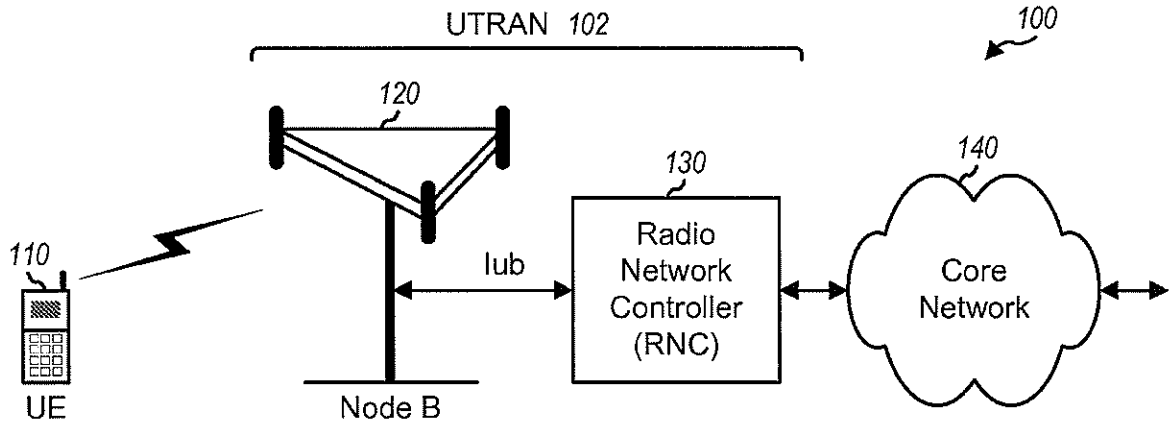

UTRAN 102
100
120
130
140
110
Iub
Radio Network Controller (RNC)
Core Network
UE
Node B

FIG. 1

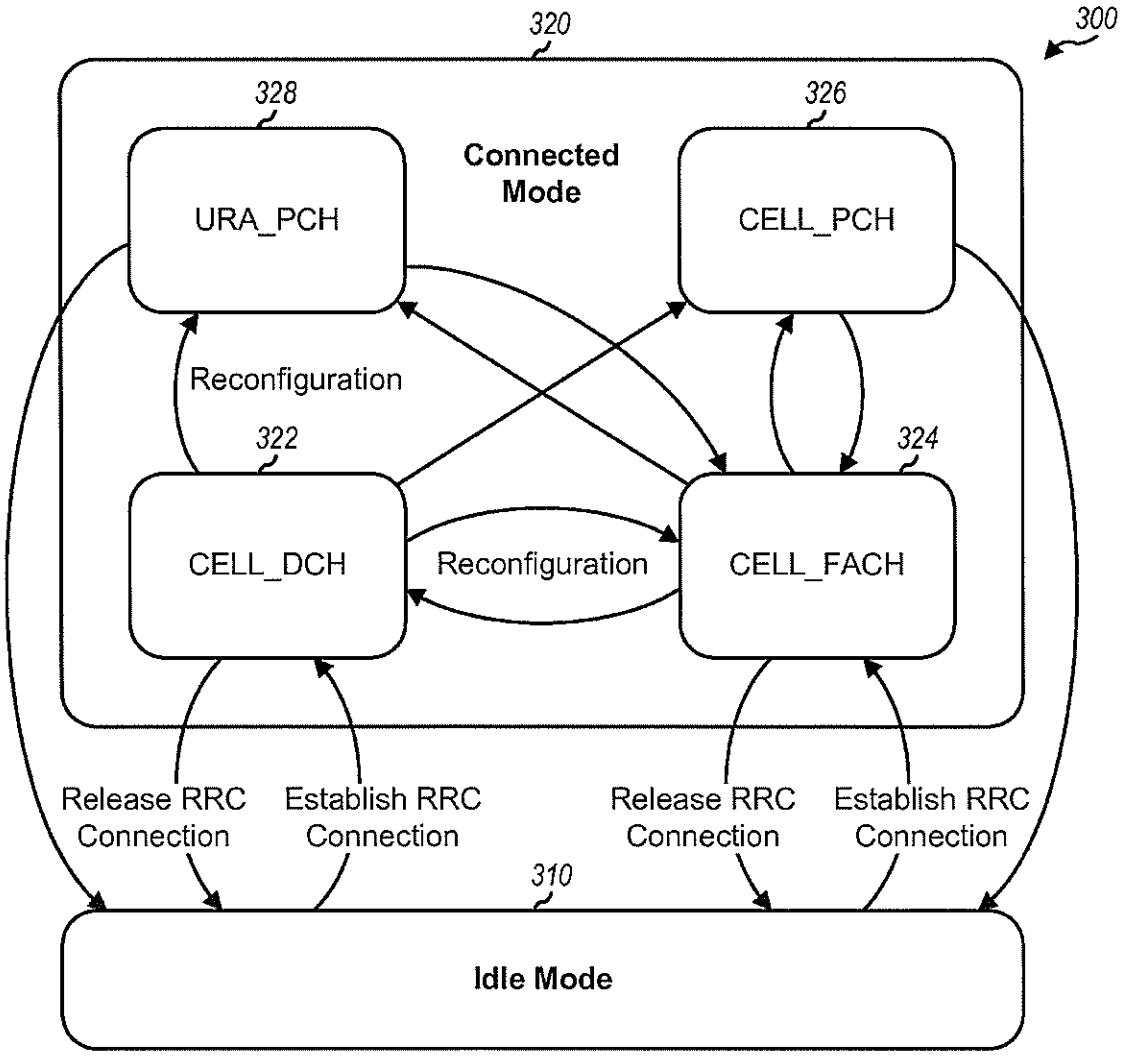

320
300
328
326
Connected Mode
URA_PCH
CELL_PCH
Reconfiguration
322
324
CELL_DCH
Reconfiguration
CELL_FACH
Release RRC Connection
Establish RRC Connection
Release RRC Connection
Establish RRC Connection
310
Idle Mode

FIG. 3

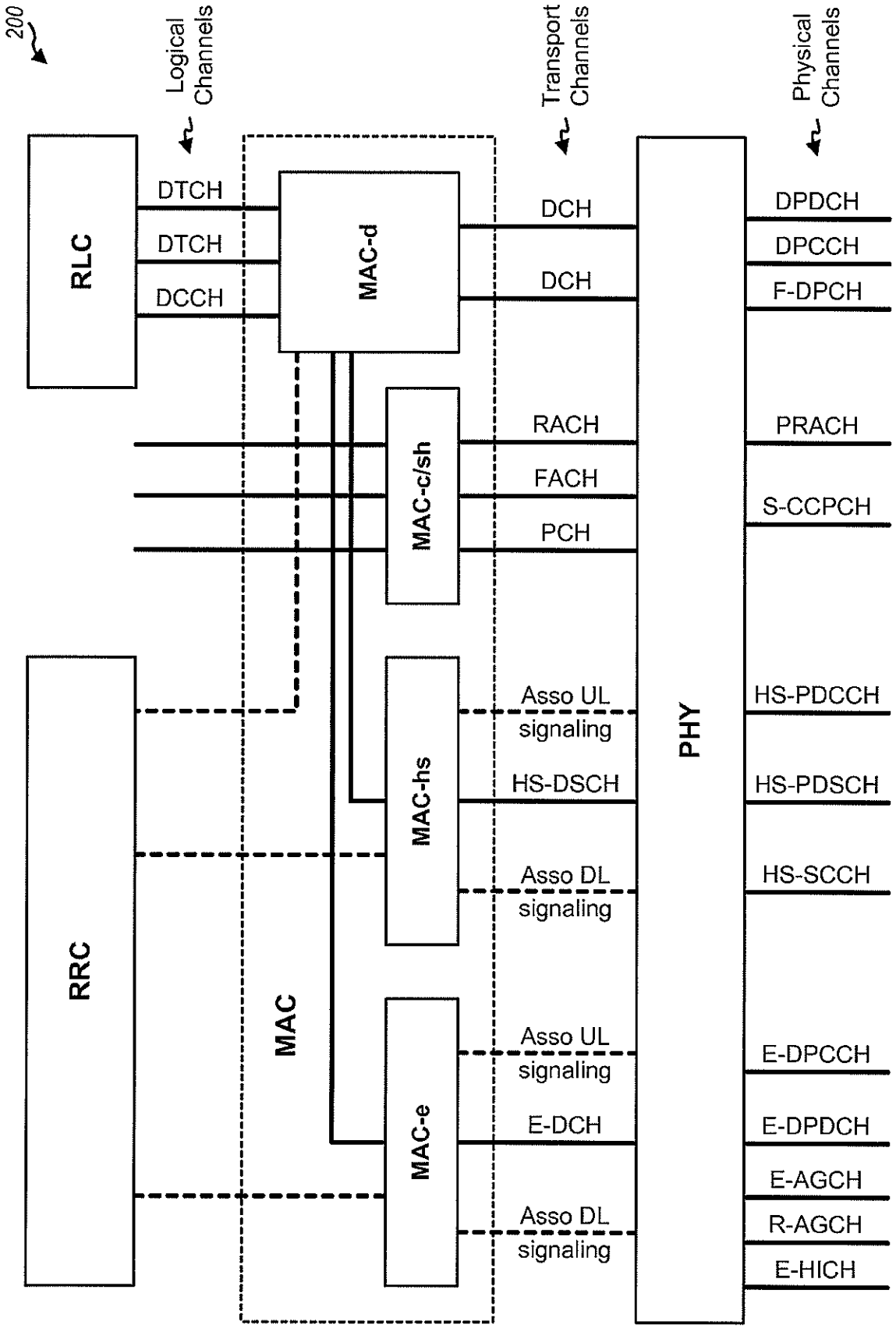

200
Logical Channels
Transport Channels
Physical Channels
RLC
DTCH
DTCH
DCCH
MAC-d
DCH
DCH
DPDCH
DPCCH
F-DPCH
MAC-c/sh
RACH
FACH
PCH
PRACH
S-CCPCH
RRC
MAC
MAC-hs
Asso UL signaling
HS-DSCH
Asso DL signaling
HS-PDCCH
HS-PDSCH
HS-SCCH
MAC-e
Asso UL signaling
E-DCH
Asso DL signaling
E-DPCCH
E-DPDCH
E-AGCH
R-AGCH
E-HICH
PHY

FIG. 2

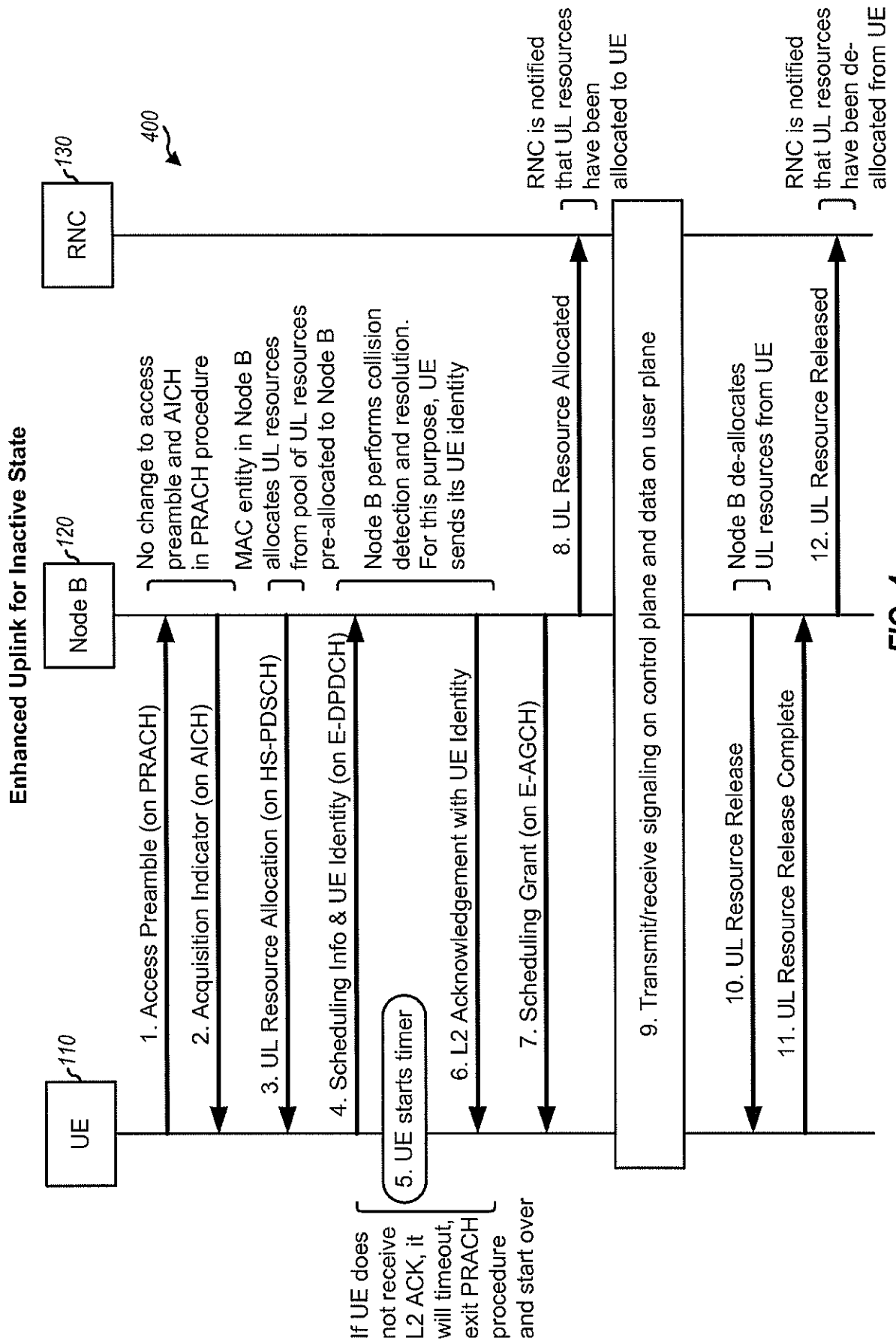

Enhanced Uplink for Inactive State
400
UE
110
Node B
120
RNC
130
1. Access Preamble (on PRACH)
2. Acquisition Indicator (on AICH)
3. UL Resource Allocation (on HS-PDSCH)
4. Scheduling Info & UE Identity (on E-DPDCH)
5. UE starts timer
6. L2 Acknowledgement with UE Identity
7. Scheduling Grant (on E-AGCH)
8. UL Resource Allocated
9. Transmit/receive signaling on control plane and data on user plane
10. UL Resource Release
11. UL Resource Release Complete
12. UL Resource Released
No change to access preamble and AICH in PRACH procedure
MAC entity in Node B allocates UL resources from pool of UL resources pre-allocated to Node B
Node B performs collision detection and resolution. For this purpose, UE sends its UE identity
RNC is notified that UL resources have been allocated to UE
Node B de-allocates UL resources from UE
RNC is notified that UL resources have been de-allocated from UE
If UE does not receive L2 ACK, it will timeout, exit PRACH procedure and start over

FIG. 4

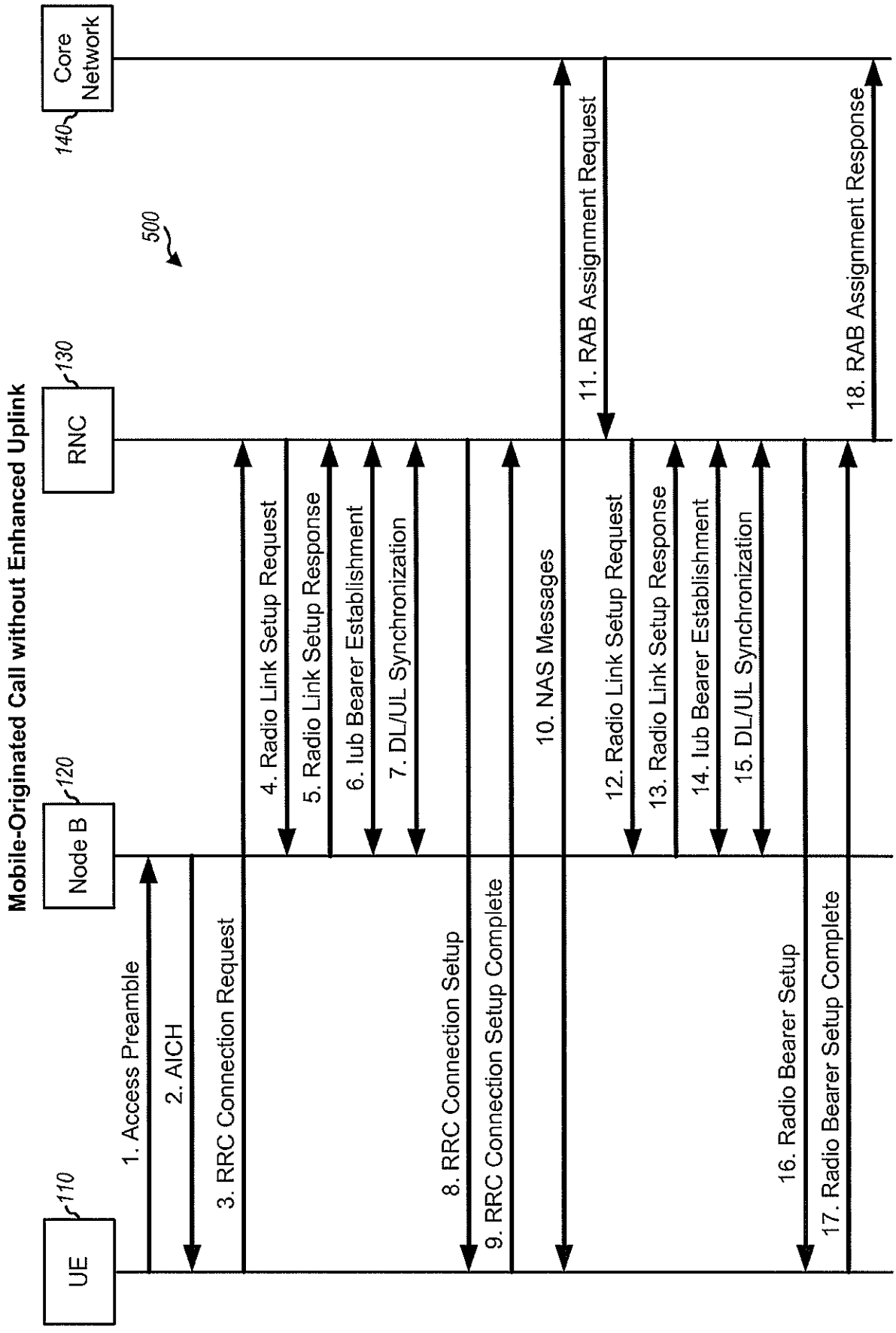

Mobile-Originated Call without Enhanced Uplink
UE
110
Node B
120
RNC
130
Core Network
140
500
1. Access Preamble
2. AICH
3. RRC Connection Request
4. Radio Link Setup Request
5. Radio Link Setup Response
6. Iub Bearer Establishment
7. DL/UL Synchronization
8. RRC Connection Setup
9. RRC Connection Setup Complete
10. NAS Messages
11. RAB Assignment Request
12. Radio Link Setup Request
13. Radio Link Setup Response
14. Iub Bearer Establishment
15. DL/UL Synchronization
16. Radio Bearer Setup
17. Radio Bearer Setup Complete
18. RAB Assignment Response

FIG. 5

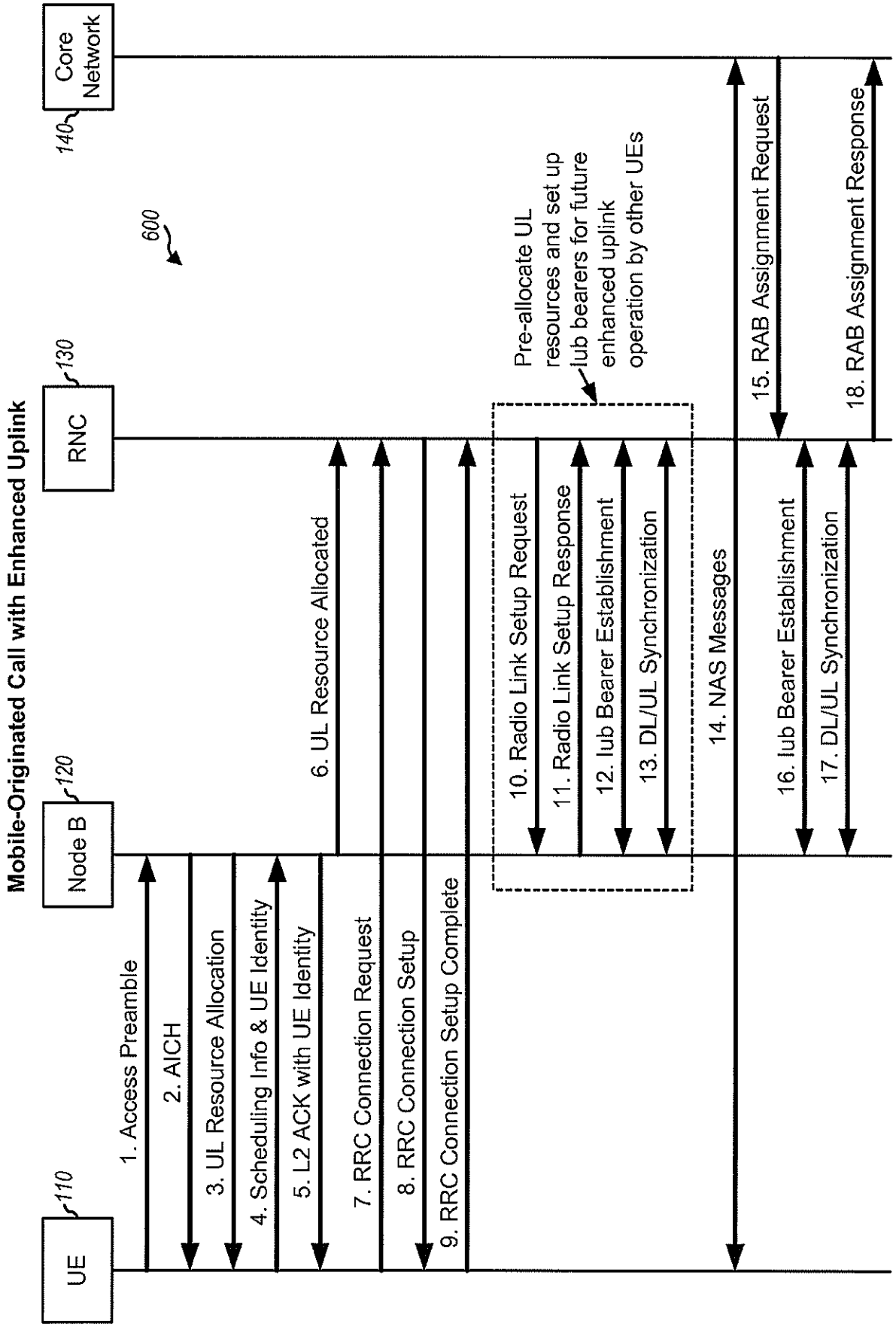

Mobile-Originated Call with Enhanced Uplink
UE
110
Node B
120
RNC
130
Core Network
140
600
1. Access Preamble
2. AICH
3. UL Resource Allocation
4. Scheduling Info & UE Identity
5. L2 ACK with UE Identity
6. UL Resource Allocated
7. RRC Connection Request
8. RRC Connection Setup
9. RRC Connection Setup Complete
Pre-allocate UL resources and set up Iub bearers for future enhanced uplink operation by other UEs
10. Radio Link Setup Request
11. Radio Link Setup Response
12. Iub Bearer Establishment
13. DL/UL Synchronization
14. NAS Messages
15. RAB Assignment Request
16. Iub Bearer Establishment
17. DL/UL Synchronization
18. RAB Assignment Response

FIG. 6

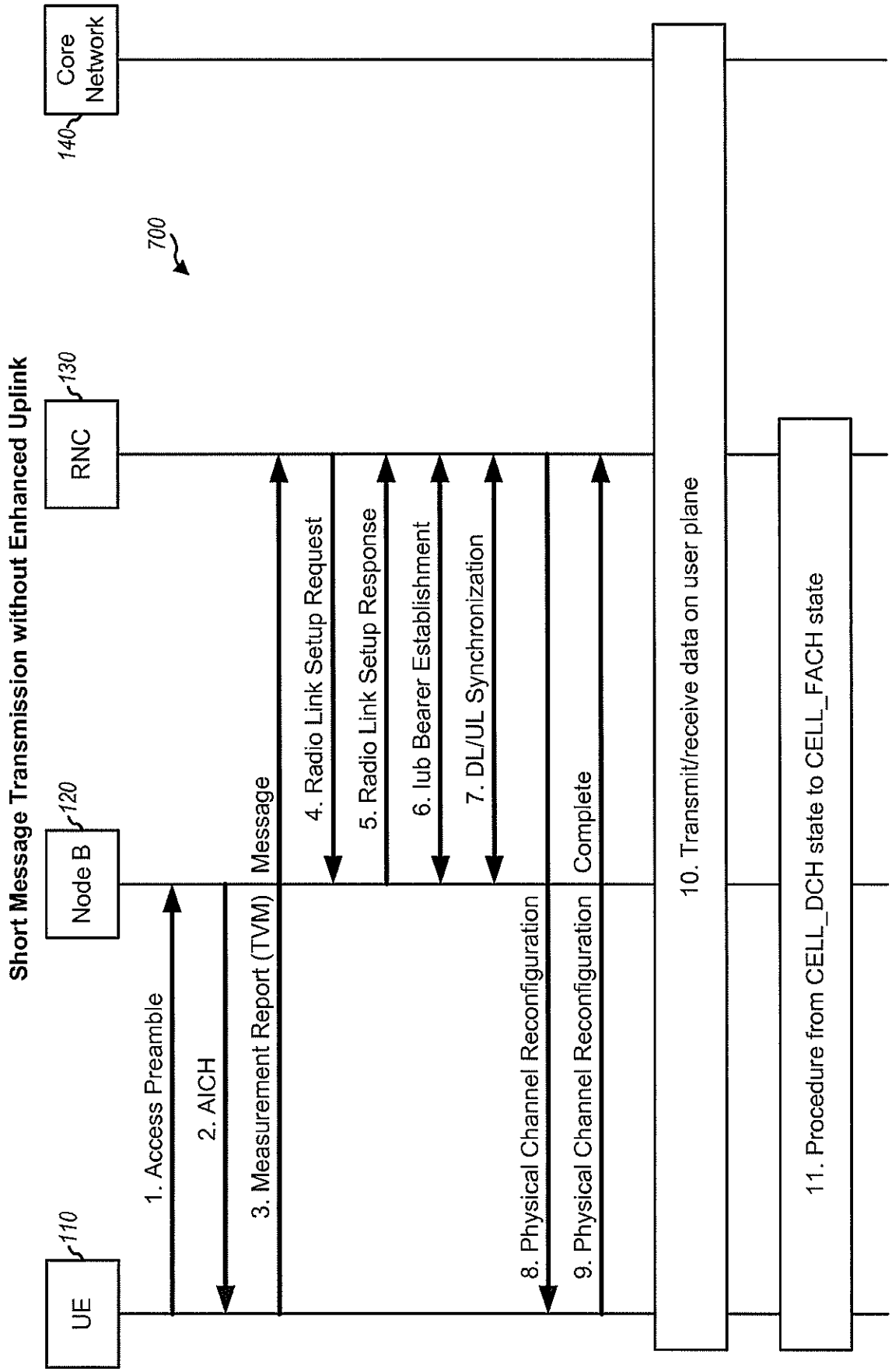

Short Message Transmission without Enhanced Uplink
UE
110
Node B
120
RNC
130
Core Network
140
700
1. Access Preamble
2. AICH
3. Measurement Report (TVM) Message
4. Radio Link Setup Request
5. Radio Link Setup Response
6. Iub Bearer Establishment
7. DL/UL Synchronization
8. Physical Channel Reconfiguration
9. Physical Channel Reconfiguration Complete
10. Transmit/receive data on user plane
11. Procedure from CELL_DCH state to CELL_FACH state

FIG. 7

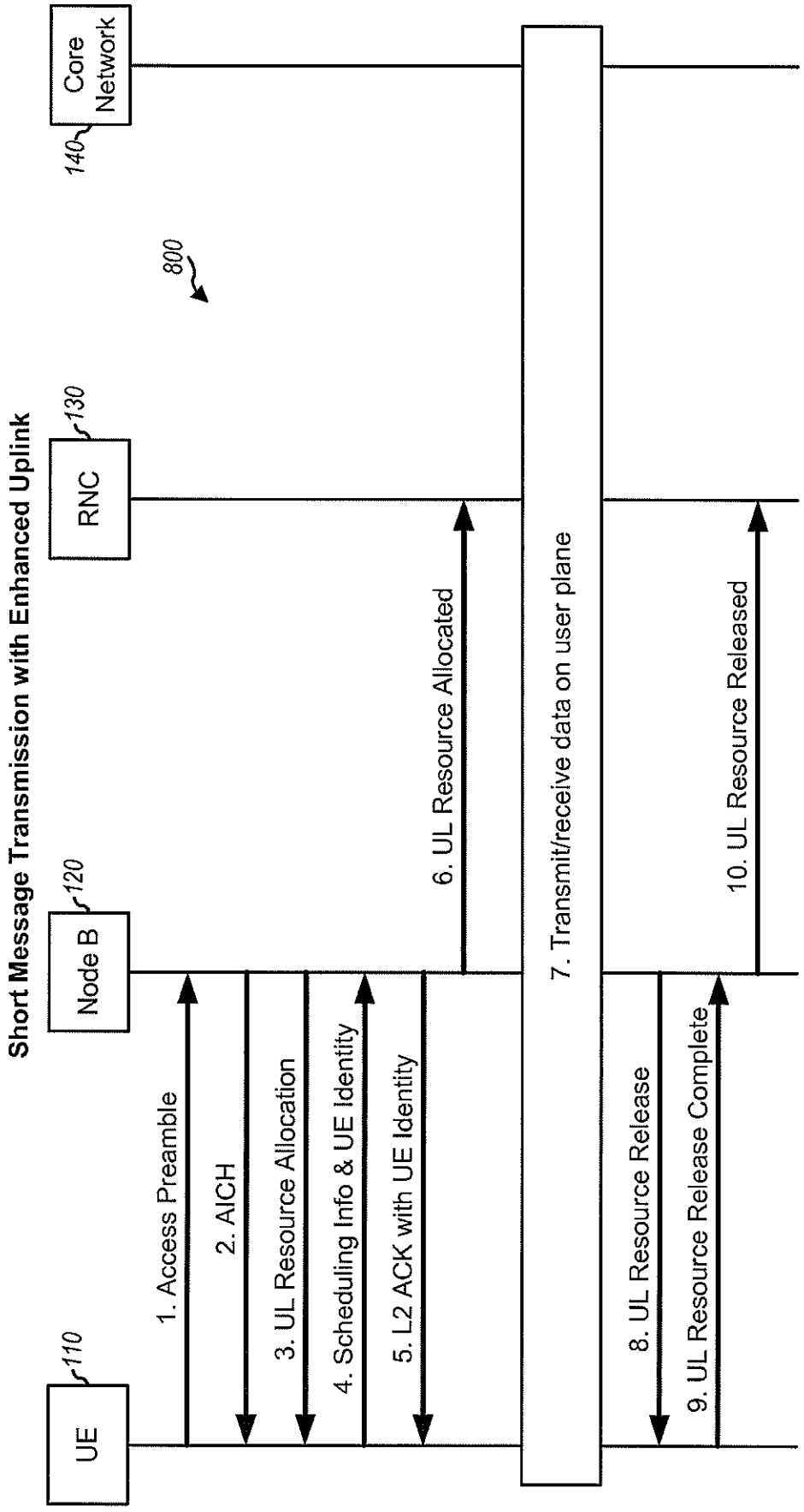

Short Message Transmission with Enhanced Uplink
UE
110
Node B
120
RNC
130
Core Network
140
800
1. Access Preamble
2. AICH
3. UL Resource Allocation
4. Scheduling Info & UE Identity
5. L2 ACK with UE Identity
6. UL Resource Allocated
7. Transmit/receive data on user plane
8. UL Resource Release
9. UL Resource Release Complete
10. UL Resource Released

FIG. 8

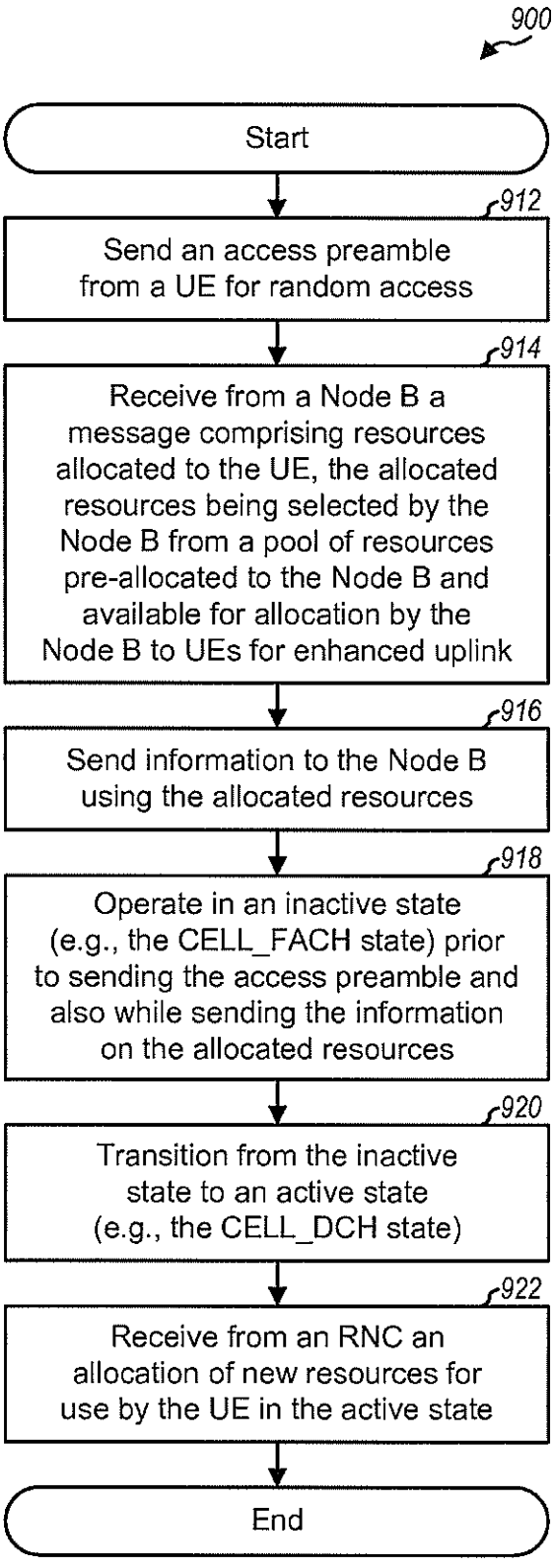

900
Start
912
Send an access preamble from a UE for random access
914
Receive from a Node B a message comprising resources allocated to the UE, the allocated resources being selected by the Node B from a pool of resources pre-allocated to the Node B and available for allocation by the Node B to UEs for enhanced uplink
916
Send information to the Node B using the allocated resources
918
Operate in an inactive state (e.g., the CELL_FACH state) prior to sending the access preamble and also while sending the information on the allocated resources
920
Transition from the inactive state to an active state (e.g., the CELL_DCH state)
922
Receive from an RNC an allocation of new resources for use by the UE in the active state
End

FIG. 9

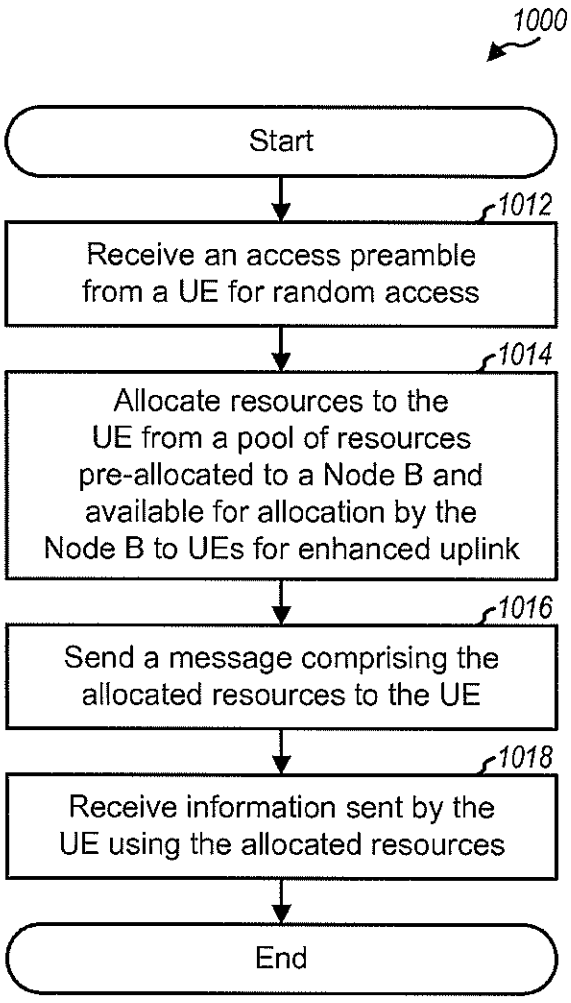

1000
Start
1012
Receive an access preamble from a UE for random access
1014
Allocate resources to the UE from a pool of resources pre-allocated to a Node B and available for allocation by the Node B to UEs for enhanced uplink
1016
Send a message comprising the allocated resources to the UE
1018
Receive information sent by the UE using the allocated resources
End

FIG. 10

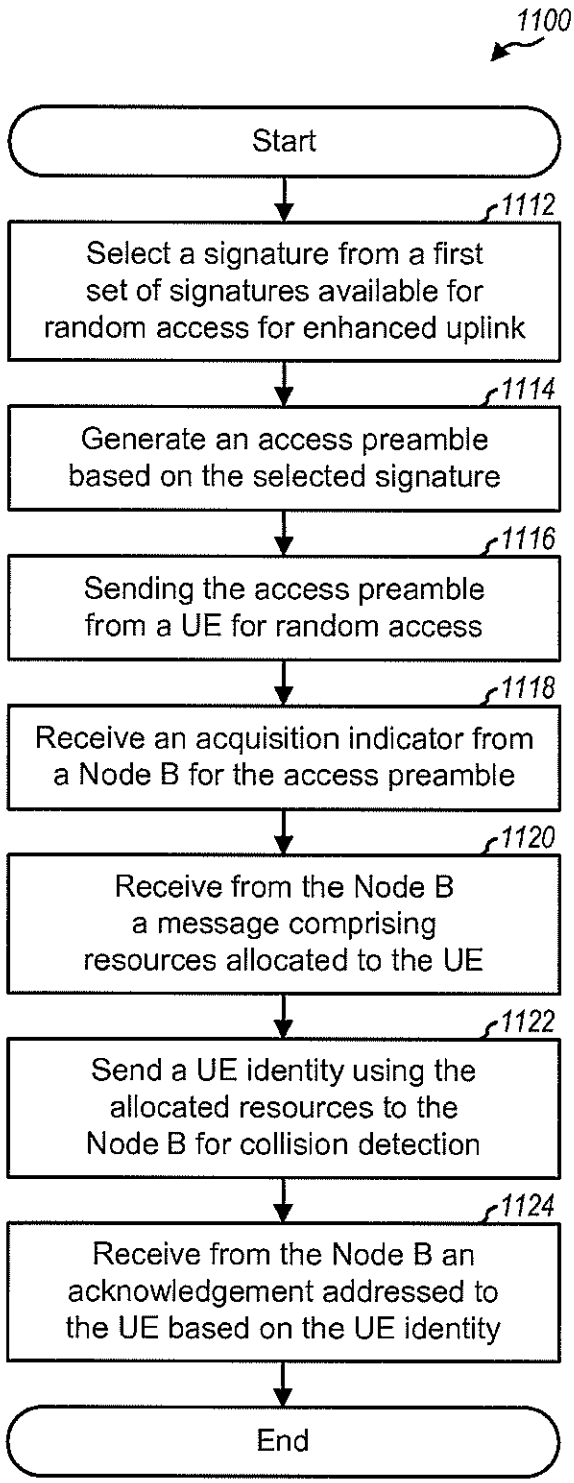

1100
Start
1112
Select a signature from a first set of signatures available for random access for enhanced uplink
1114
Generate an access preamble based on the selected signature
1116
Sending the access preamble from a UE for random access
1118
Receive an acquisition indicator from a Node B for the access preamble
1120
Receive from the Node B a message comprising resources allocated to the UE
1122
Send a UE identity using the allocated resources to the Node B for collision detection
1124
Receive from the Node B an acknowledgement addressed to the UE based on the UE identity
End

FIG. 11

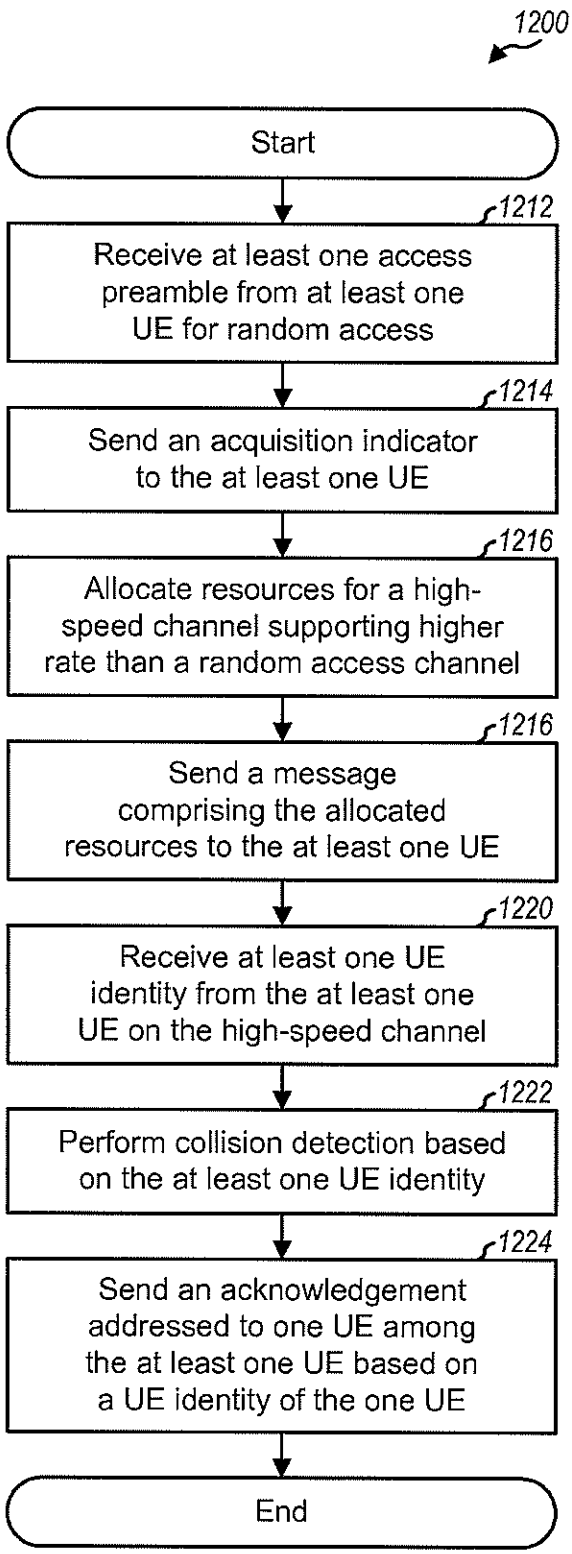

1200
Start
1212
Receive at least one access preamble from at least one UE for random access
1214
Send an acquisition indicator to the at least one UE
1216
Allocate resources for a high-speed channel supporting higher rate than a random access channel
1216
Send a message comprising the allocated resources to the at least one UE
1220
Receive at least one UE identity from the at least one UE on the high-speed channel
1222
Perform collision detection based on the at least one UE identity
1224
Send an acknowledgement addressed to one UE among the at least one UE based on a UE identity of the one UE
End

FIG. 12

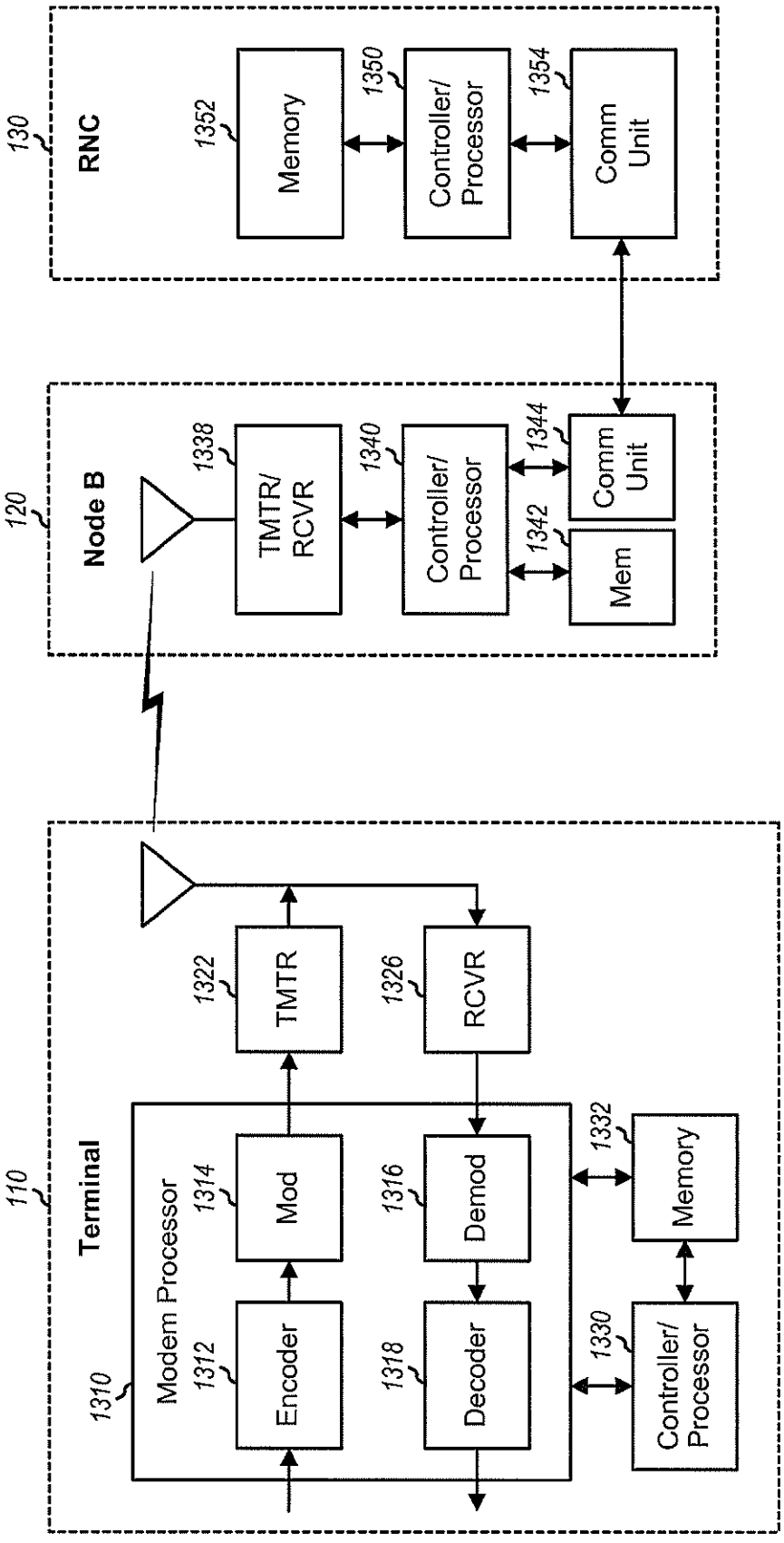

130
RNC
1352
Memory
1350
Controller/
Processor
1354
Comm
Unit
120
Node B
1338
TMTR/
RCVR
1340
Controller/
Processor
1344
Comm
Unit
1342
Mem
110
Terminal
1322
TMTR
1326
RCVR
1310
Modem Processor
1312
Encoder
1314
Mod
1316
Demod
1318
Decoder
1332
Memory
1330
Controller/
Processor

FIG. 13