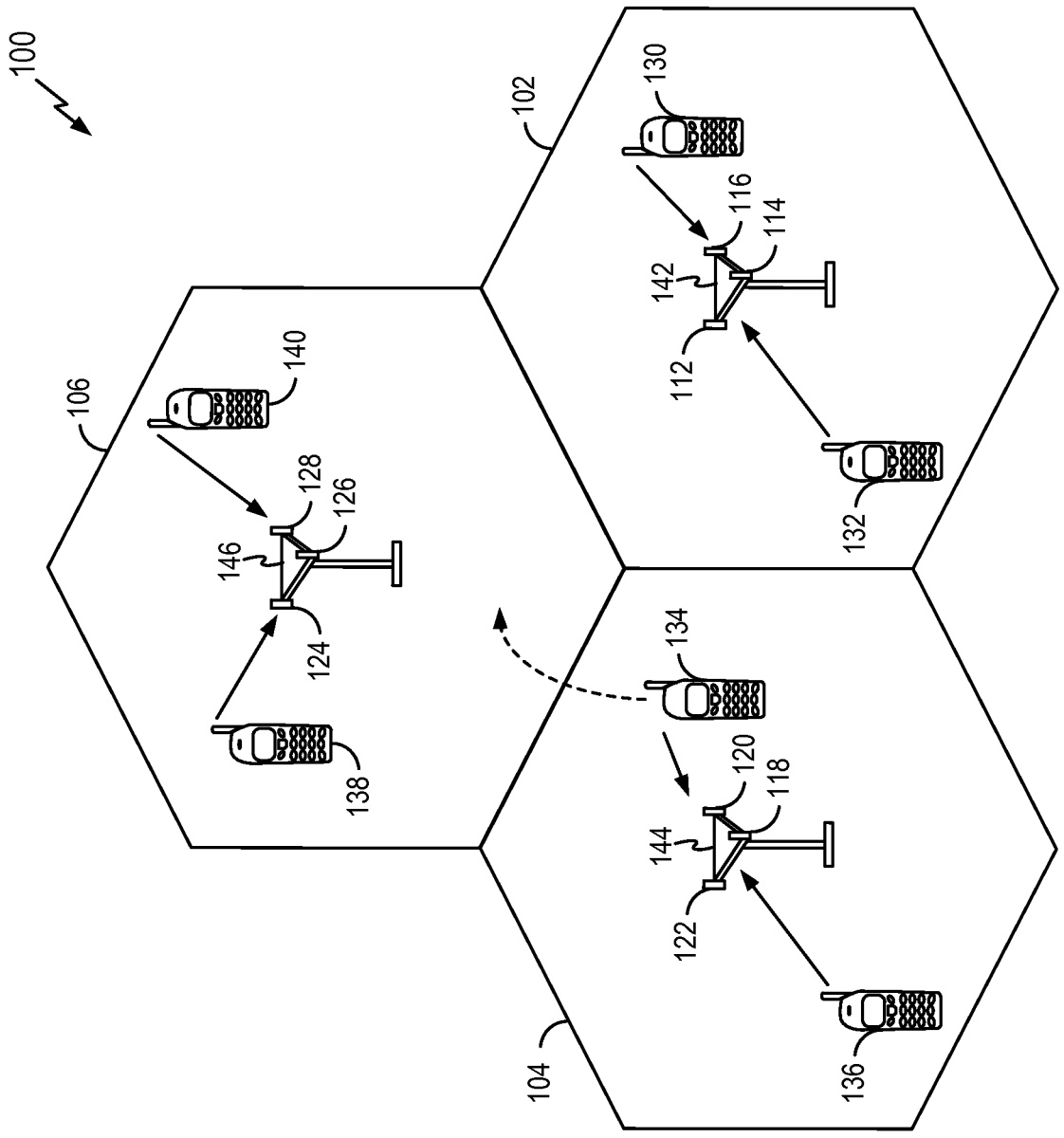
100
102
104
106
112
114
116
120
118
122
124
126
128
130
132
134
136
138
140
142
144
146

FIG. 1

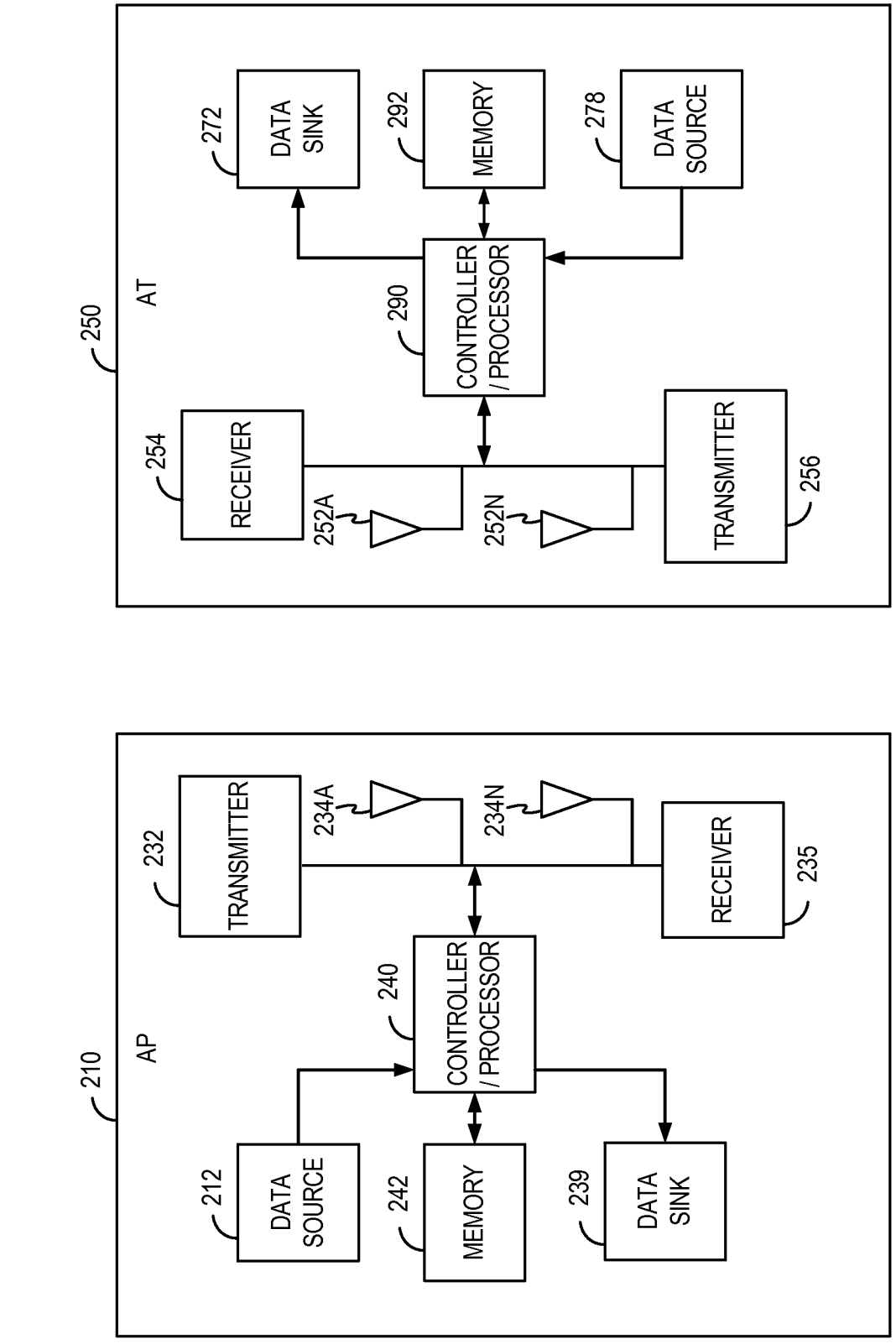
200
210
AP
TRANSMITTER
232
234A
234N
RECEIVER
235
CONTROLLER / PROCESSOR
240
DATA SOURCE
212
MEMORY
242
DATA SINK
239
250
AT
DATA SINK
272
MEMORY
292
DATA SOURCE
278
CONTROLLER / PROCESSOR
290
RECEIVER
254
252A
252N
TRANSMITTER
256

FIG. 2

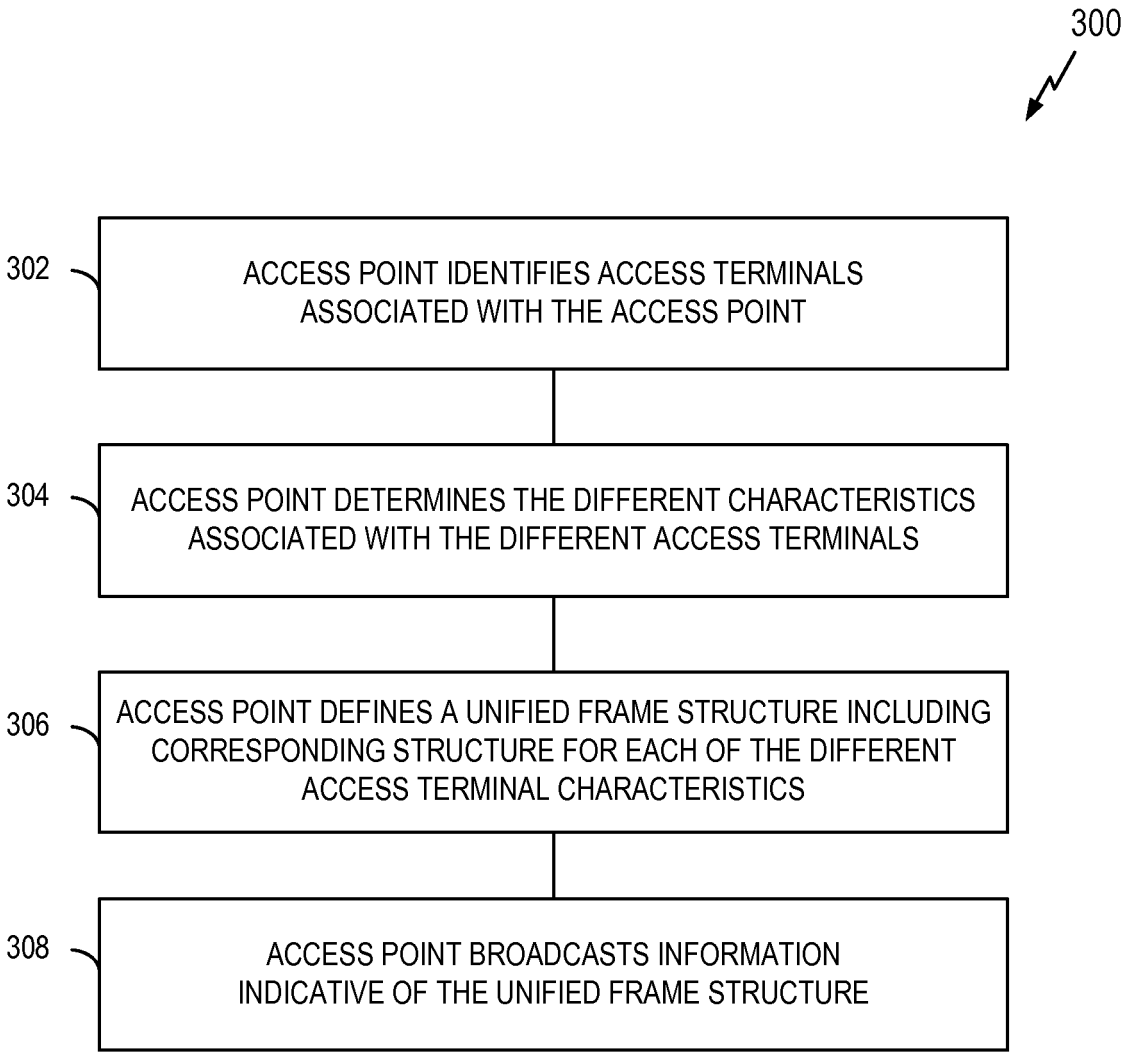
300
302
ACCESS POINT IDENTIFIES ACCESS TERMINALS ASSOCIATED WITH THE ACCESS POINT
304
ACCESS POINT DETERMINES THE DIFFERENT CHARACTERISTICS ASSOCIATED WITH THE DIFFERENT ACCESS TERMINALS
306
ACCESS POINT DEFINES A UNIFIED FRAME STRUCTURE INCLUDING CORRESPONDING STRUCTURE FOR EACH OF THE DIFFERENT ACCESS TERMINAL CHARACTERISTICS
308
ACCESS POINT BROADCASTS INFORMATION INDICATIVE OF THE UNIFIED FRAME STRUCTURE

FIG. 3

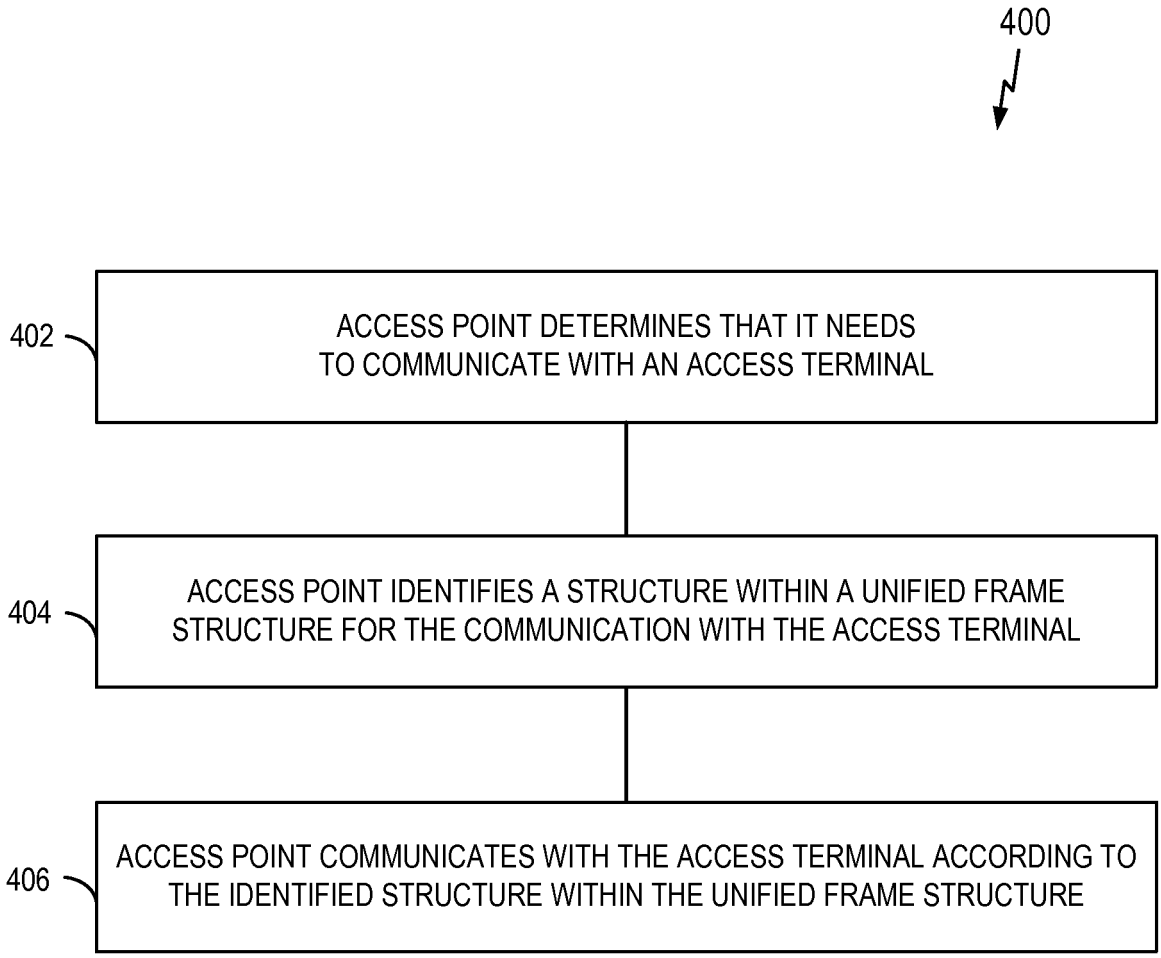
400
402
ACCESS POINT DETERMINES THAT IT NEEDS TO COMMUNICATE WITH AN ACCESS TERMINAL
404
ACCESS POINT IDENTIFIES A STRUCTURE WITHIN A UNIFIED FRAME STRUCTURE FOR THE COMMUNICATION WITH THE ACCESS TERMINAL
406
ACCESS POINT COMMUNICATES WITH THE ACCESS TERMINAL ACCORDING TO THE IDENTIFIED STRUCTURE WITHIN THE UNIFIED FRAME STRUCTURE

FIG. 4

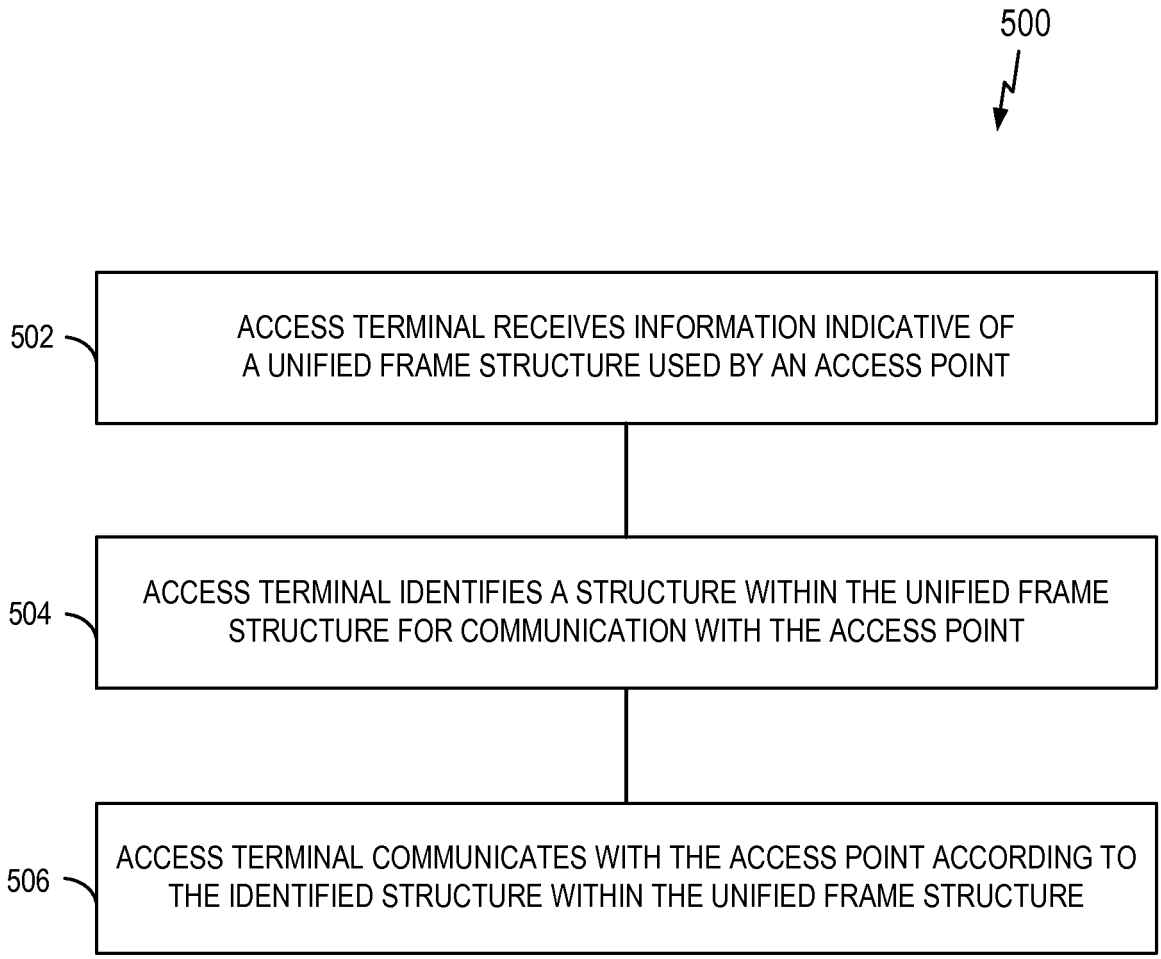
500
502
ACCESS TERMINAL RECEIVES INFORMATION INDICATIVE OF A UNIFIED FRAME STRUCTURE USED BY AN ACCESS POINT
504
ACCESS TERMINAL IDENTIFIES A STRUCTURE WITHIN THE UNIFIED FRAME STRUCTURE FOR COMMUNICATION WITH THE ACCESS POINT
506
ACCESS TERMINAL COMMUNICATES WITH THE ACCESS POINT ACCORDING TO THE IDENTIFIED STRUCTURE WITHIN THE UNIFIED FRAME STRUCTURE

FIG. 5

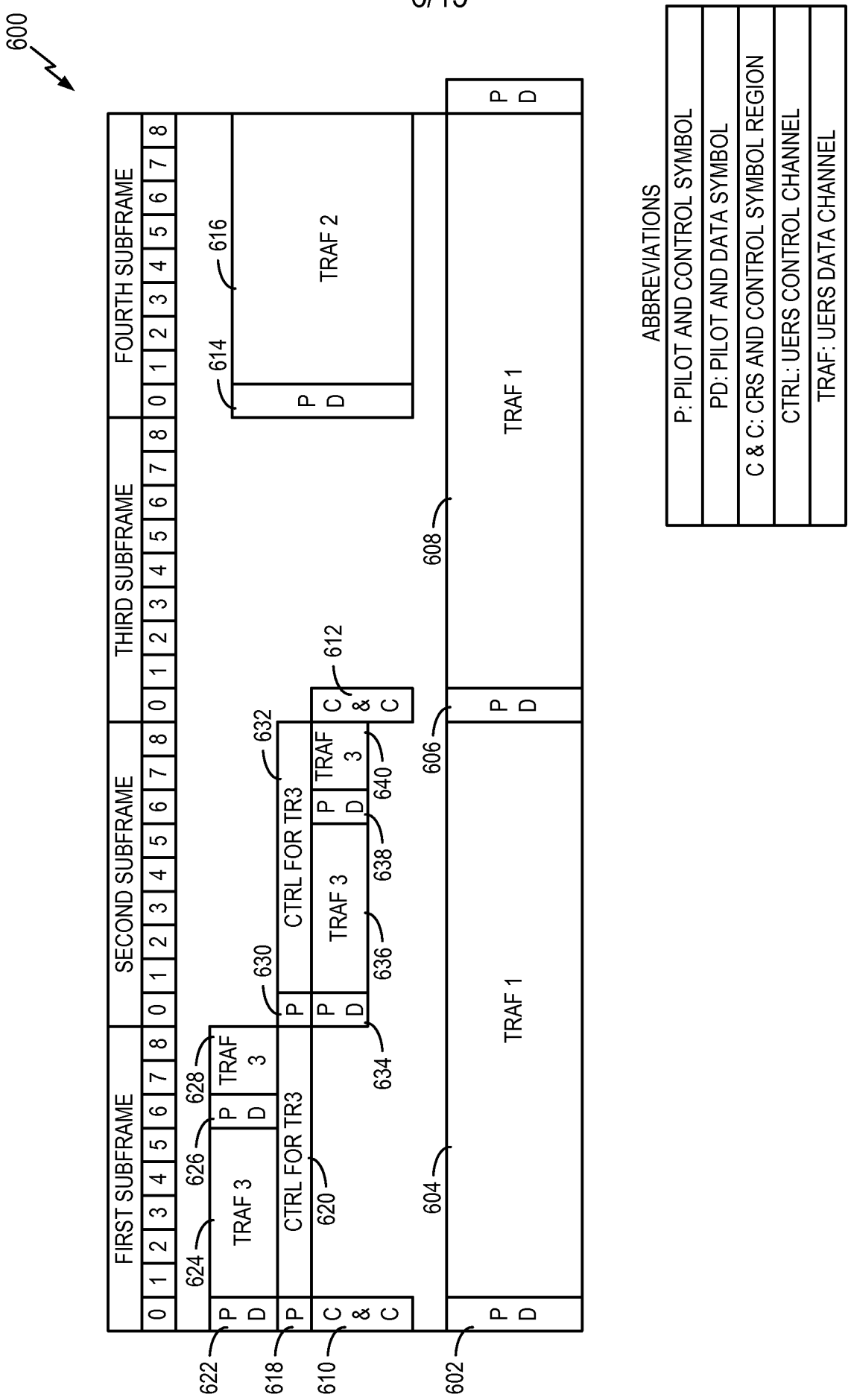
600
FIRST SUBFRAME
SECOND SUBFRAME
THIRD SUBFRAME
FOURTH SUBFRAME
0 1 2 3 4 5 6 7 8
P D
C & C
TRAF 3
CTRL FOR TR3
TRAF 1
TRAF 2
602
604
606
608
610
612
614
616
618
620
622
624
626
628
630
632
634
636
638
640
ABBREVIATIONS
P: PILOT AND CONTROL SYMBOL
PD: PILOT AND DATA SYMBOL
C & C: CRS AND CONTROL SYMBOL REGION
CTRL: UERS CONTROL CHANNEL
TRAF: UERS DATA CHANNEL

FIG. 6

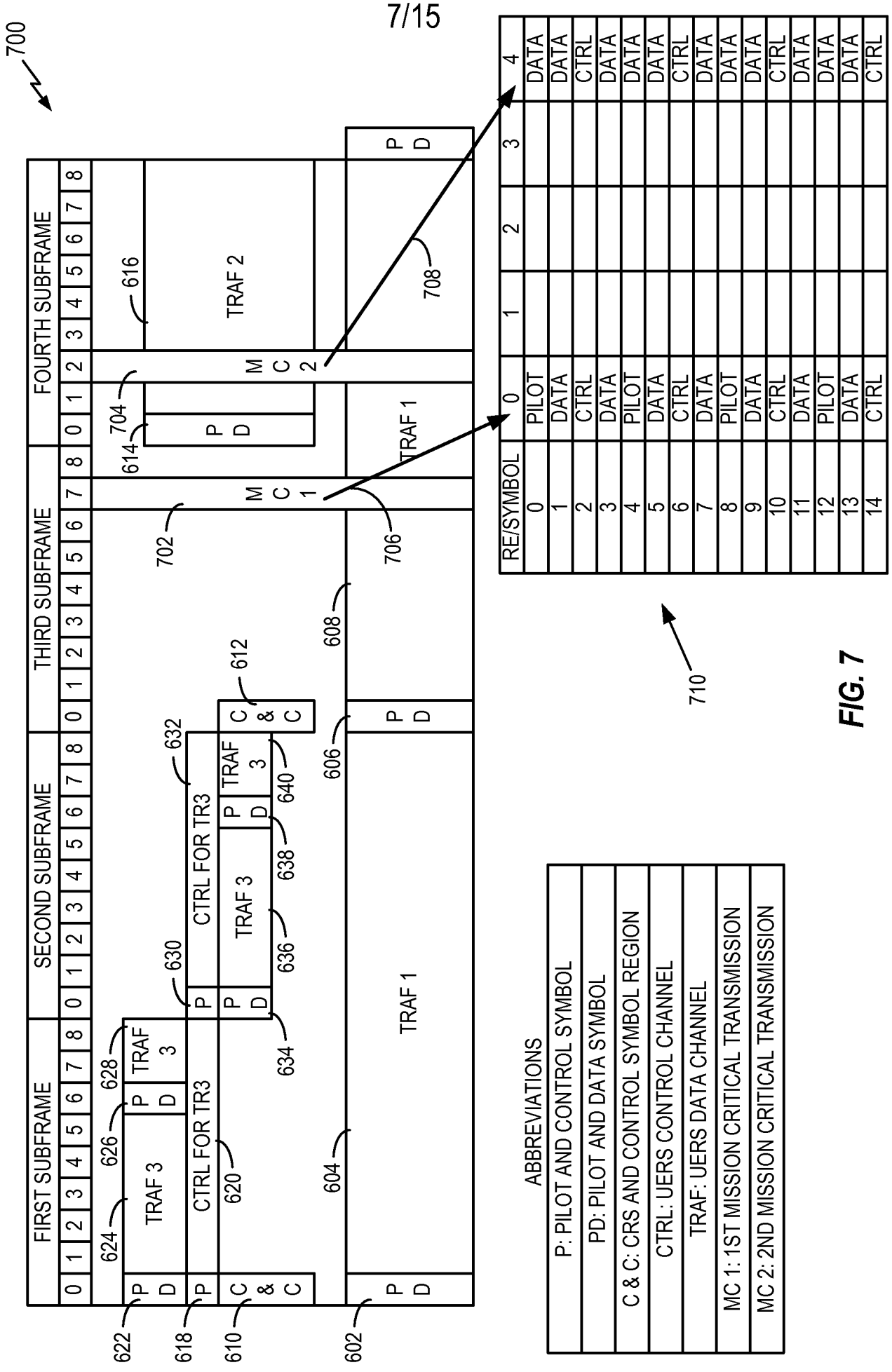
700
FIRST SUBFRAME
SECOND SUBFRAME
THIRD SUBFRAME
FOURTH SUBFRAME
0 1 2 3 4 5 6 7 8
TRAF 3
CTRL FOR TR3
TRAF 3
TRAF 1
TRAF 2
P
D
C & C
MC 1
MC 2
602
604
606
608
610
612
614
616
618
620
622
624
626
628
630
632
634
636
638
640
702
704
706
708
710
RE/SYMBOL
PILOT
DATA
CTRL
ABBREVIATIONS
P: PILOT AND CONTROL SYMBOL
PD: PILOT AND DATA SYMBOL
C & C: CRS AND CONTROL SYMBOL REGION
CTRL: UERS CONTROL CHANNEL
TRAF: UERS DATA CHANNEL
MC 1: 1ST MISSION CRITICAL TRANSMISSION
MC 2: 2ND MISSION CRITICAL TRANSMISSION

FIG. 7

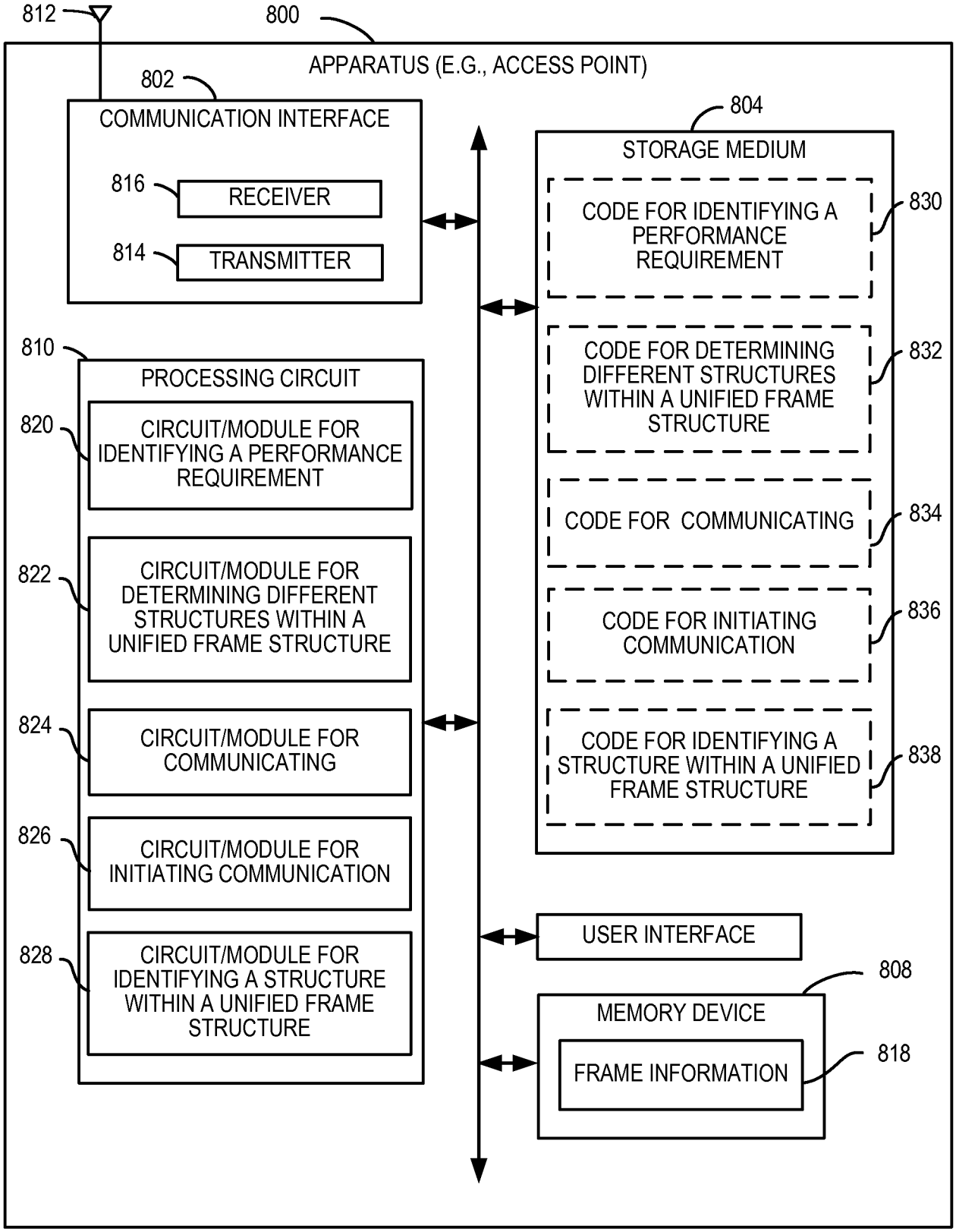
812
800
APPARATUS (E.G., ACCESS POINT)
802
COMMUNICATION INTERFACE
816
RECEIVER
814
TRANSMITTER
804
STORAGE MEDIUM
CODE FOR IDENTIFYING A PERFORMANCE REQUIREMENT
830
CODE FOR DETERMINING DIFFERENT STRUCTURES WITHIN A UNIFIED FRAME STRUCTURE
832
CODE FOR COMMUNICATING
834
CODE FOR INITIATING COMMUNICATION
836
CODE FOR IDENTIFYING A STRUCTURE WITHIN A UNIFIED FRAME STRUCTURE
838
810
PROCESSING CIRCUIT
820
CIRCUIT/MODULE FOR IDENTIFYING A PERFORMANCE REQUIREMENT
822
CIRCUIT/MODULE FOR DETERMINING DIFFERENT STRUCTURES WITHIN A UNIFIED FRAME STRUCTURE
824
CIRCUIT/MODULE FOR COMMUNICATING
826
CIRCUIT/MODULE FOR INITIATING COMMUNICATION
828
CIRCUIT/MODULE FOR IDENTIFYING A STRUCTURE WITHIN A UNIFIED FRAME STRUCTURE
USER INTERFACE
808
MEMORY DEVICE
FRAME INFORMATION
818

FIG. 8

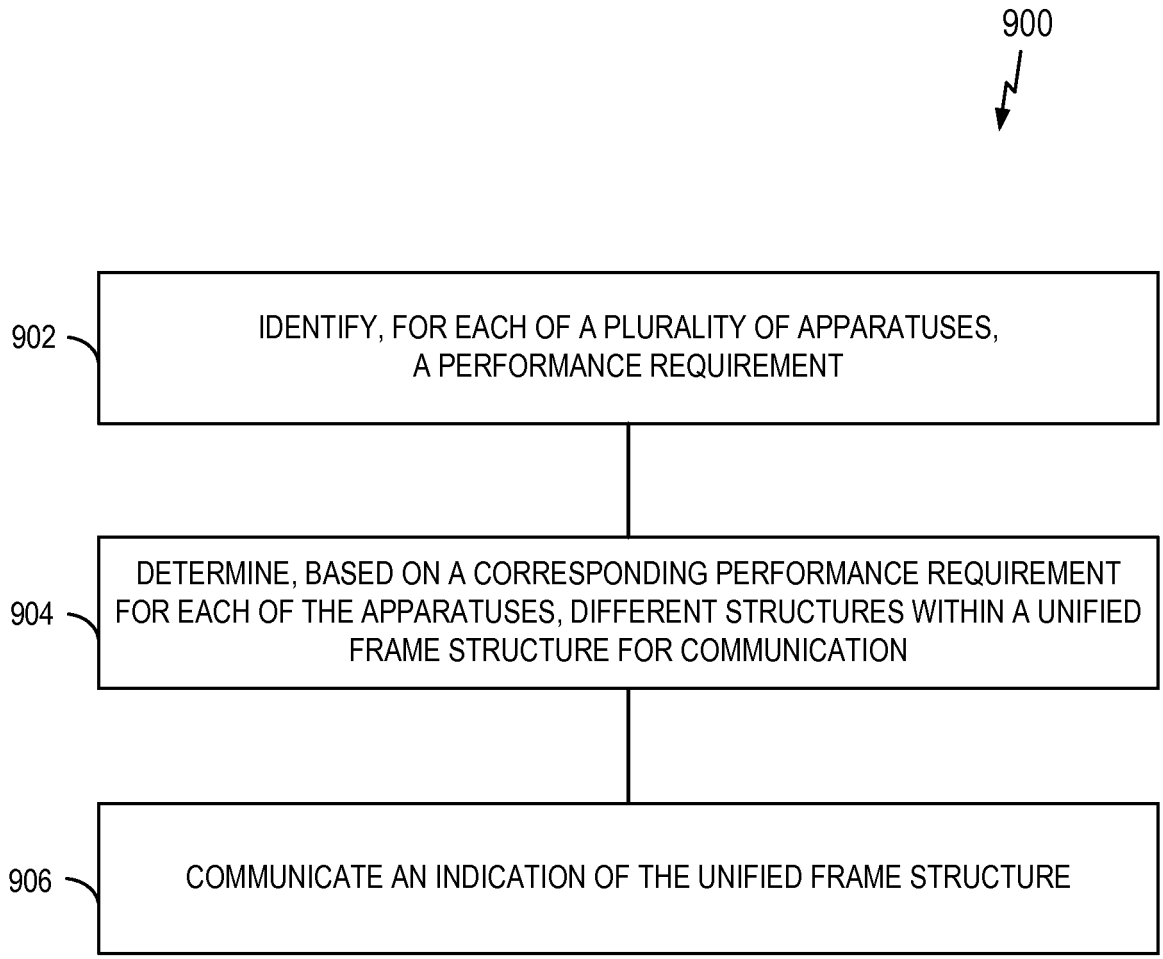
900
902
IDENTIFY, FOR EACH OF A PLURALITY OF APPARATUSES, A PERFORMANCE REQUIREMENT
904
DETERMINE, BASED ON A CORRESPONDING PERFORMANCE REQUIREMENT FOR EACH OF THE APPARATUSES, DIFFERENT STRUCTURES WITHIN A UNIFIED FRAME STRUCTURE FOR COMMUNICATION
906
COMMUNICATE AN INDICATION OF THE UNIFIED FRAME STRUCTURE

FIG. 9

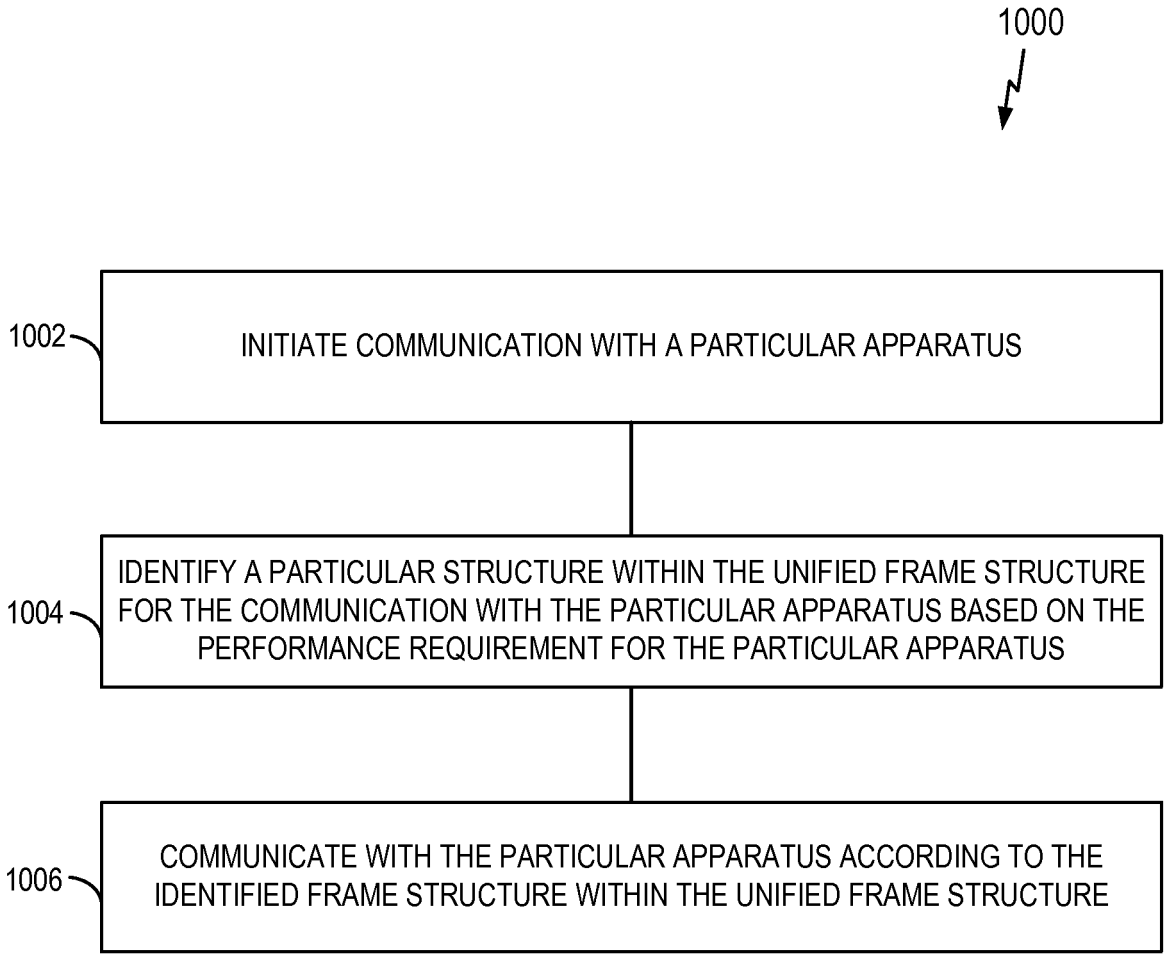
1000
1002
INITIATE COMMUNICATION WITH A PARTICULAR APPARATUS
1004
IDENTIFY A PARTICULAR STRUCTURE WITHIN THE UNIFIED FRAME STRUCTURE FOR THE COMMUNICATION WITH THE PARTICULAR APPARATUS BASED ON THE PERFORMANCE REQUIREMENT FOR THE PARTICULAR APPARATUS
1006
COMMUNICATE WITH THE PARTICULAR APPARATUS ACCORDING TO THE IDENTIFIED FRAME STRUCTURE WITHIN THE UNIFIED FRAME STRUCTURE

FIG. 10

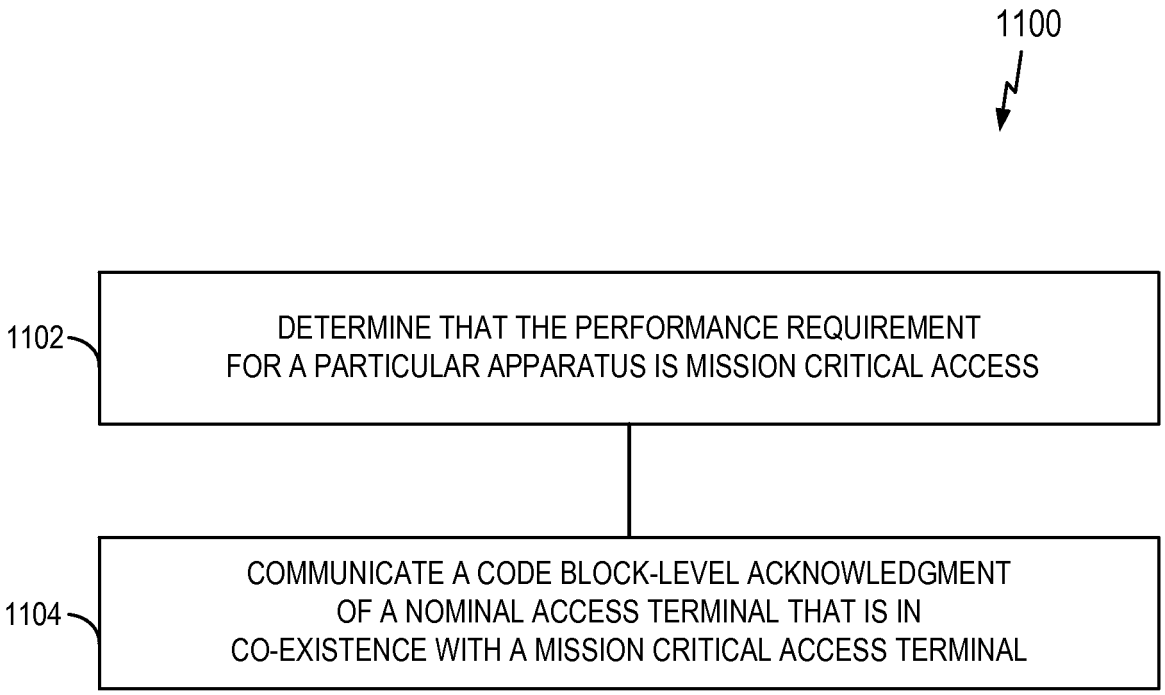
1100
1102
DETERMINE THAT THE PERFORMANCE REQUIREMENT FOR A PARTICULAR APPARATUS IS MISSION CRITICAL ACCESS
1104
COMMUNICATE A CODE BLOCK-LEVEL ACKNOWLEDGMENT OF A NOMINAL ACCESS TERMINAL THAT IS IN CO-EXISTENCE WITH A MISSION CRITICAL ACCESS TERMINAL

FIG. 11

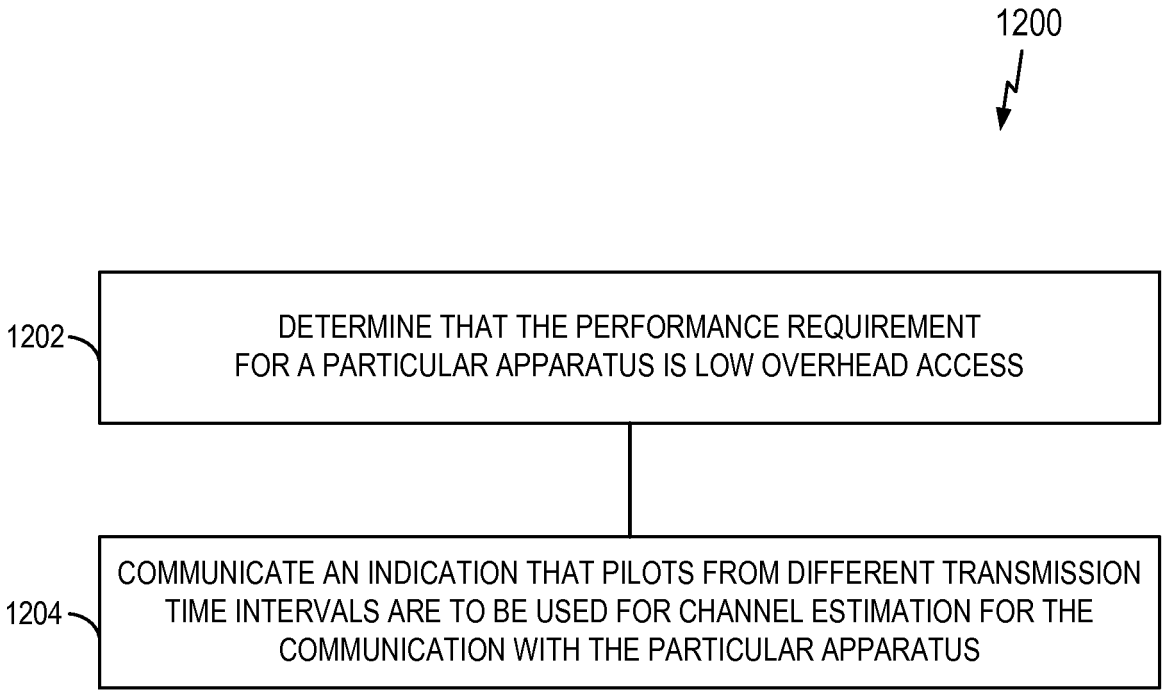
1200
1202
DETERMINE THAT THE PERFORMANCE REQUIREMENT FOR A PARTICULAR APPARATUS IS LOW OVERHEAD ACCESS
1204
COMMUNICATE AN INDICATION THAT PILOTS FROM DIFFERENT TRANSMISSION TIME INTERVALS ARE TO BE USED FOR CHANNEL ESTIMATION FOR THE COMMUNICATION WITH THE PARTICULAR APPARATUS

FIG. 12

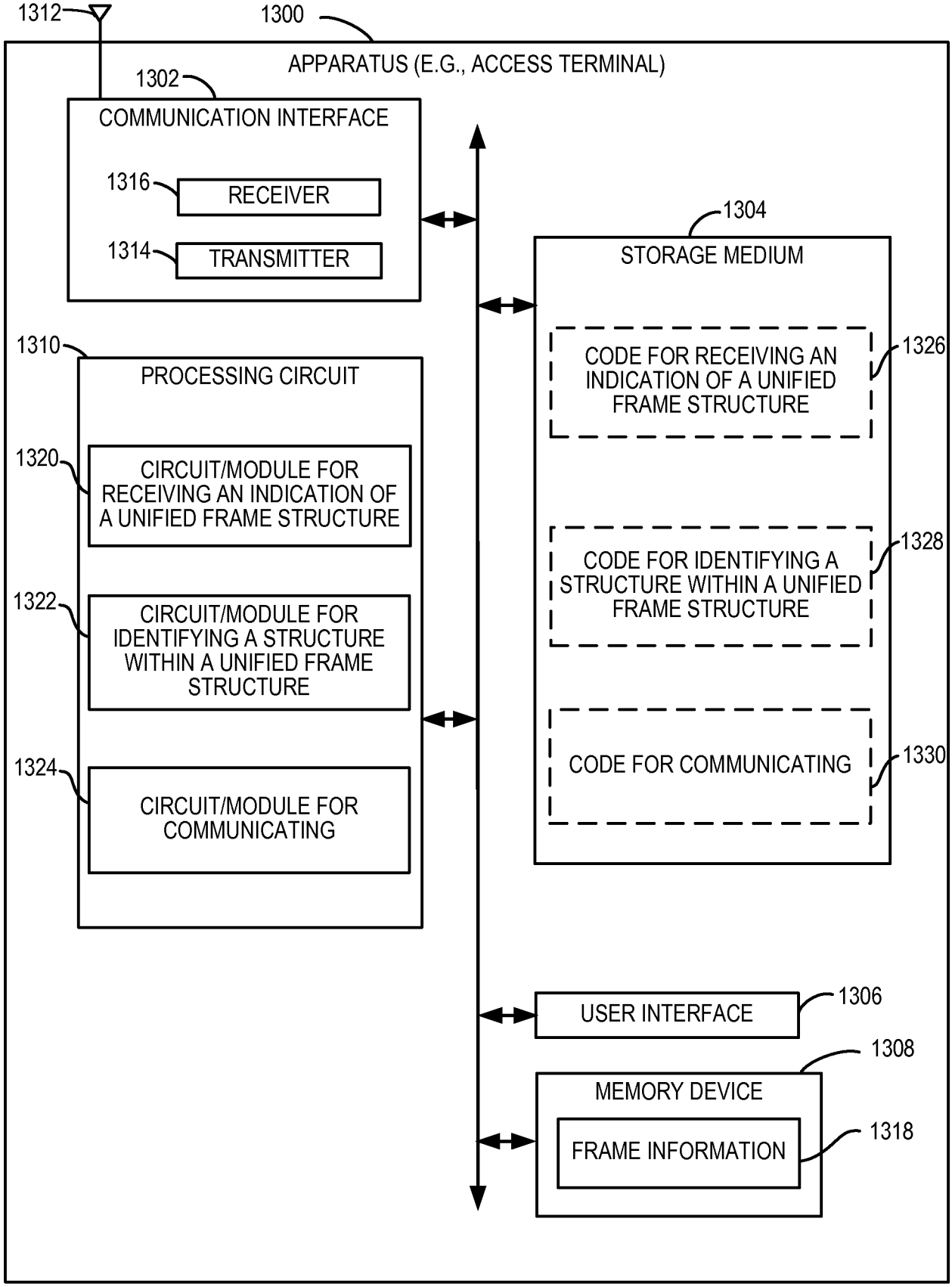
1312
1300
APPARATUS (E.G., ACCESS TERMINAL)
1302
COMMUNICATION INTERFACE
1316
RECEIVER
1314
TRANSMITTER
1304
STORAGE MEDIUM
1310
PROCESSING CIRCUIT
CODE FOR RECEIVING AN INDICATION OF A UNIFIED FRAME STRUCTURE
1326
1320
CIRCUIT/MODULE FOR RECEIVING AN INDICATION OF A UNIFIED FRAME STRUCTURE
CODE FOR IDENTIFYING A STRUCTURE WITHIN A UNIFIED FRAME STRUCTURE
1328
1322
CIRCUIT/MODULE FOR IDENTIFYING A STRUCTURE WITHIN A UNIFIED FRAME STRUCTURE
CODE FOR COMMUNICATING
1330
1324
CIRCUIT/MODULE FOR COMMUNICATING
USER INTERFACE
1306
1308
MEMORY DEVICE
FRAME INFORMATION
1318

FIG. 13

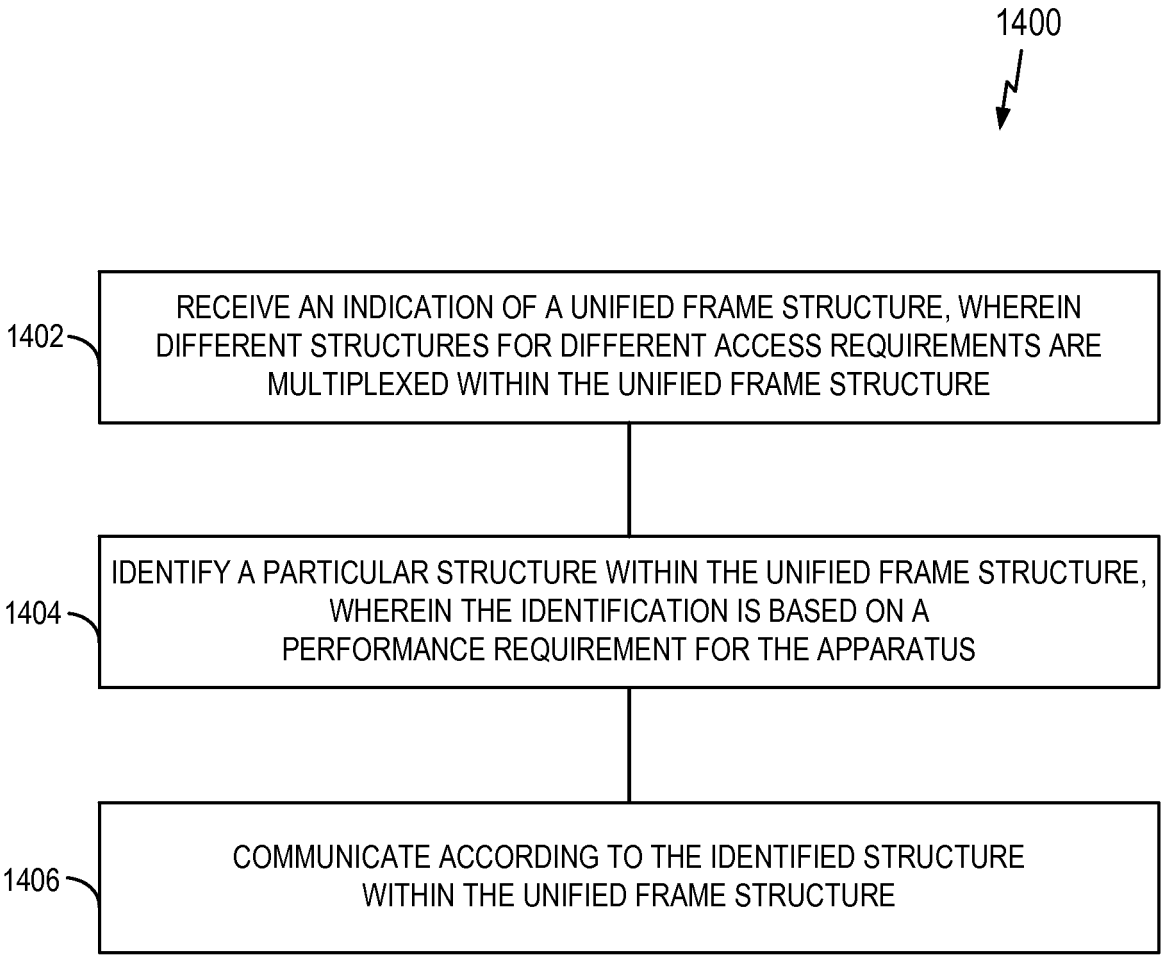
1400
1402
RECEIVE AN INDICATION OF A UNIFIED FRAME STRUCTURE, WHEREIN DIFFERENT STRUCTURES FOR DIFFERENT ACCESS REQUIREMENTS ARE MULTIPLEXED WITHIN THE UNIFIED FRAME STRUCTURE
1404
IDENTIFY A PARTICULAR STRUCTURE WITHIN THE UNIFIED FRAME STRUCTURE, WHEREIN THE IDENTIFICATION IS BASED ON A PERFORMANCE REQUIREMENT FOR THE APPARATUS
1406
COMMUNICATE ACCORDING TO THE IDENTIFIED STRUCTURE WITHIN THE UNIFIED FRAME STRUCTURE

FIG. 14

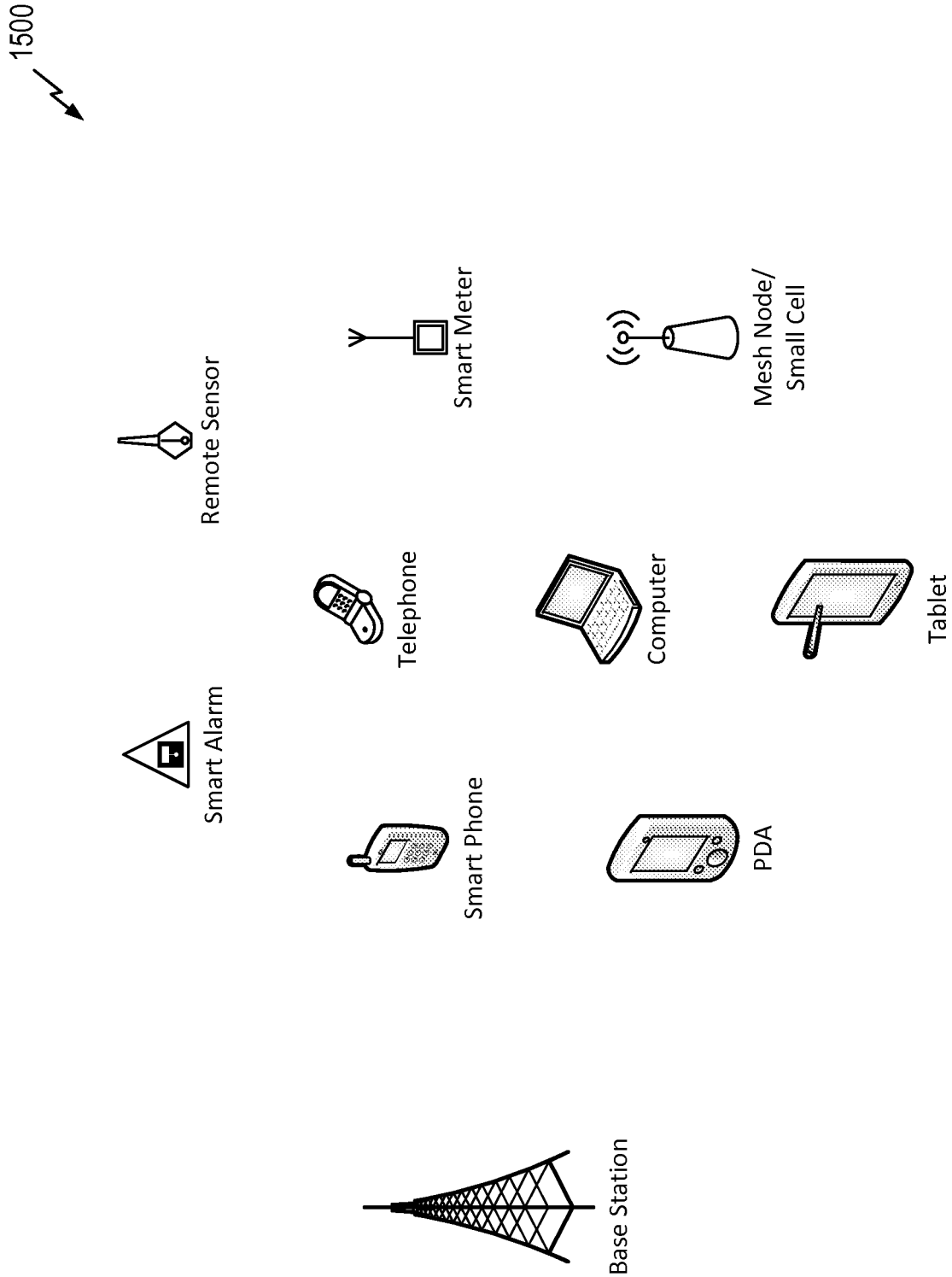
1500
Remote Sensor
Smart Meter
Mesh Node/
Small Cell
Smart Alarm
Telephone
Computer
Tablet
Smart Phone
PDA
Base Station

FIG. 15