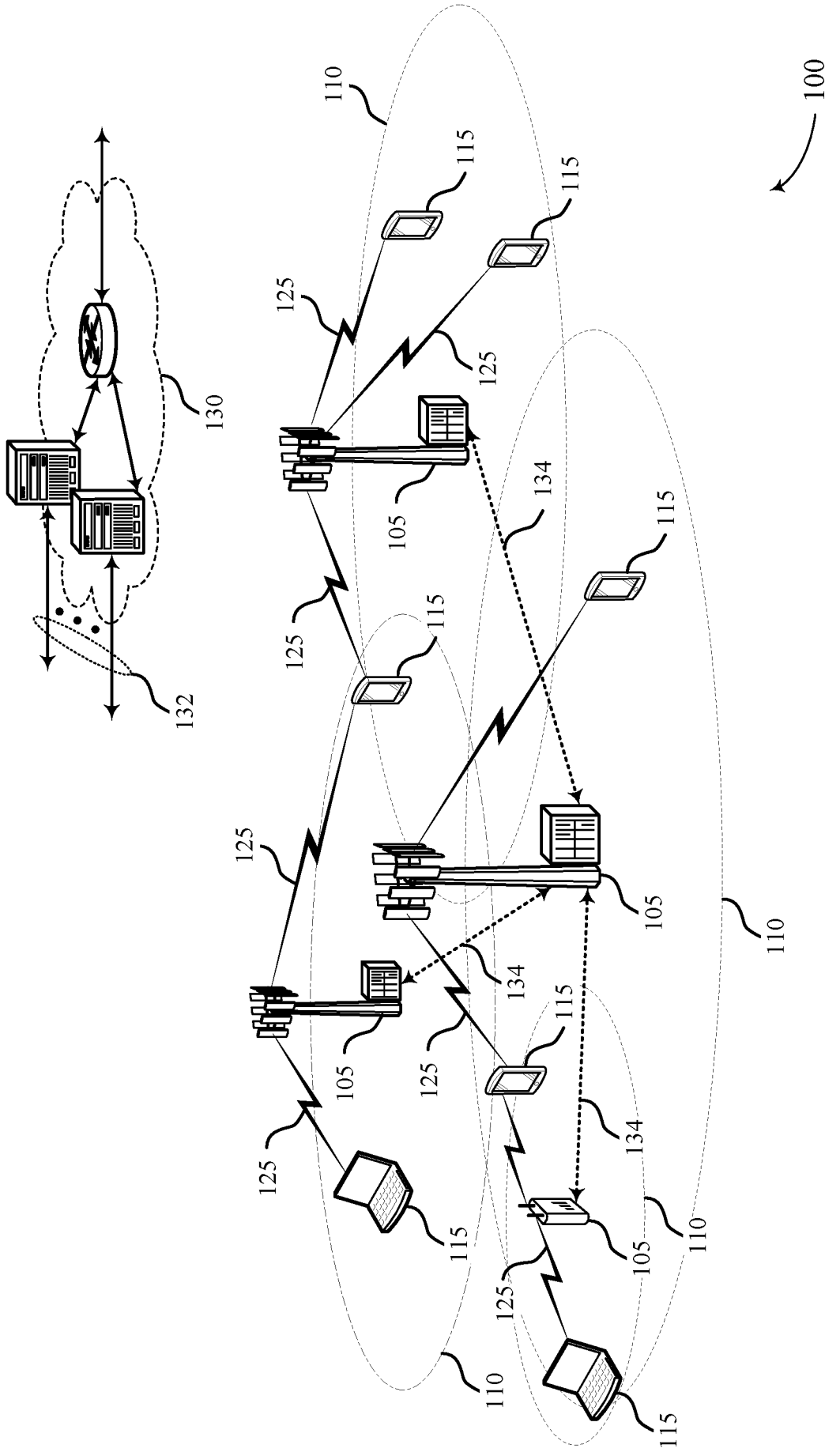

FIG. 1

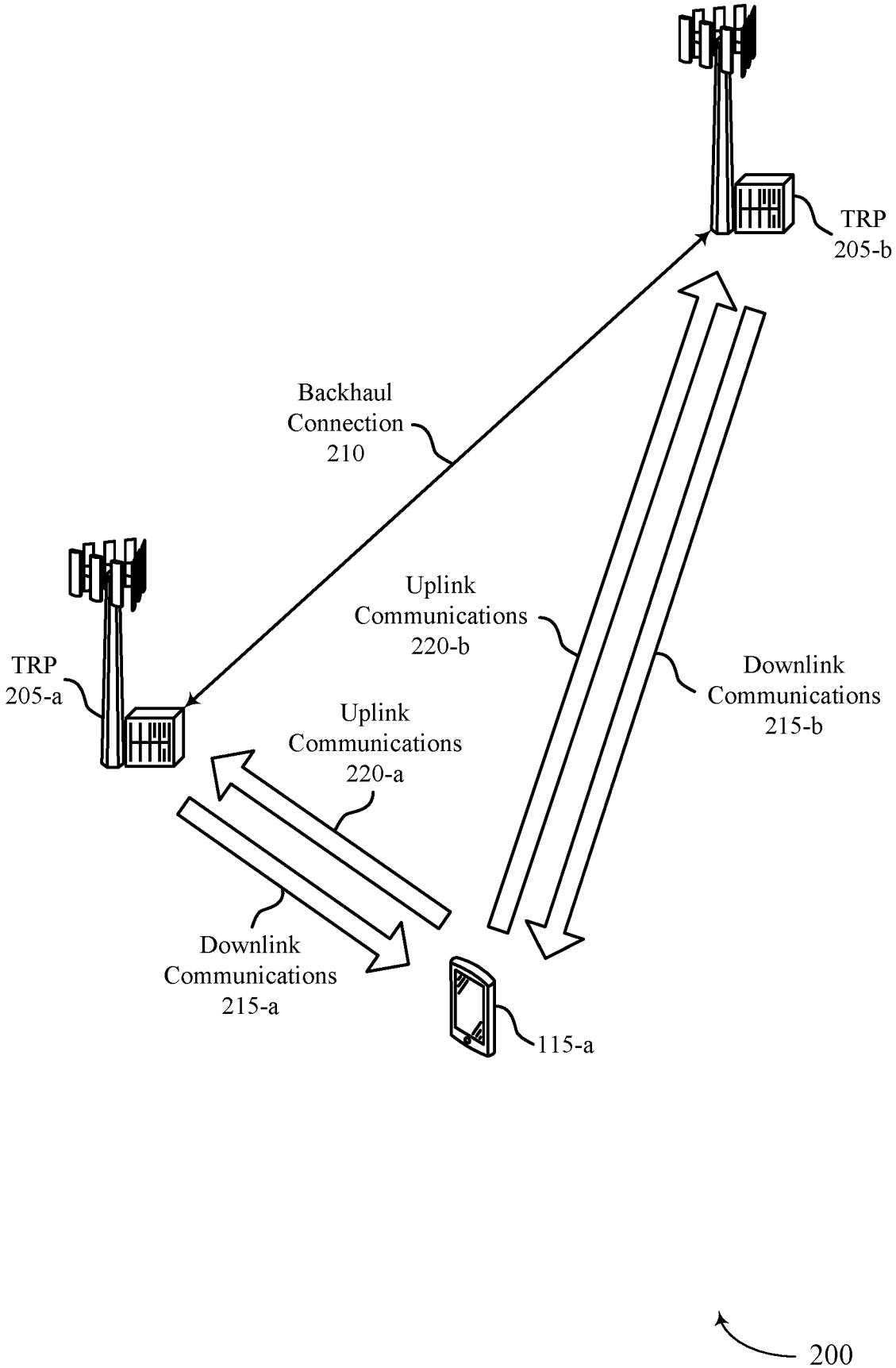
TRP
205-b
Backhaul
Connection
210
Uplink
Communications
220-b
Downlink
Communications
215-b
TRP
205-a
Uplink
Communications
220-a
Downlink
Communications
215-a
115-a
200

FIG. 2

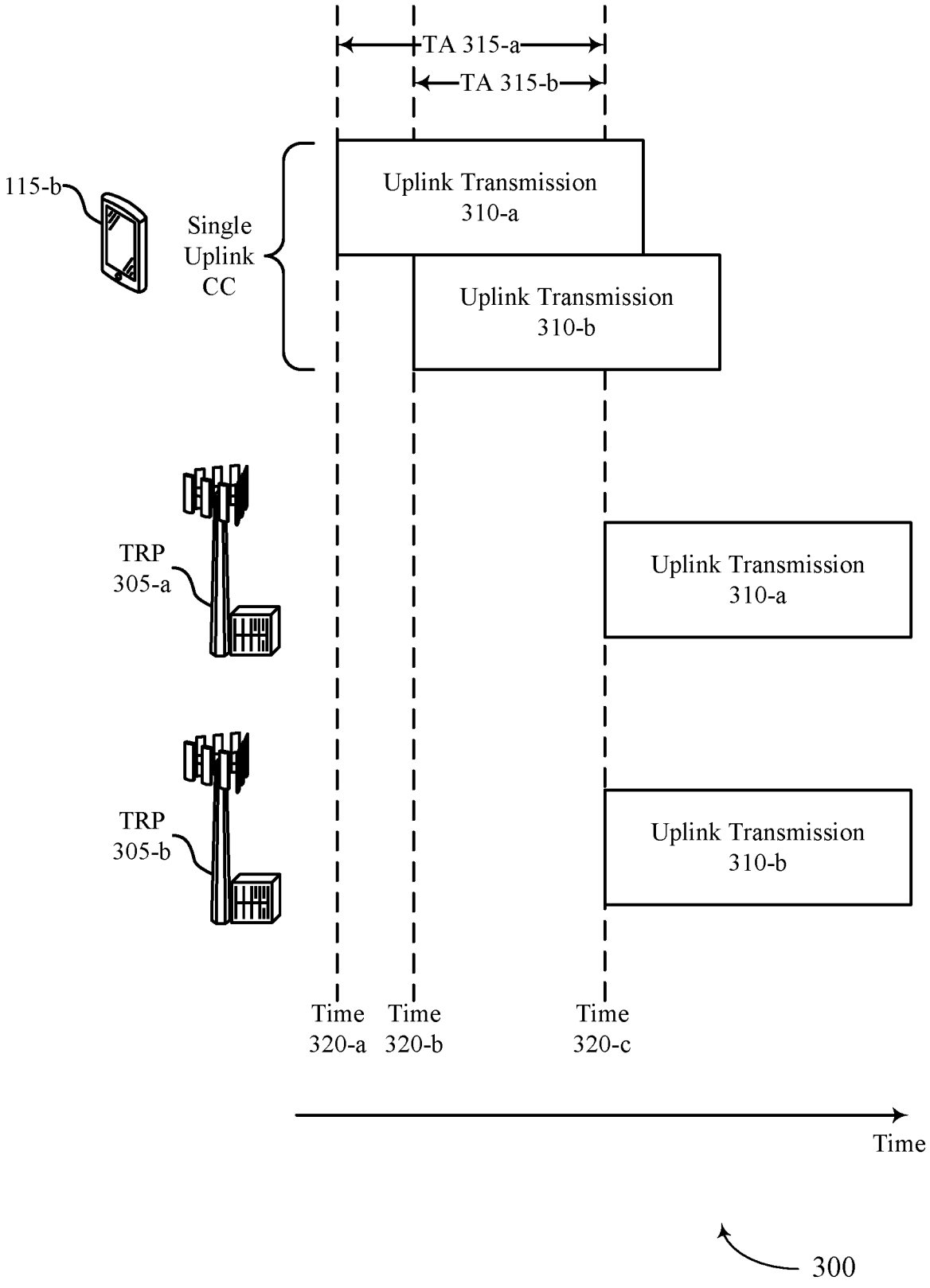
TA 315-a
TA 315-b
115-b
Single Uplink CC
Uplink Transmission 310-a
Uplink Transmission 310-b
TRP 305-a
Uplink Transmission 310-a
TRP 305-b
Uplink Transmission 310-b
Time 320-a
Time 320-b
Time 320-c
Time
300

FIG. 3

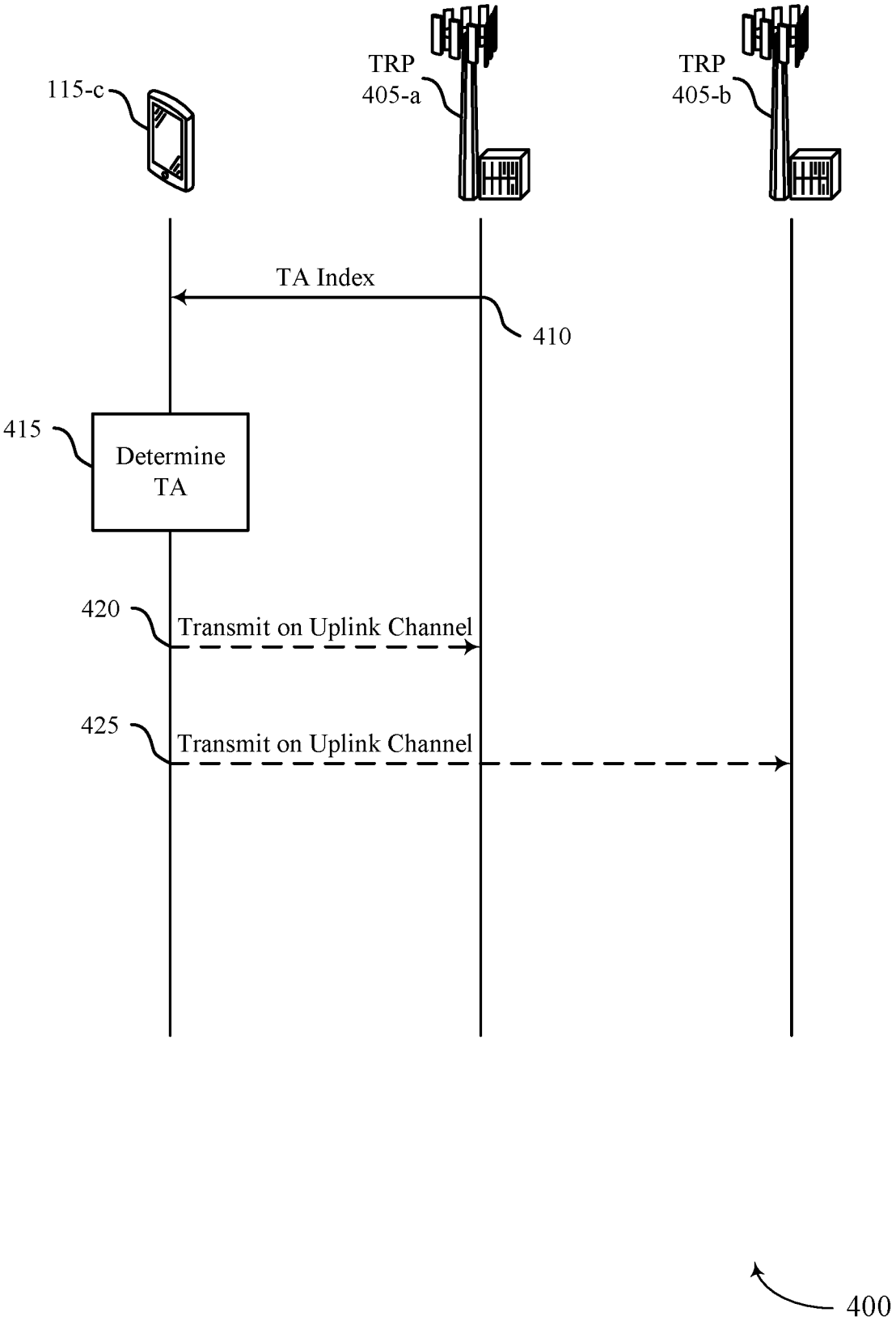
115-c
TRP
405-a
TRP
405-b
TA Index
410
415
Determine
TA
420
Transmit on Uplink Channel
425
Transmit on Uplink Channel
400

FIG. 4

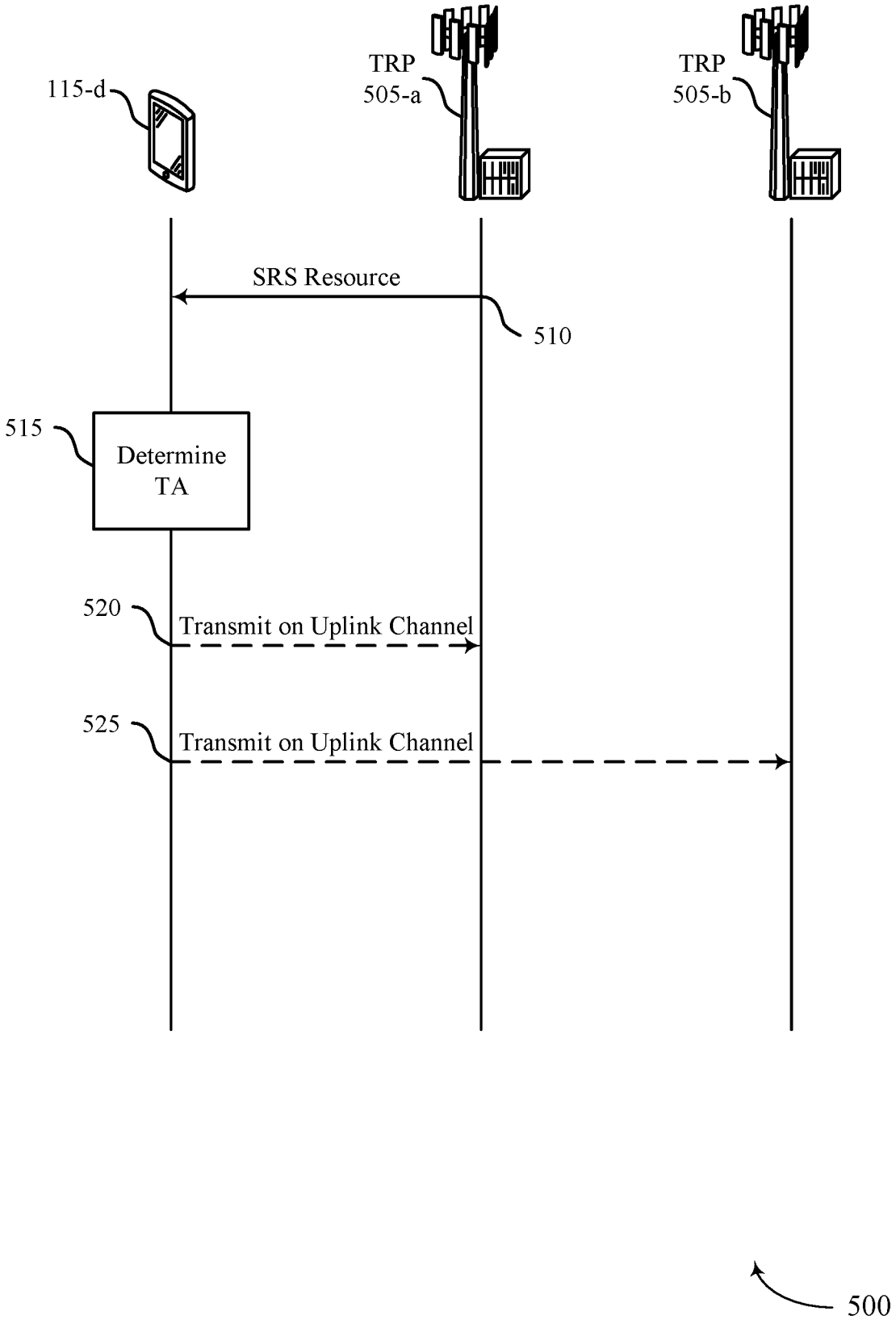
115-d
TRP
505-a
TRP
505-b
SRS Resource
510
515
Determine
TA
520
Transmit on Uplink Channel
525
Transmit on Uplink Channel
500

FIG. 5

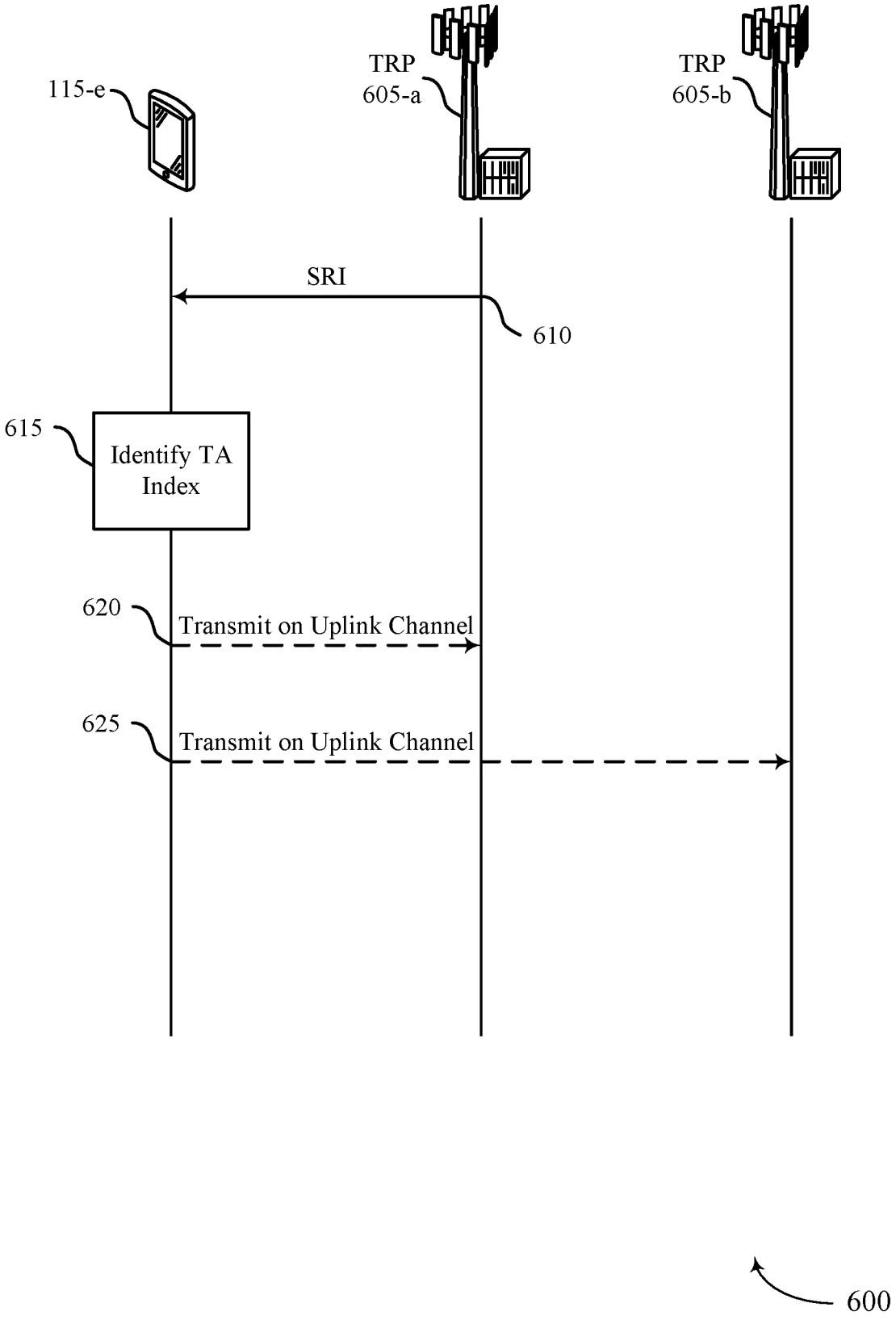
115-e
TRP
605-a
TRP
605-b
SRI
610
615
Identify TA Index
620
Transmit on Uplink Channel
625
Transmit on Uplink Channel
600

FIG. 6

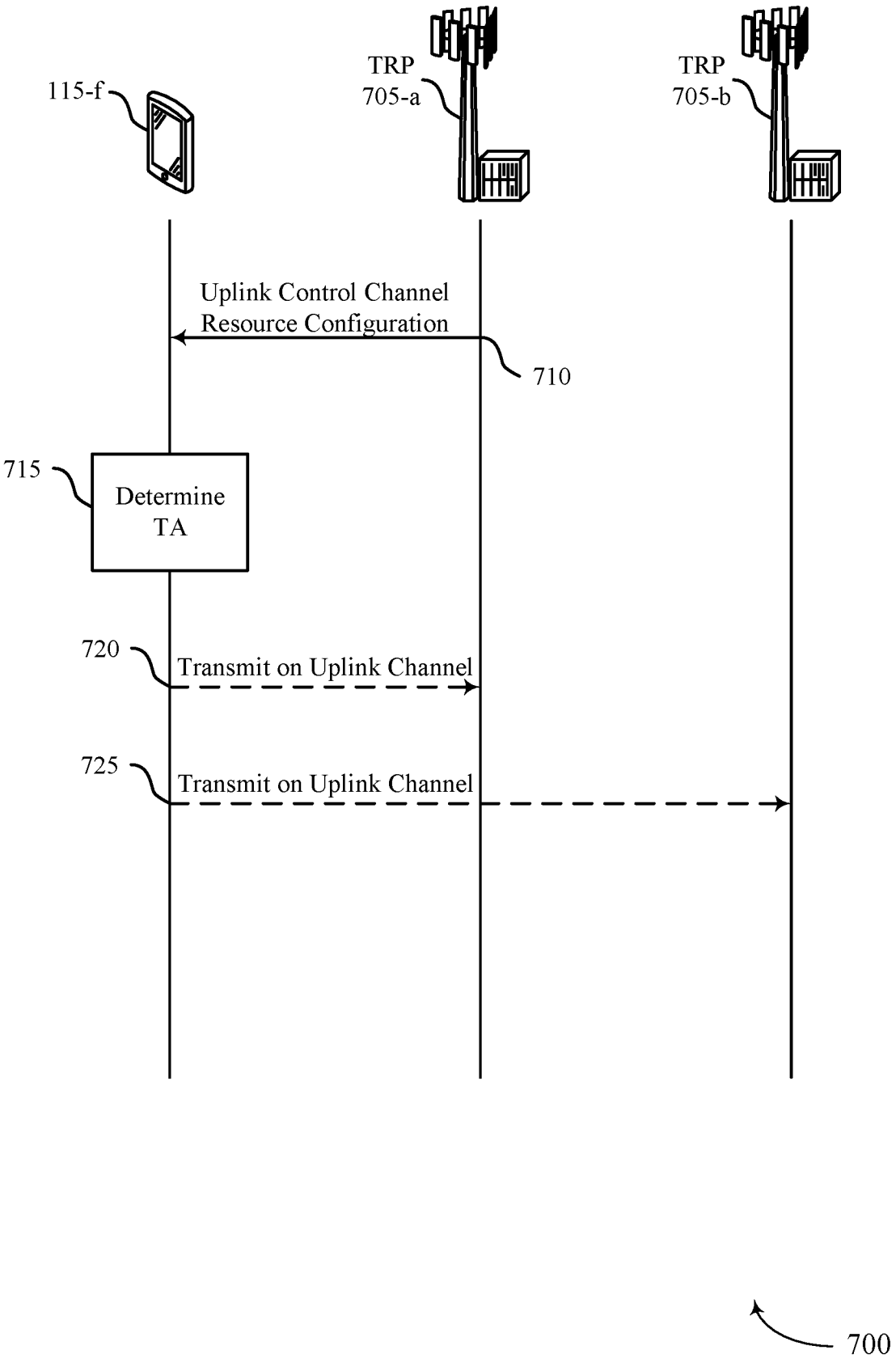
115-f
TRP
705-a
TRP
705-b
Uplink Control Channel
Resource Configuration
710
715
Determine
TA
720
Transmit on Uplink Channel
725
Transmit on Uplink Channel
700

FIG. 7

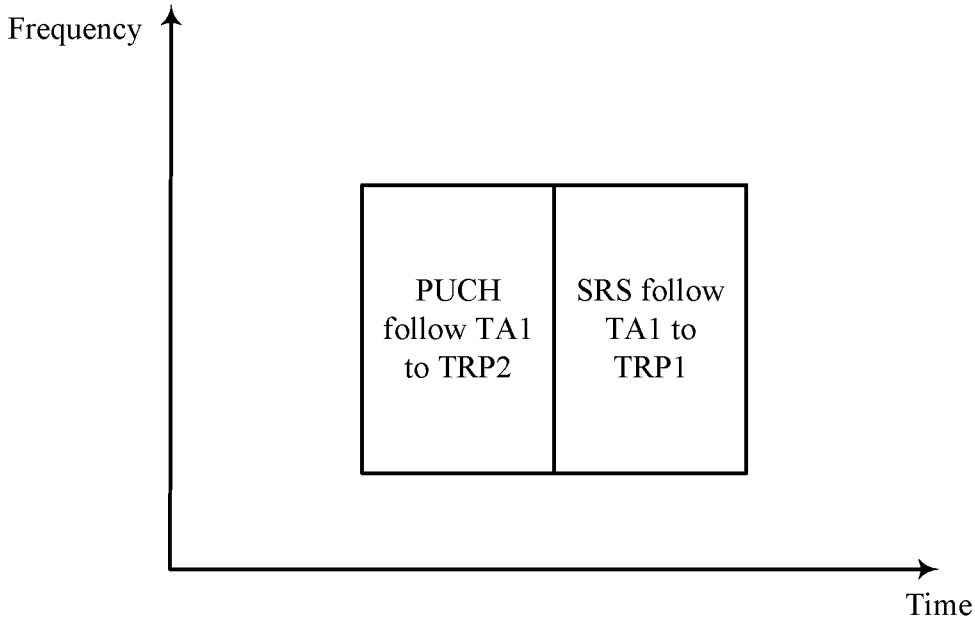
Frequency
PUCH follow TA1 to TRP2
SRS follow TA1 to TRP1
Time
800

FIG. 8A

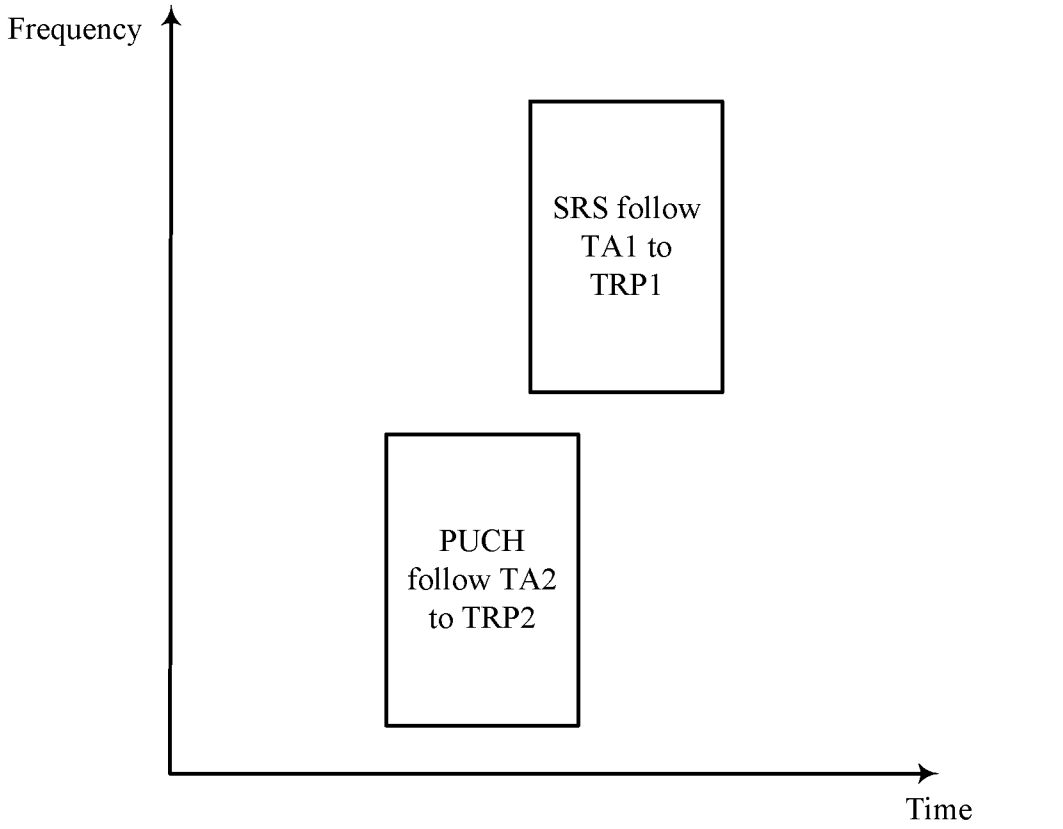
Frequency
SRS follow TA1 to TRP1
PUCH follow TA2 to TRP2
Time
801

FIG. 8B

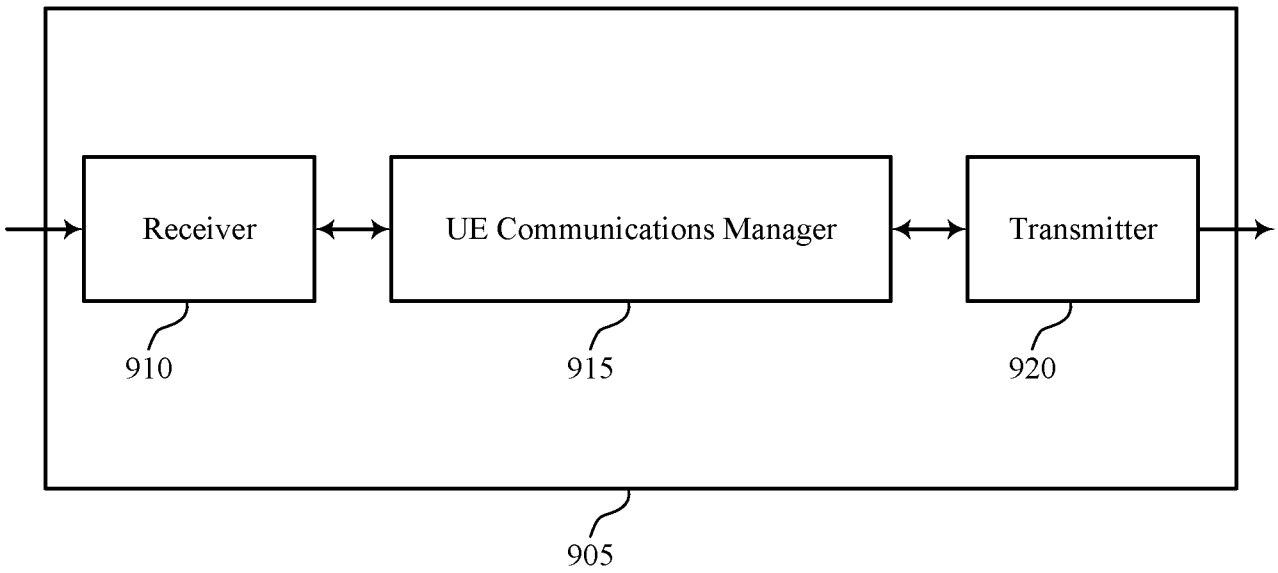
Receiver
UE Communications Manager
Transmitter
910
915
920
905
900

FIG. 9

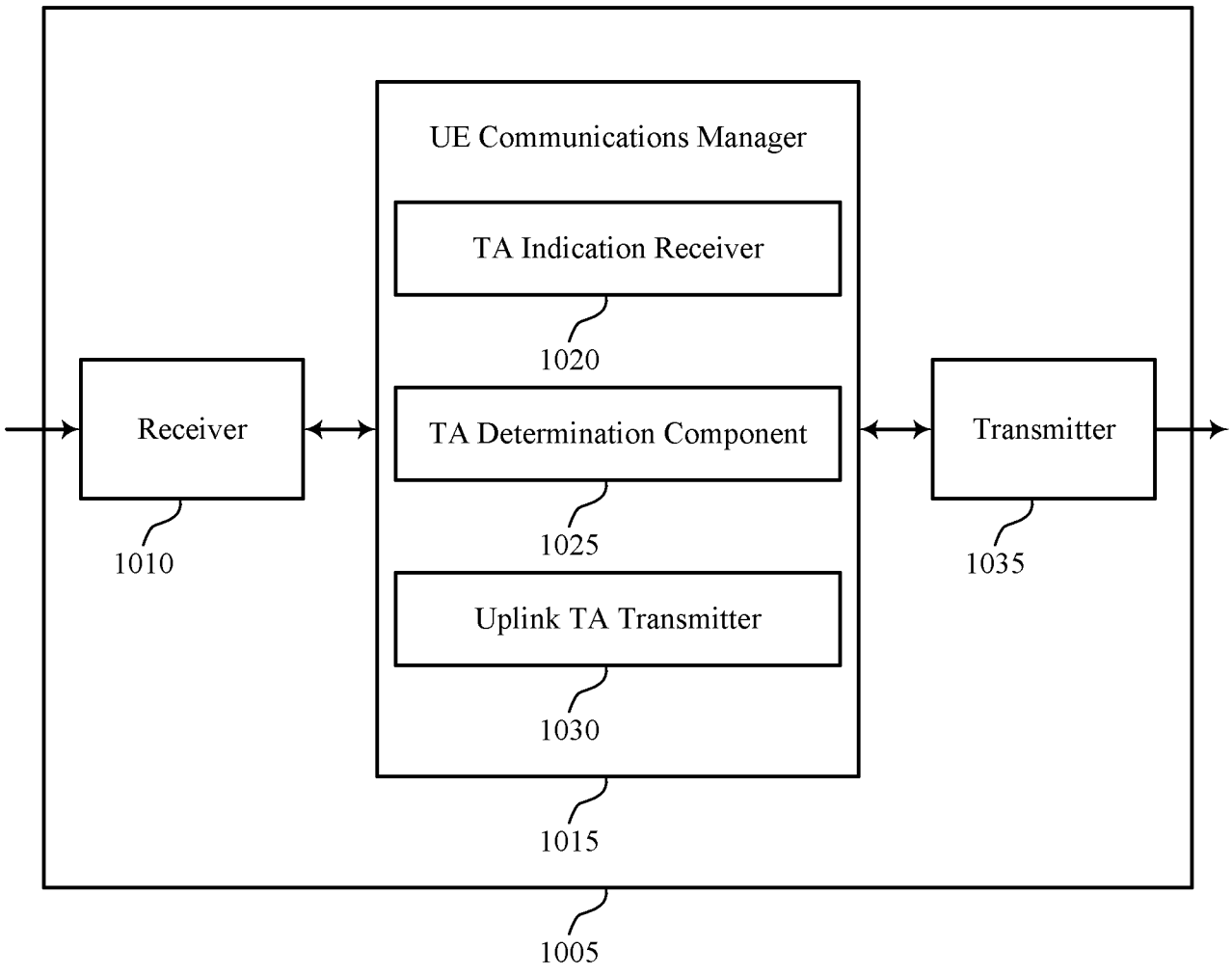
UE Communications Manager
TA Indication Receiver
1020
Receiver
TA Determination Component
Transmitter
1010
1025
1035
Uplink TA Transmitter
1030
1015
1005
1000

FIG. 10

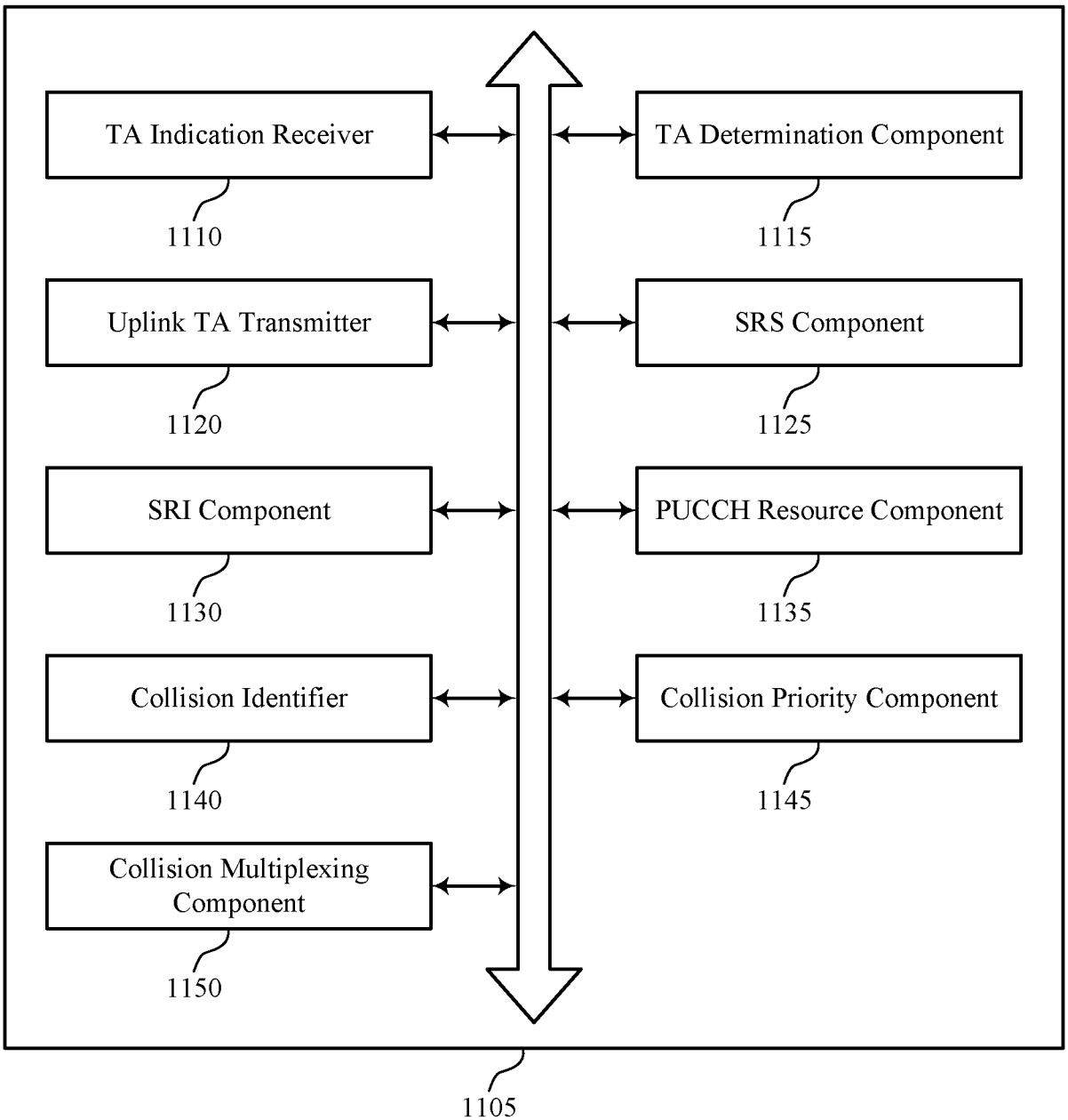
TA Indication Receiver
1110
TA Determination Component
1115
Uplink TA Transmitter
1120
SRS Component
1125
SRI Component
1130
PUCCH Resource Component
1135
Collision Identifier
1140
Collision Priority Component
1145
Collision Multiplexing Component
1150
1105
1100

FIG. 11

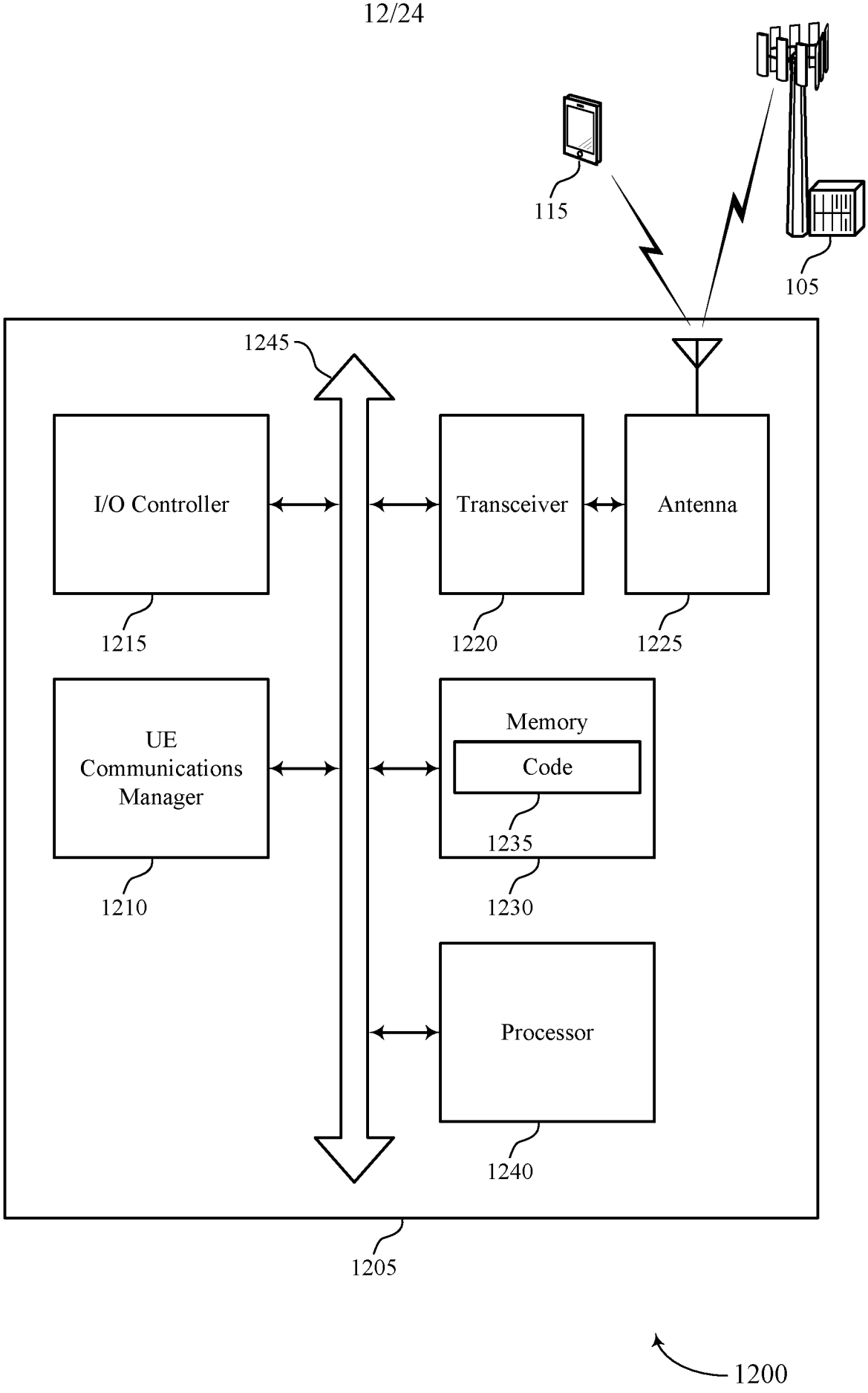
115
105
1245
I/O Controller
Transceiver
Antenna
1215
1220
1225
UE
Communications
Manager
Memory
Code
1235
1210
1230
Processor
1240
1205
1200

FIG. 12

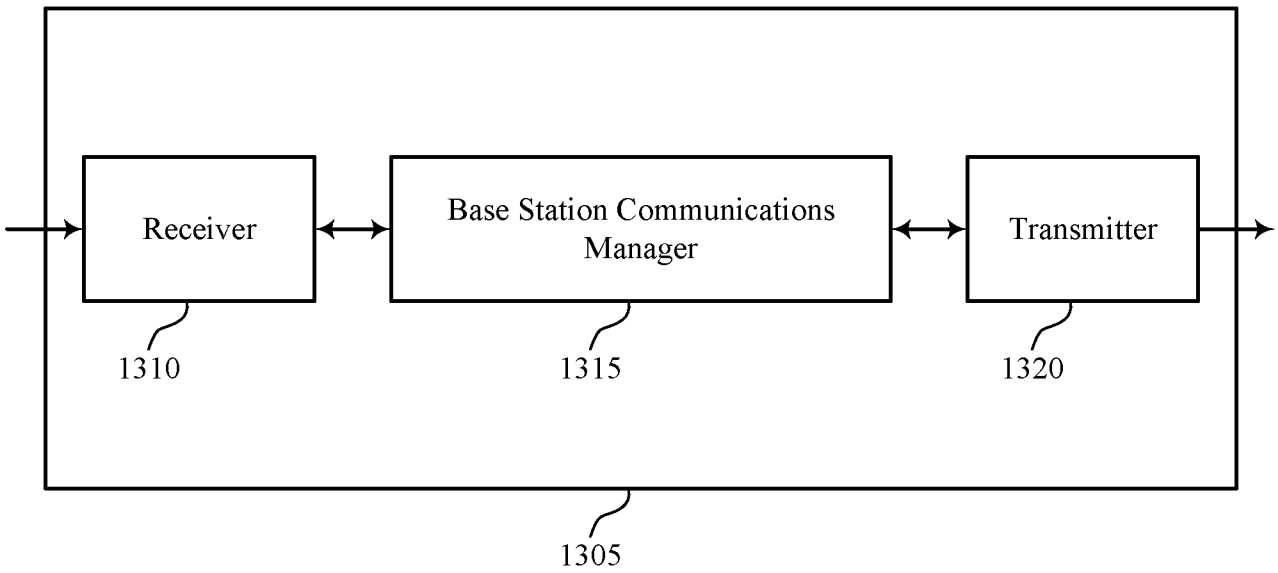
Receiver
Base Station Communications Manager
Transmitter
1310
1315
1320
1305
1300

FIG. 13

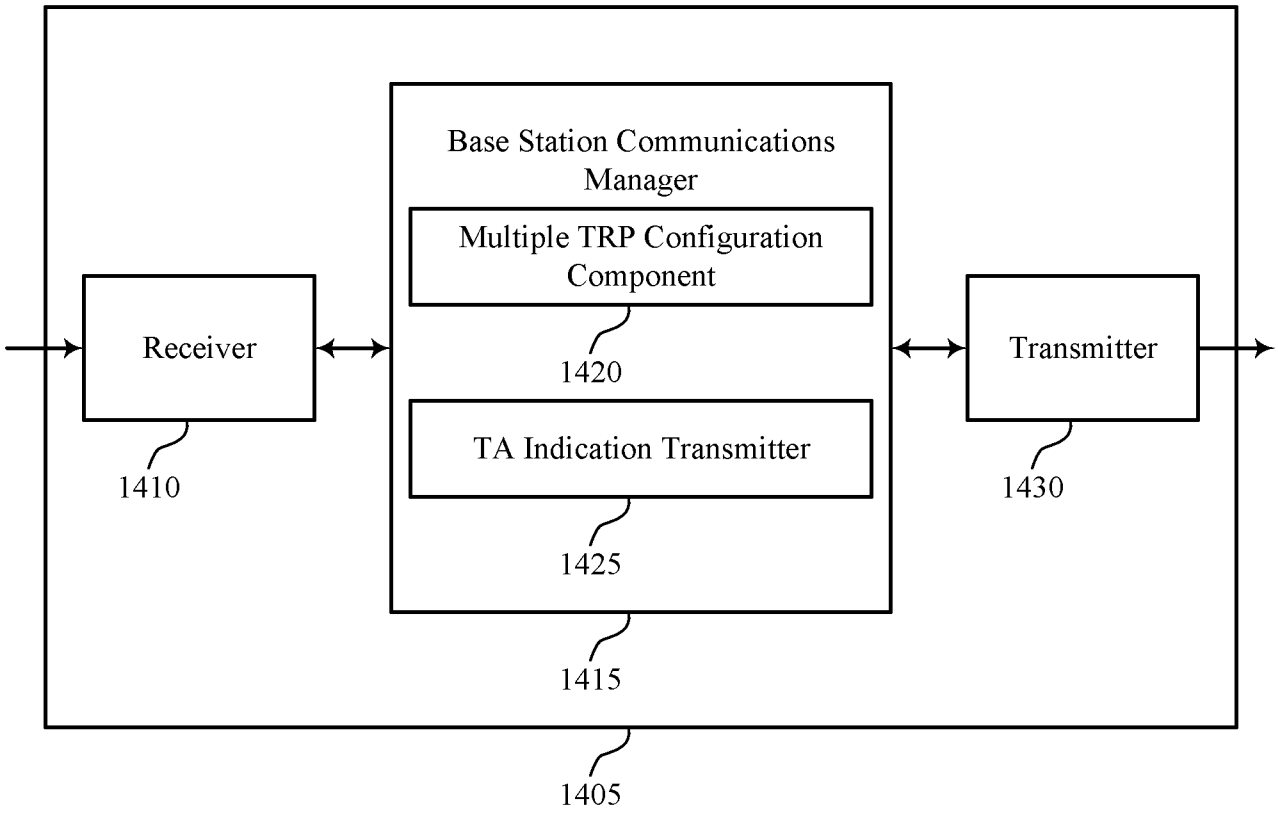
Base Station Communications Manager
Multiple TRP Configuration Component
1420
TA Indication Transmitter
1425
1415
Receiver
1410
Transmitter
1430
1405
1400

FIG. 14

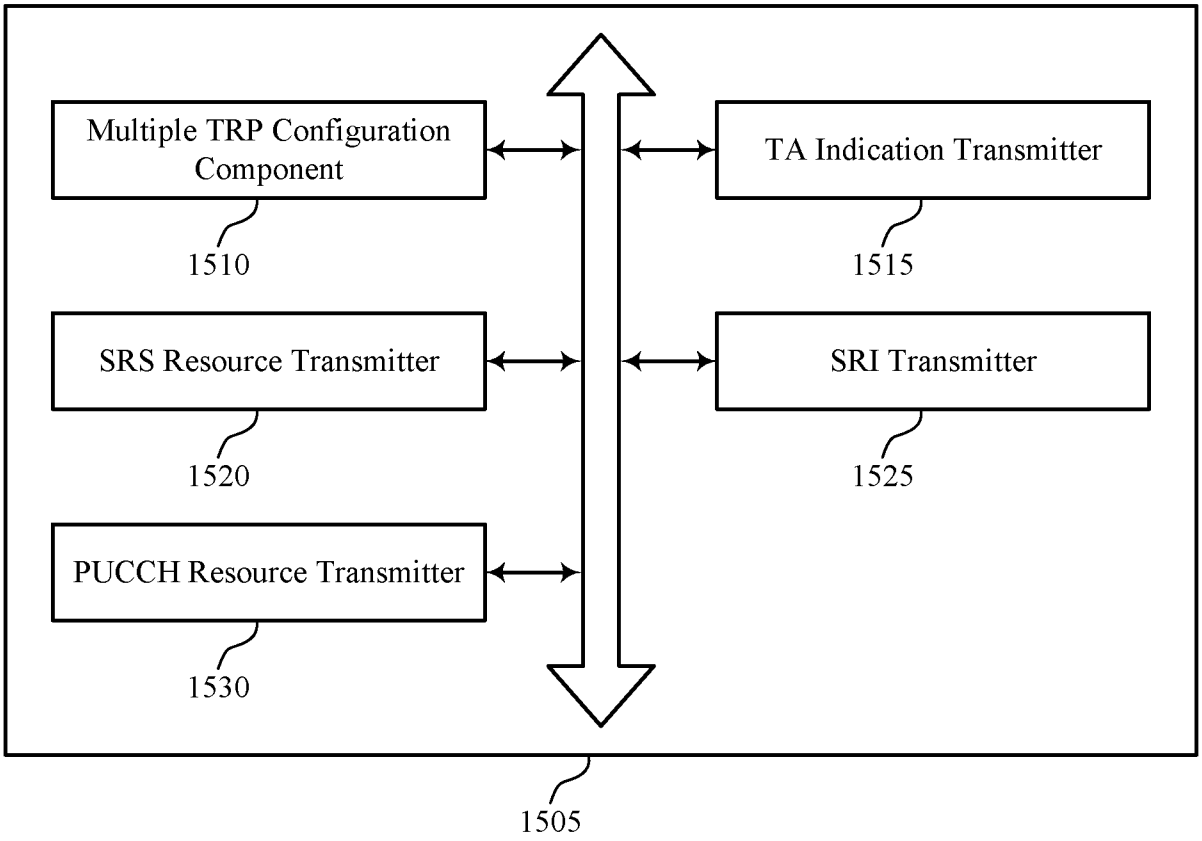
Multiple TRP Configuration Component
1510
TA Indication Transmitter
1515
SRS Resource Transmitter
1520
SRI Transmitter
1525
PUCCH Resource Transmitter
1530
1505
1500

FIG. 15

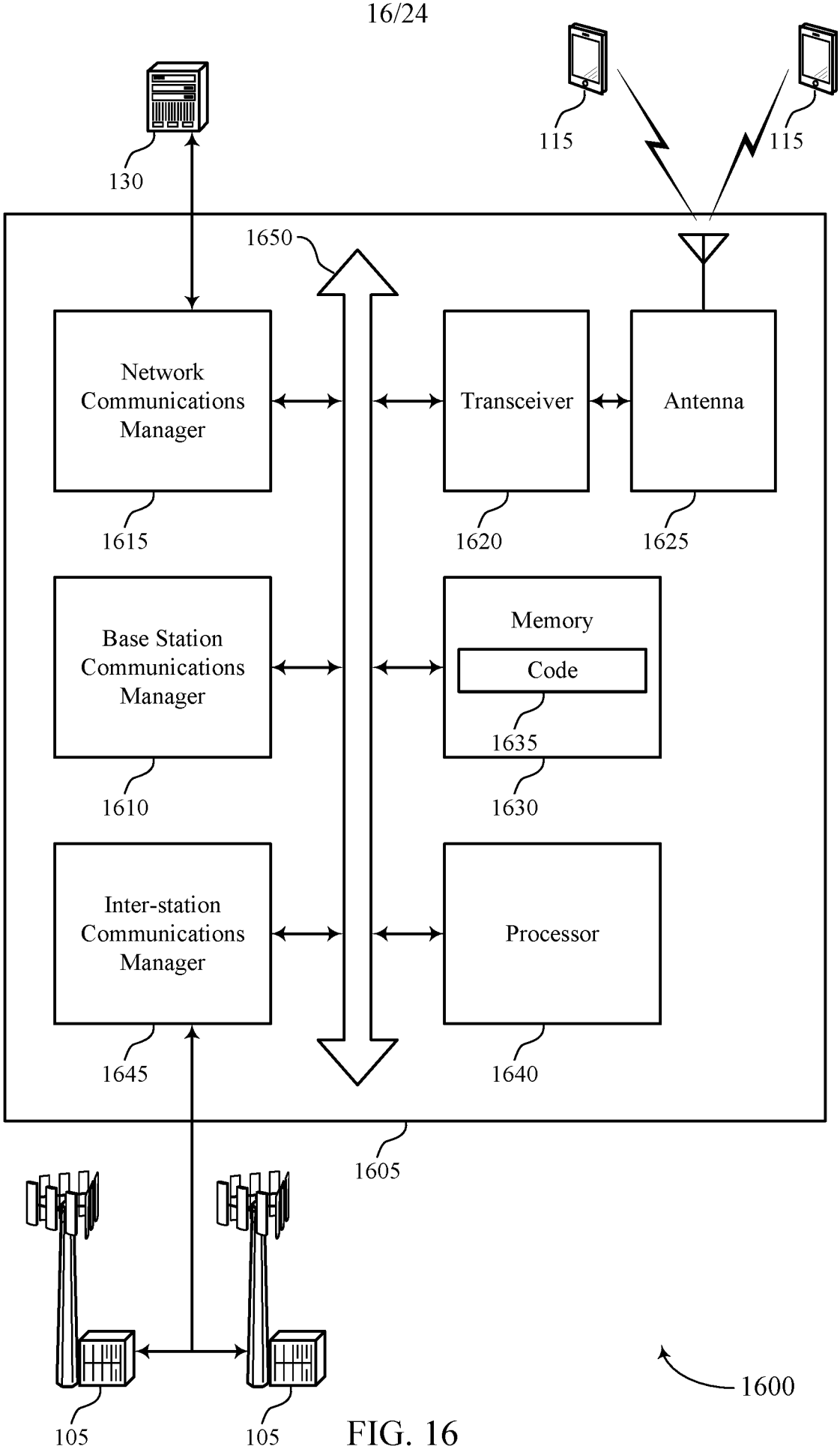
130
115
115
1650
Network Communications Manager
Transceiver
Antenna
1615
1620
1625
Base Station Communications Manager
Memory
Code
1635
1610
1630
Inter-station Communications Manager
Processor
1645
1640
1605
105
105
1600

FIG. 16

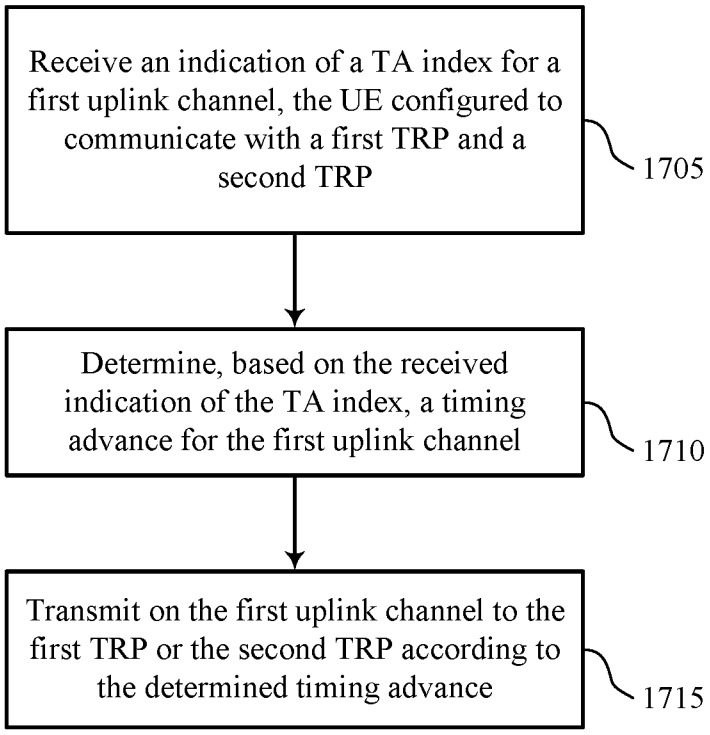
Receive an indication of a TA index for a first uplink channel, the UE configured to communicate with a first TRP and a second TRP
1705
Determine, based on the received indication of the TA index, a timing advance for the first uplink channel
1710
Transmit on the first uplink channel to the first TRP or the second TRP according to the determined timing advance
1715
1700

FIG. 17

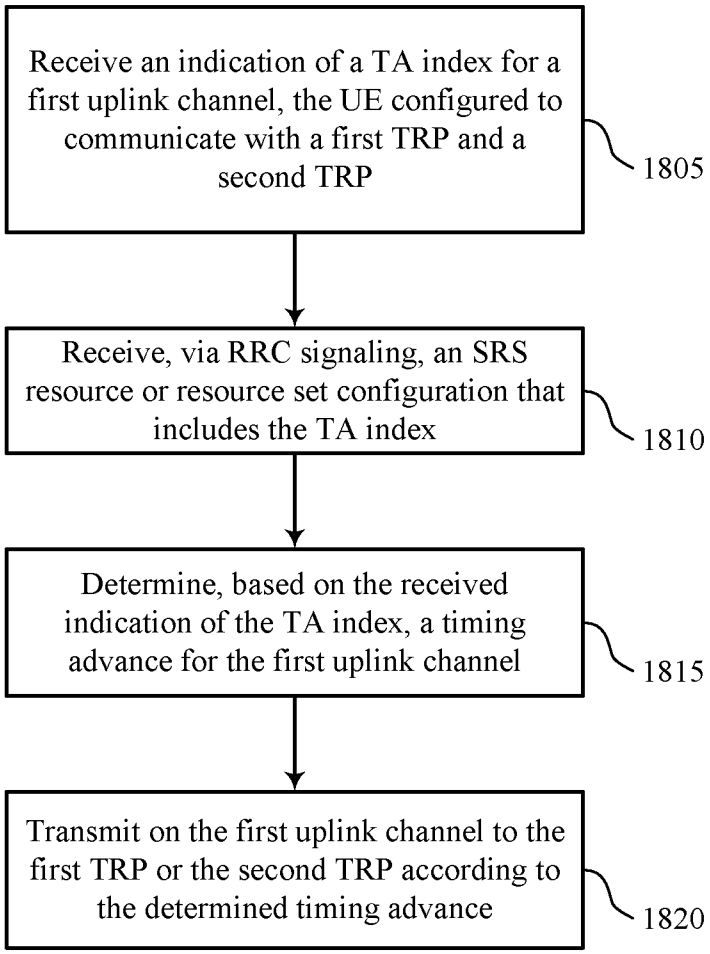
Receive an indication of a TA index for a first uplink channel, the UE configured to communicate with a first TRP and a second TRP
1805
Receive, via RRC signaling, an SRS resource or resource set configuration that includes the TA index
1810
Determine, based on the received indication of the TA index, a timing advance for the first uplink channel
1815
Transmit on the first uplink channel to the first TRP or the second TRP according to the determined timing advance
1820
1800

FIG. 18

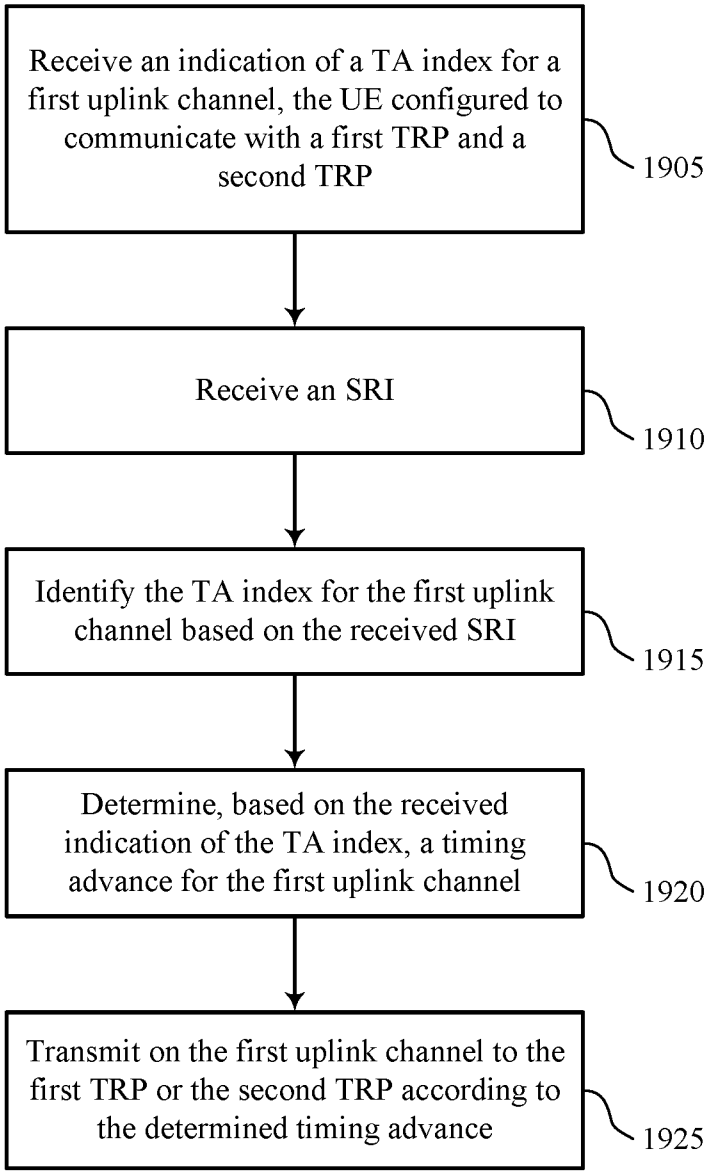
Receive an indication of a TA index for a first uplink channel, the UE configured to communicate with a first TRP and a second TRP
1905
Receive an SRI
1910
Identify the TA index for the first uplink channel based on the received SRI
1915
Determine, based on the received indication of the TA index, a timing advance for the first uplink channel
1920
Transmit on the first uplink channel to the first TRP or the second TRP according to the determined timing advance
1925
1900

FIG. 19

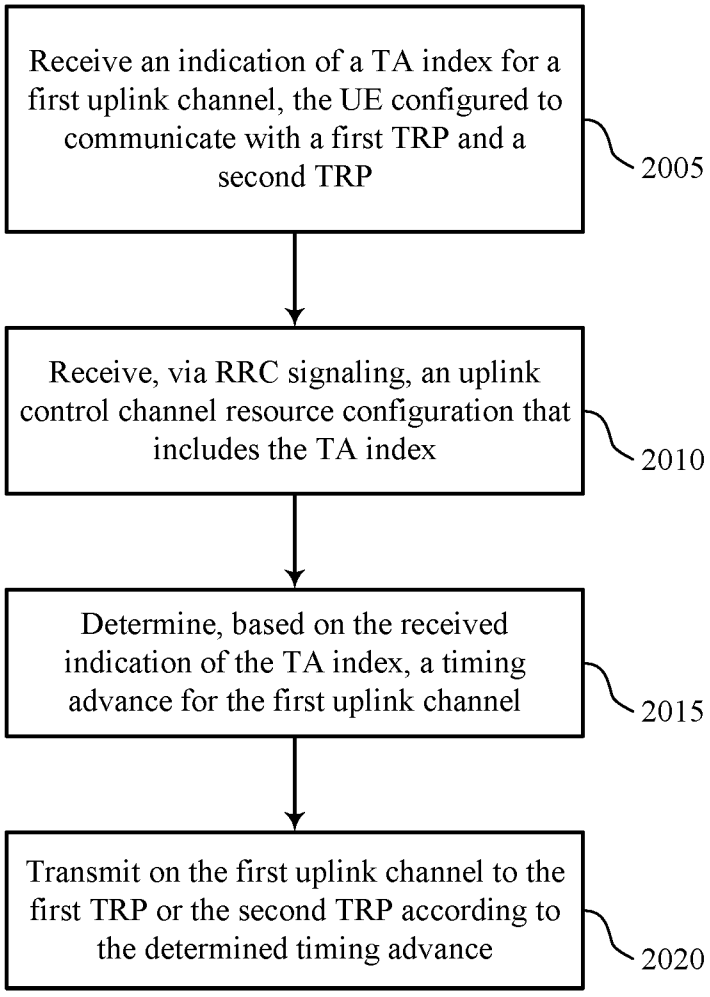
Receive an indication of a TA index for a first uplink channel, the UE configured to communicate with a first TRP and a second TRP
2005
Receive, via RRC signaling, an uplink control channel resource configuration that includes the TA index
2010
Determine, based on the received indication of the TA index, a timing advance for the first uplink channel
2015
Transmit on the first uplink channel to the first TRP or the second TRP according to the determined timing advance
2020
2000

FIG. 20

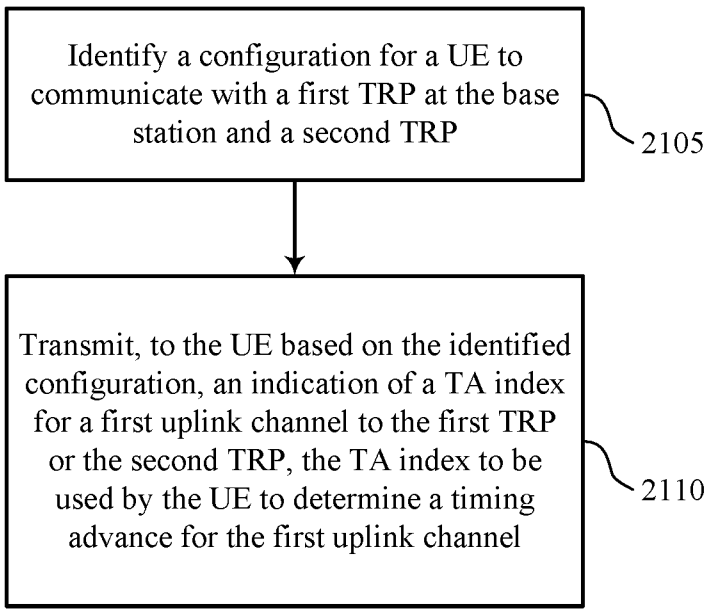
Identify a configuration for a UE to communicate with a first TRP at the base station and a second TRP
2105
Transmit, to the UE based on the identified configuration, an indication of a TA index for a first uplink channel to the first TRP or the second TRP, the TA index to be used by the UE to determine a timing advance for the first uplink channel
2110
2100

FIG. 21

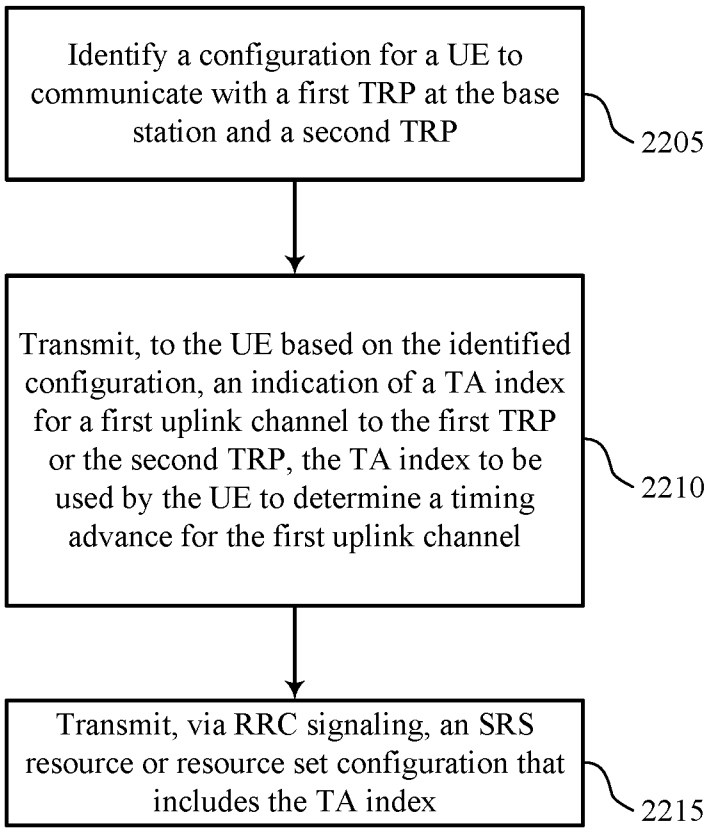
Identify a configuration for a UE to communicate with a first TRP at the base station and a second TRP
2205
Transmit, to the UE based on the identified configuration, an indication of a TA index for a first uplink channel to the first TRP or the second TRP, the TA index to be used by the UE to determine a timing advance for the first uplink channel
2210
Transmit, via RRC signaling, an SRS resource or resource set configuration that includes the TA index
2215
2200

FIG. 22

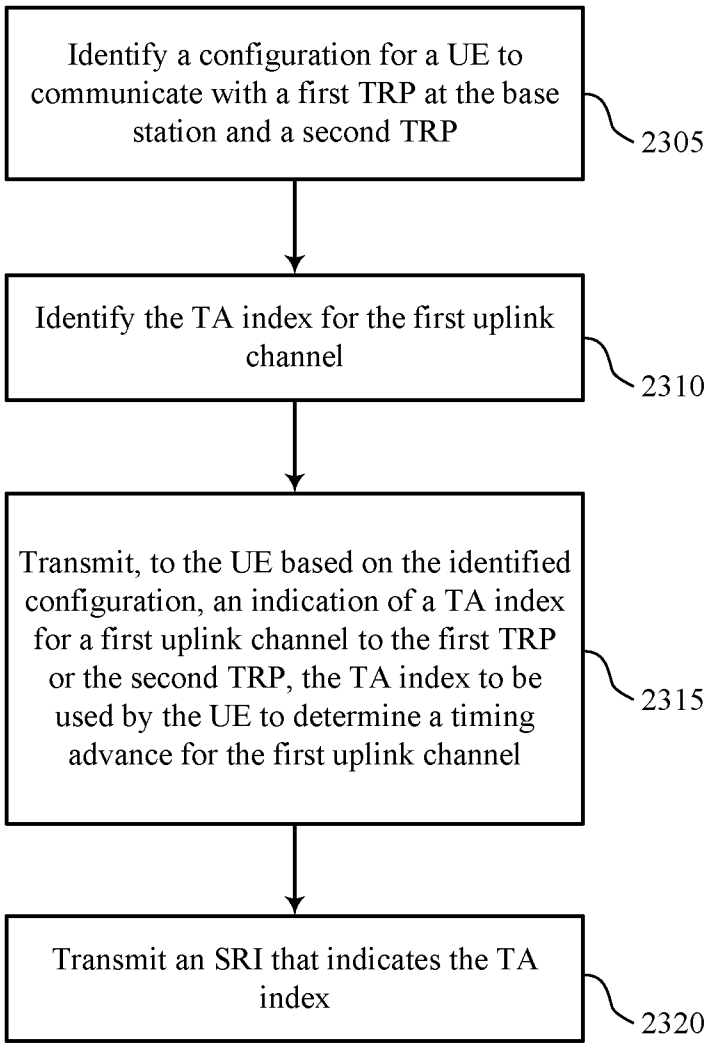
Identify a configuration for a UE to communicate with a first TRP at the base station and a second TRP
2305
Identify the TA index for the first uplink channel
2310
Transmit, to the UE based on the identified configuration, an indication of a TA index for a first uplink channel to the first TRP or the second TRP, the TA index to be used by the UE to determine a timing advance for the first uplink channel
2315
Transmit an SRI that indicates the TA index
2320
2300

FIG. 23

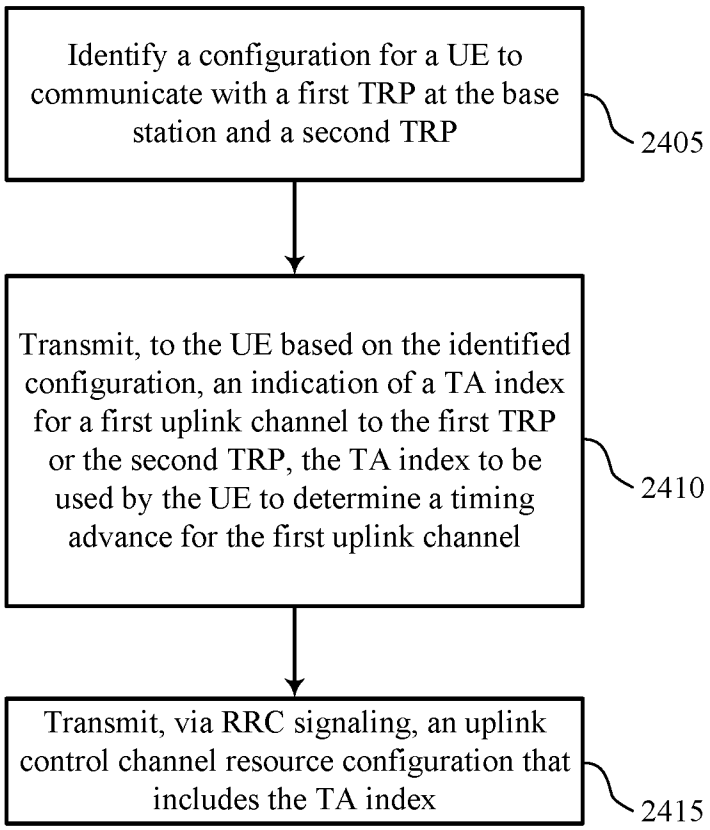
Identify a configuration for a UE to communicate with a first TRP at the base station and a second TRP
2405
Transmit, to the UE based on the identified configuration, an indication of a TA index for a first uplink channel to the first TRP or the second TRP, the TA index to be used by the UE to determine a timing advance for the first uplink channel
2410
Transmit, via RRC signaling, an uplink control channel resource configuration that includes the TA index
2415
2400

FIG. 24