FIG. 1

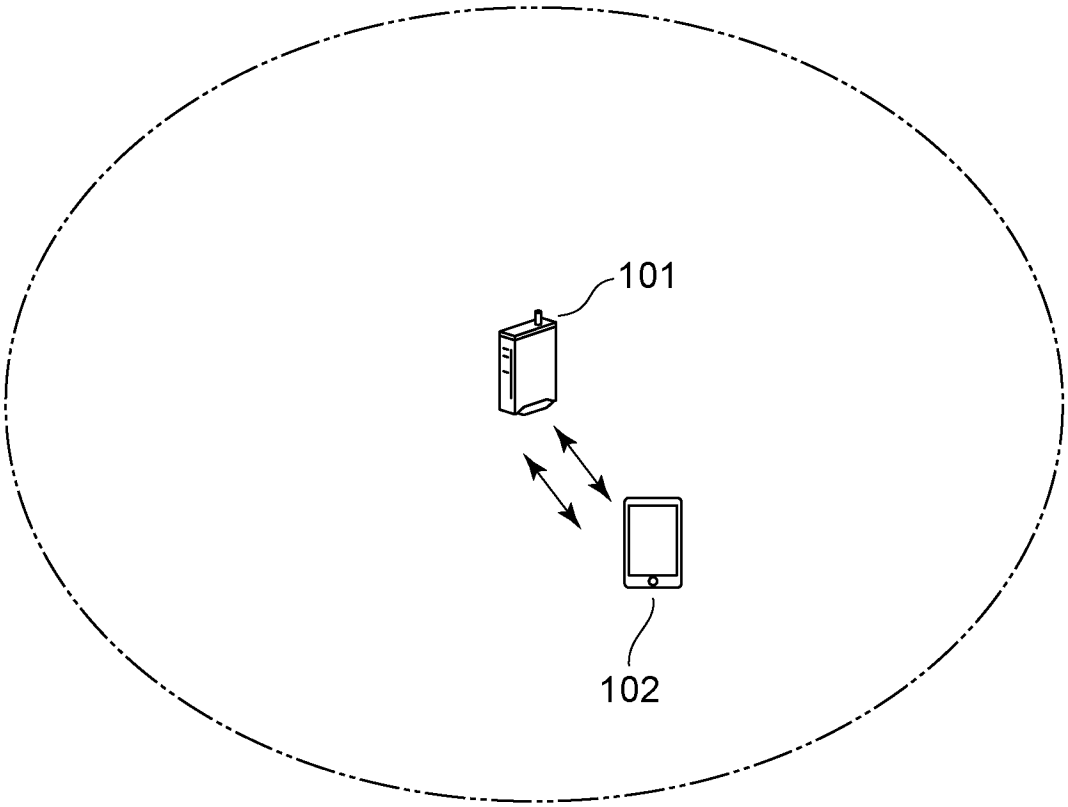


FIG. 2

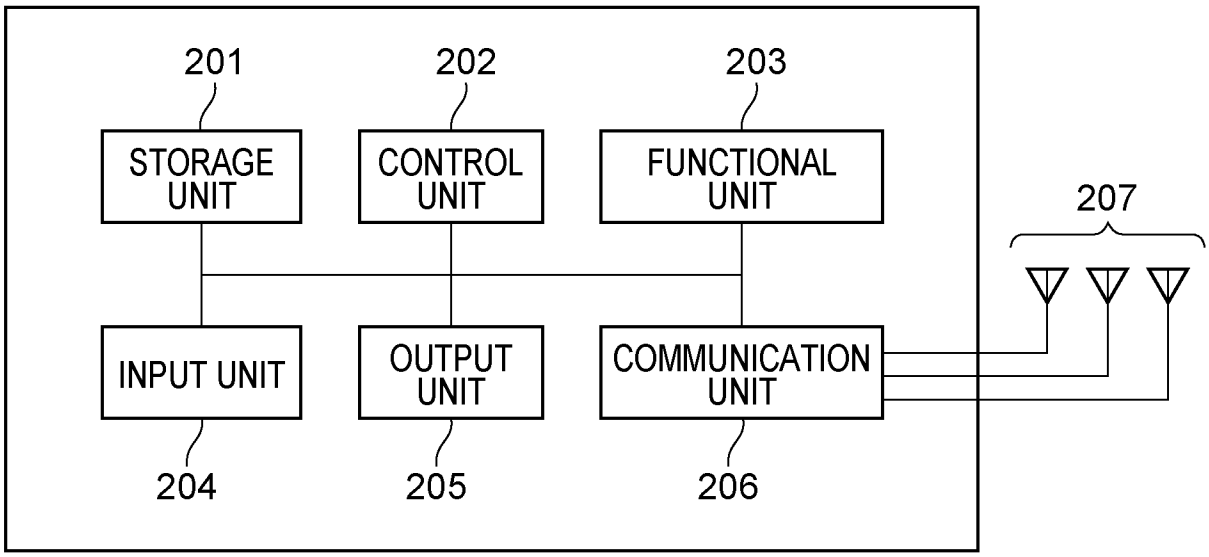

201
202
203
STORAGE UNIT
CONTROL UNIT
FUNCTIONAL UNIT
207
INPUT UNIT
OUTPUT UNIT
COMMUNICATION UNIT
204
205
206

FIG. 3

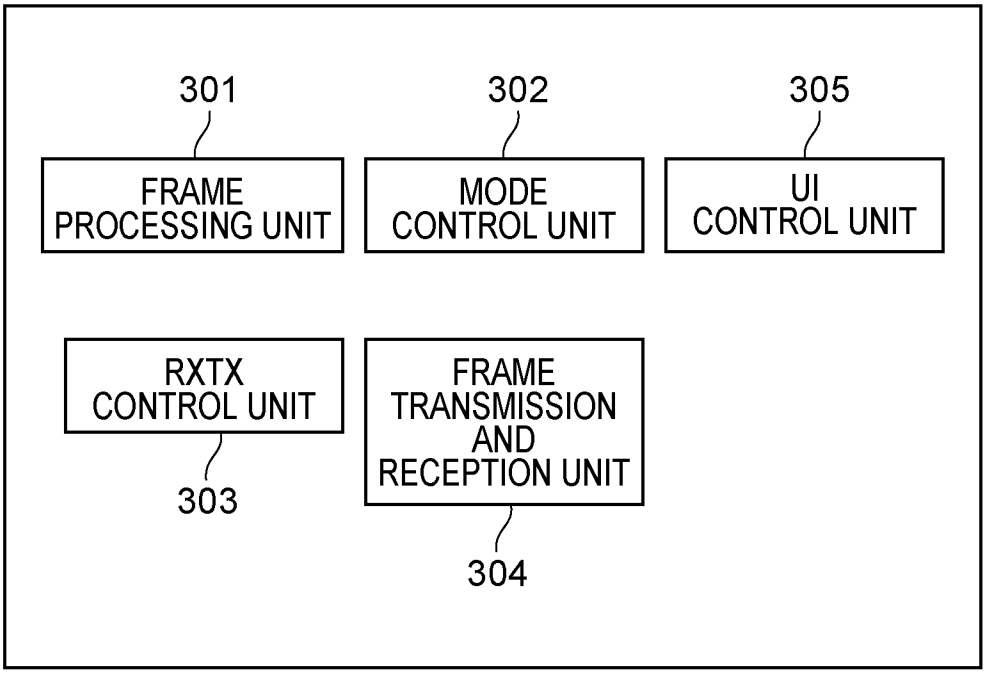

301
FRAME PROCESSING UNIT
302
MODE CONTROL UNIT
305
UI CONTROL UNIT
RXTX CONTROL UNIT
303
FRAME TRANSMISSION AND RECEPTION UNIT
304

FIG. 4

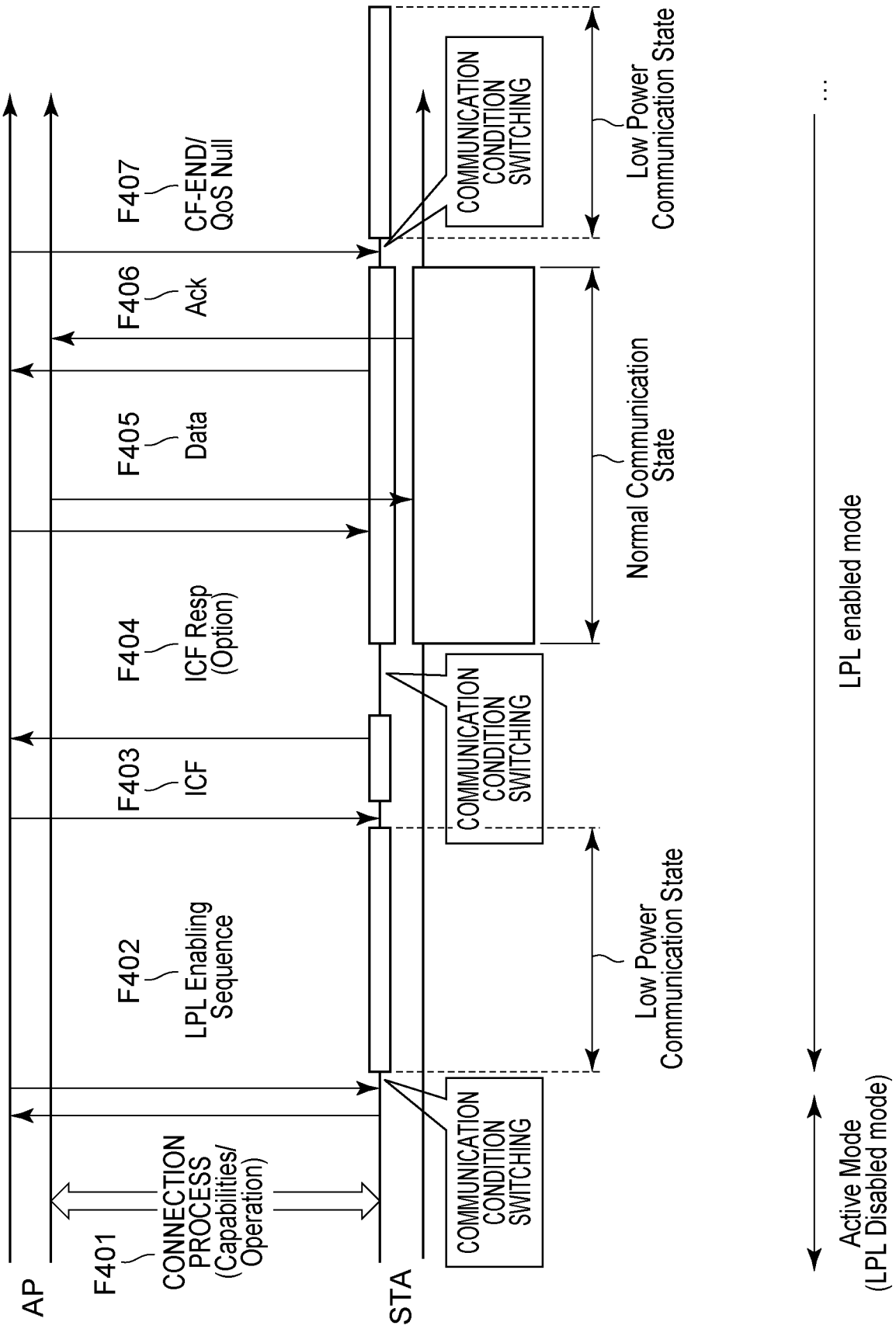

AP
STA
F401
CONNECTION PROCESS (Capabilities/ Operation)
F402
LPL Enabling Sequence
F403
ICF
F404
ICF Resp (Option)
F405
Data
F406
Ack
F407
CF-END/ QoS Null
COMMUNICATION CONDITION SWITCHING
COMMUNICATION CONDITION SWITCHING
COMMUNICATION CONDITION SWITCHING
Low Power Communication State
Normal Communication State
Low Power Communication State
LPL enabled mode
Active Mode (LPL Disabled mode)

FIG. 5A

UHR capabilities Element

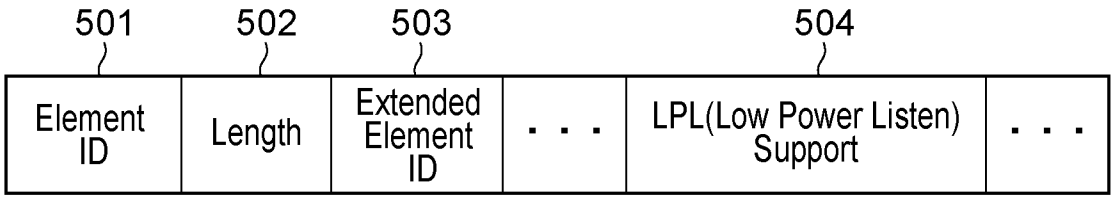


FIG. 5B

MODIFICATION OF UHR capabilities Element

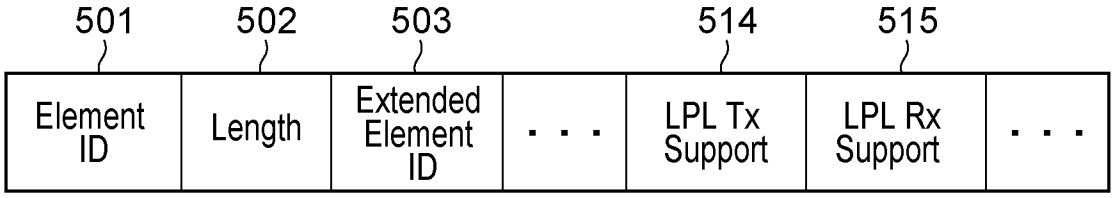


FIG. 6

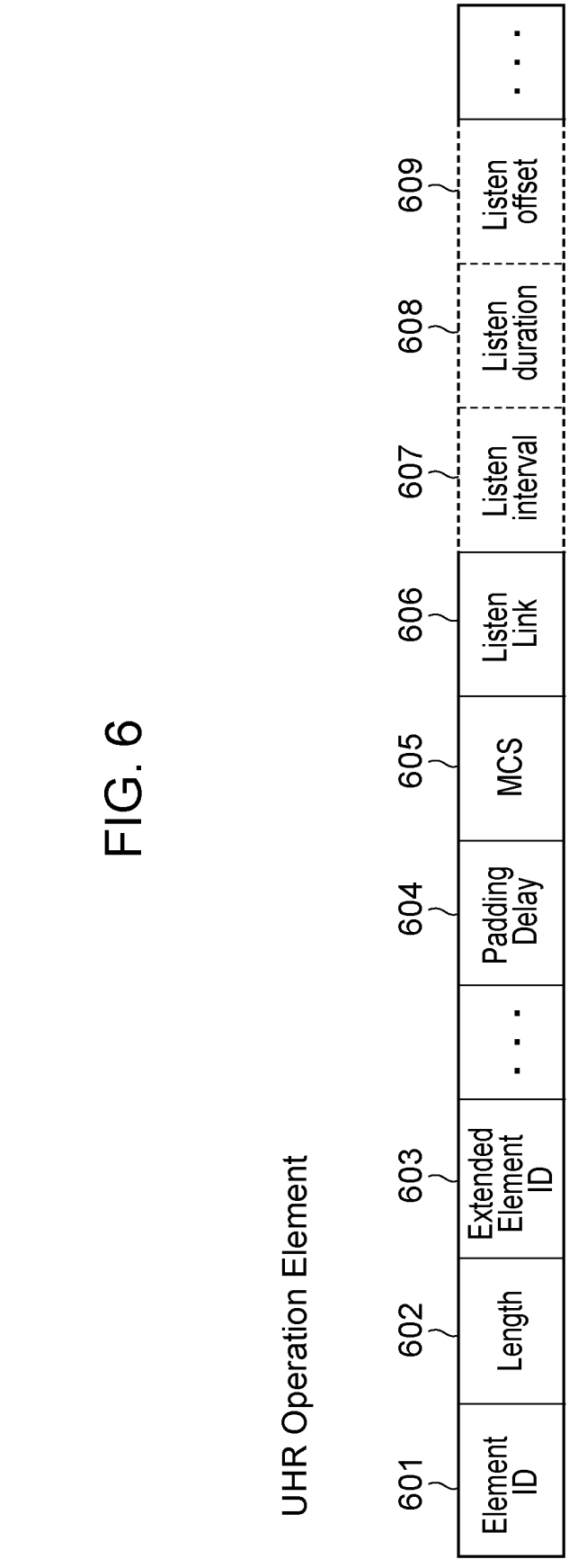

UHR Operation Element
601
Element ID
602
Length
603
Extended Element ID
. . .
604
Padding Delay
605
MCS
606
Listen Link
607
Listen interval
608
Listen duration
609
Listen offset
. . .

FIG. 7

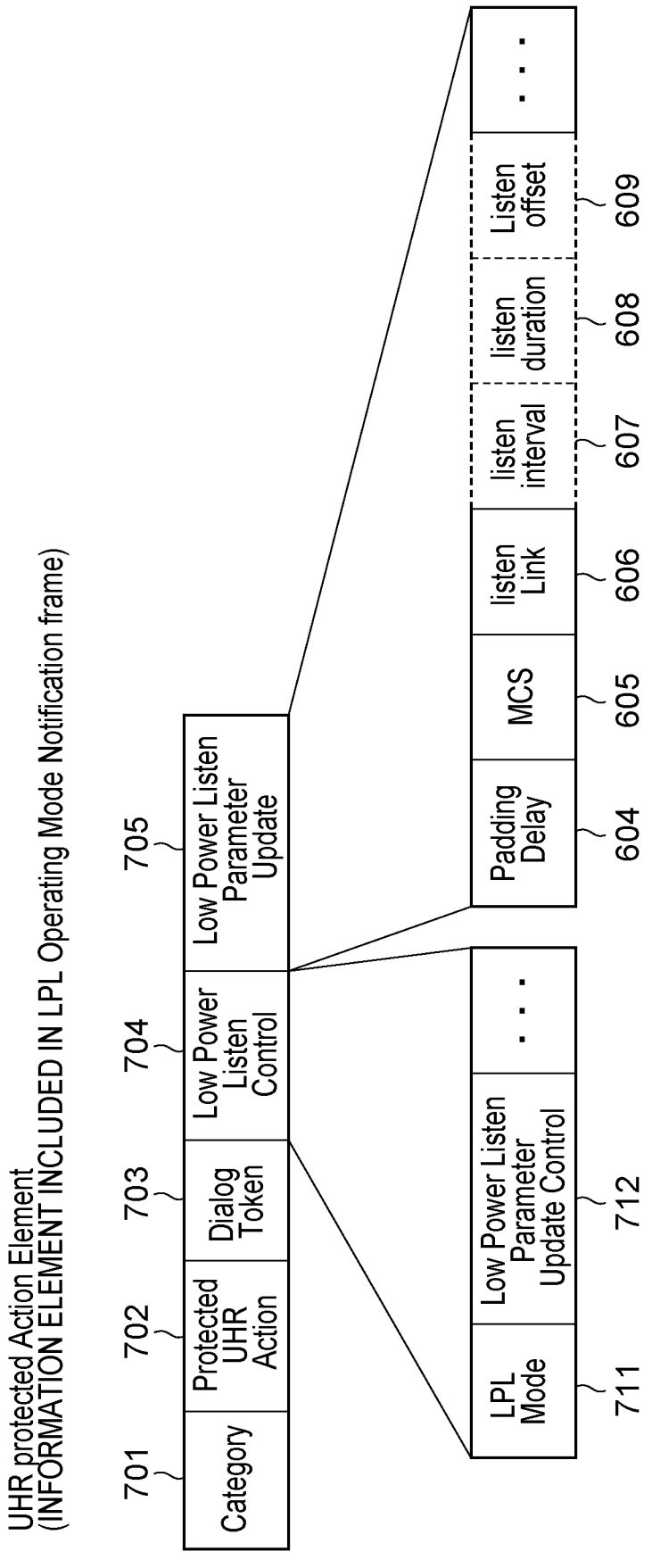

UHR protected Action Element
(INFORMATION ELEMENT INCLUDED IN LPL Operating Mode Notification frame)
Category
Protected UHR Action
Dialog Token
Low Power Listen Control
Low Power Listen Parameter Update
701
702
703
704
705
LPL Mode
Low Power Listen Parameter Update Control
. . .
Padding Delay
MCS
listen Link
listen interval
listen duration
Listen offset
. . .
711
712
604
605
606
607
608
609

FIG. 8

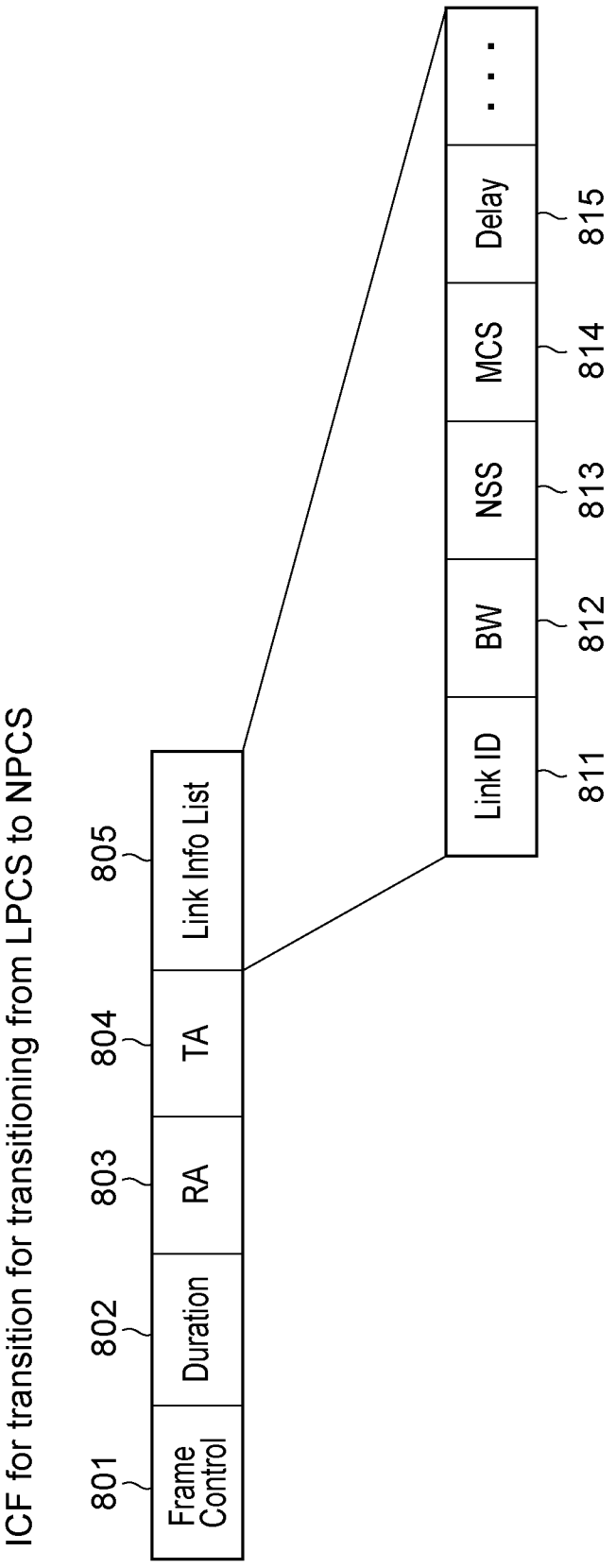

ICF for transition for transitioning from LPCS to NPCS
801
Frame Control
802
Duration
803
RA
804
TA
805
Link Info List
Link ID
811
BW
812
NSS
813
MCS
814
Delay
815
. . .

FIG. 9

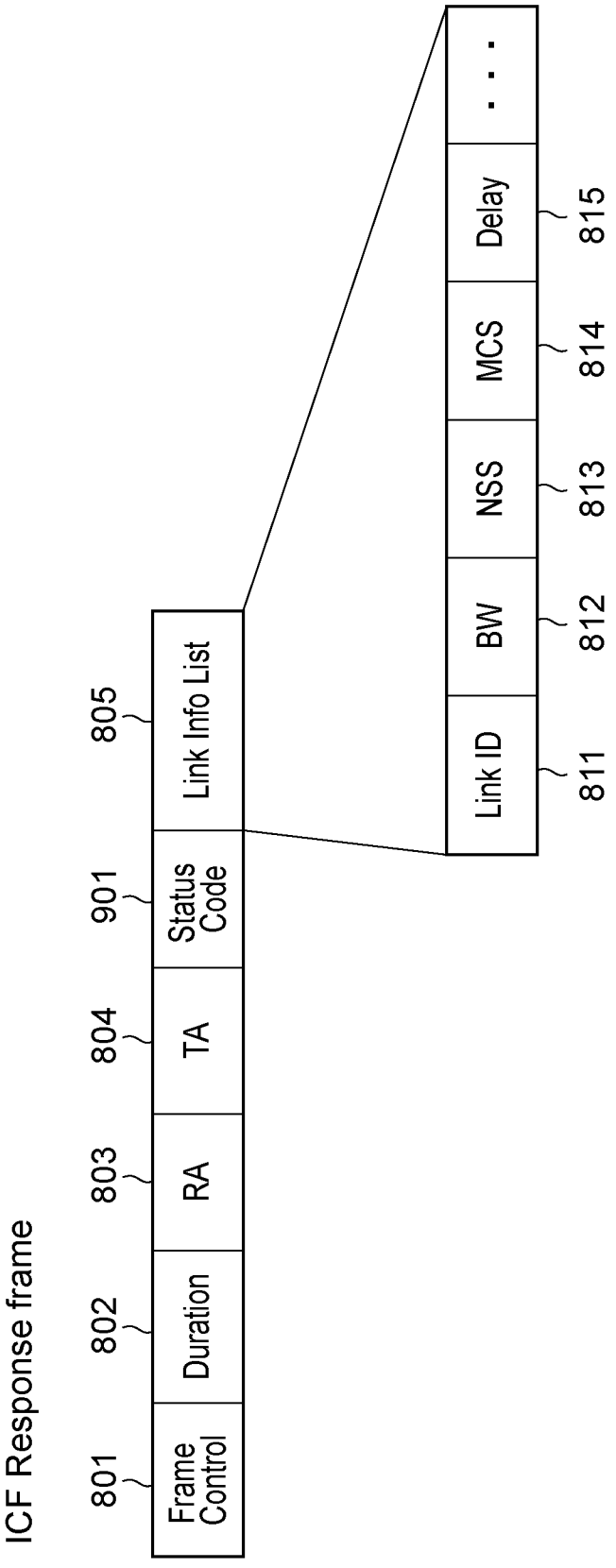

ICF Response frame
801
Frame Control
802
Duration
803
RA
804
TA
901
Status Code
805
Link Info List
Link ID
BW
NSS
MCS
Delay
. . .
811
812
813
814
815

FIG. 10

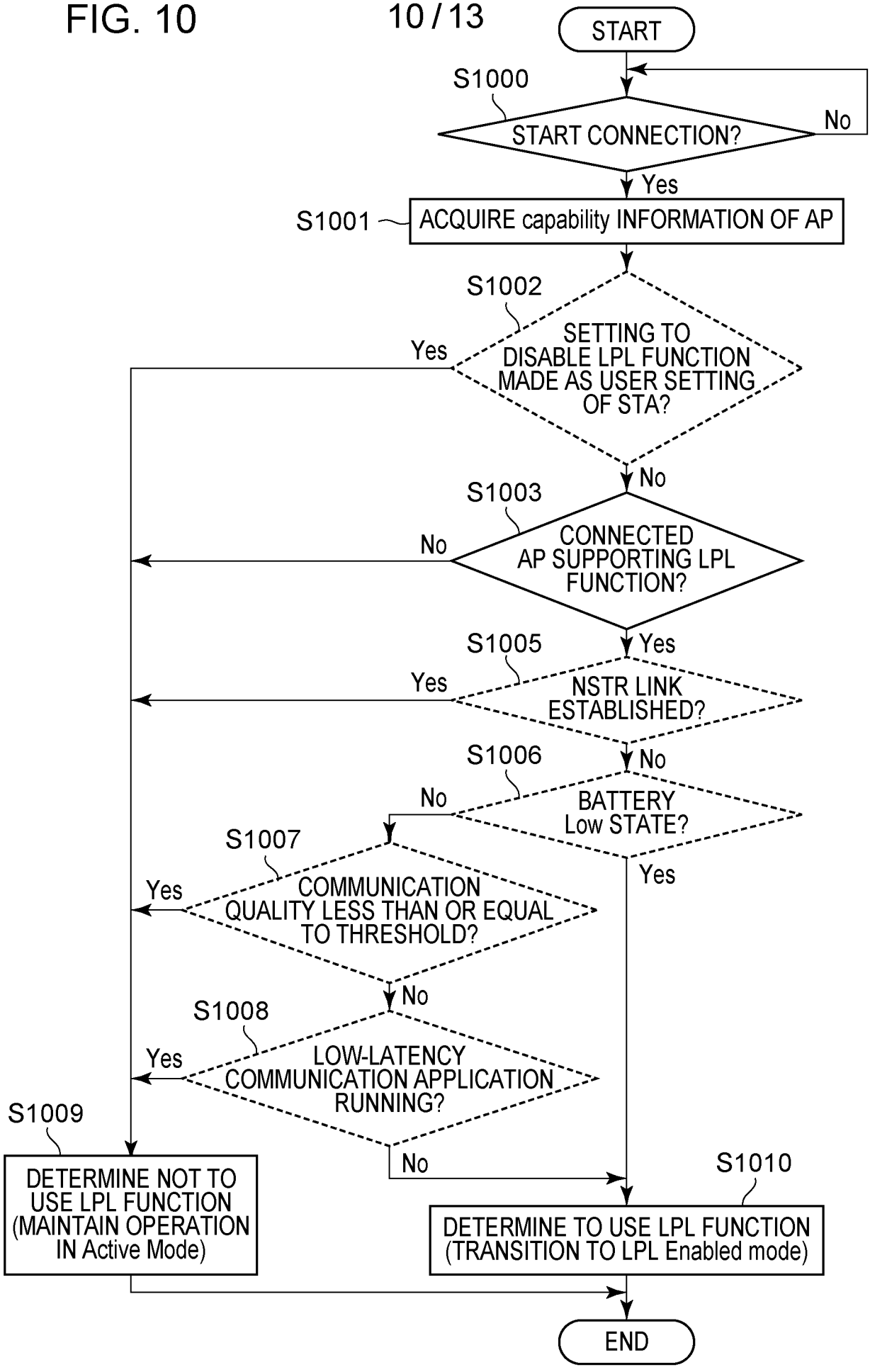

START
S1000
START CONNECTION?
No
Yes
S1001
ACQUIRE capability INFORMATION OF AP
S1002
SETTING TO DISABLE LPL FUNCTION MADE AS USER SETTING OF STA?
Yes
No
S1003
CONNECTED AP SUPPORTING LPL FUNCTION?
No
Yes
S1005
NSTR LINK ESTABLISHED?
Yes
No
S1006
BATTERY Low STATE?
No
Yes
S1007
COMMUNICATION QUALITY LESS THAN OR EQUAL TO THRESHOLD?
Yes
No
S1008
LOW-LATENCY COMMUNICATION APPLICATION RUNNING?
Yes
No
S1009
DETERMINE NOT TO USE LPL FUNCTION (MAINTAIN OPERATION IN Active Mode)
S1010
DETERMINE TO USE LPL FUNCTION (TRANSITION TO LPL Enabled mode)
END

FIG. 11

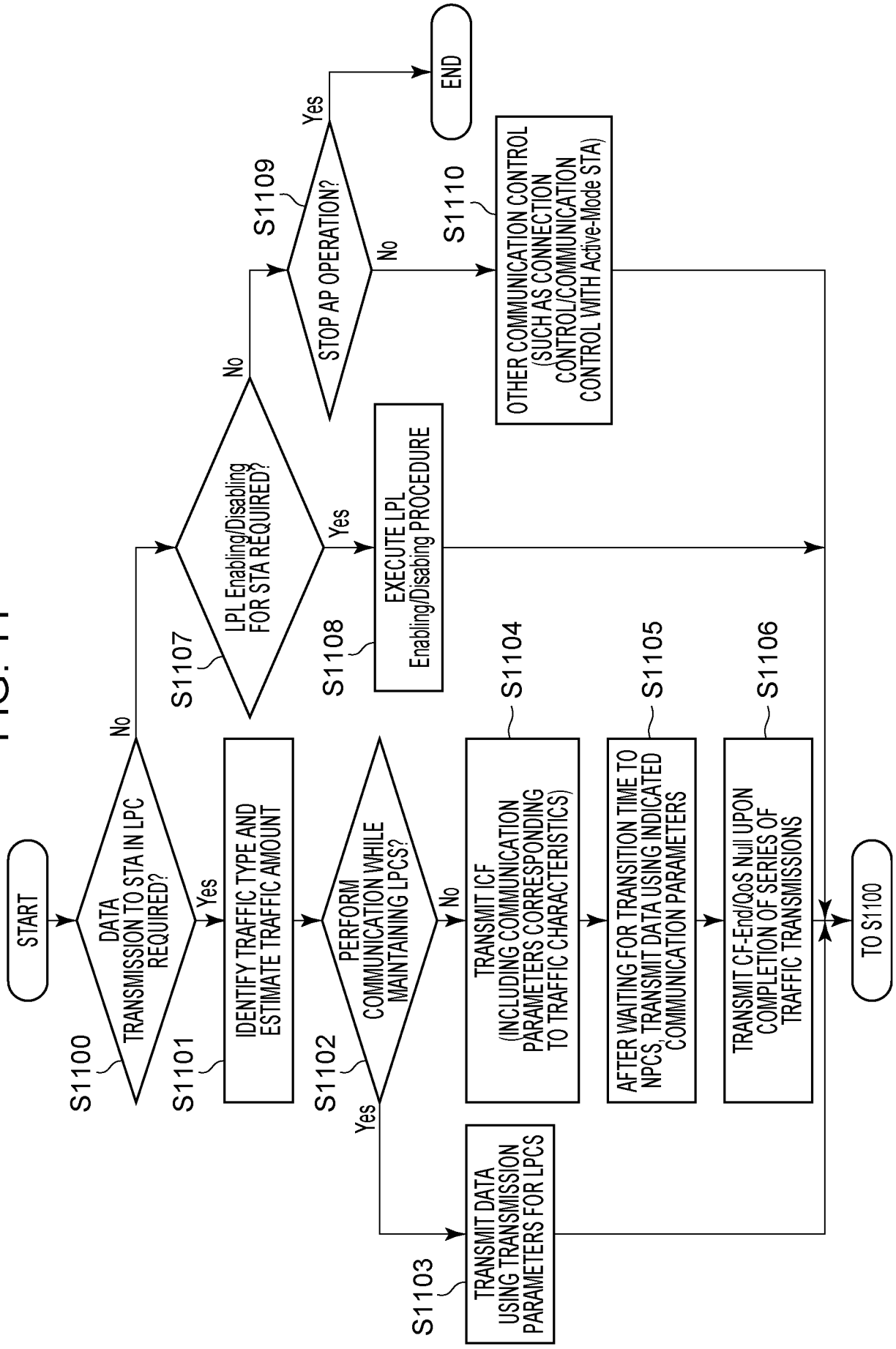

START
S1100
DATA TRANSMISSION TO STA IN LPC REQUIRED?
No
Yes
S1101
IDENTIFY TRAFFIC TYPE AND ESTIMATE TRAFFIC AMOUNT
S1102
PERFORM COMMUNICATION WHILE MAINTAINING LPCS?
No
Yes
S1103
TRANSMIT DATA USING TRANSMISSION PARAMETERS FOR LPCS
S1104
TRANSMIT ICF (INCLUDING COMMUNICATION PARAMETERS CORRESPONDING TO TRAFFIC CHARACTERISTICS)
S1105
AFTER WAITING FOR TRANSITION TIME TO NPCS, TRANSMIT DATA USING INDICATED COMMUNICATION PARAMETERS
S1106
TRANSMIT CF-End/QoS Null UPON COMPLETION OF SERIES OF TRAFFIC TRANSMISSIONS
TO S1100
S1107
LPL Enabling/Disabling FOR STA REQUIRED?
No
Yes
S1108
EXECUTE LPL Enabling/Disabing PROCEDURE
S1109
STOP AP OPERATION?
Yes
No
END
S1110
OTHER COMMUNICATION CONTROL (SUCH AS CONNECTION CONTROL/COMMUNICATION CONTROL WITH Active-Mode STA)

FIG. 12

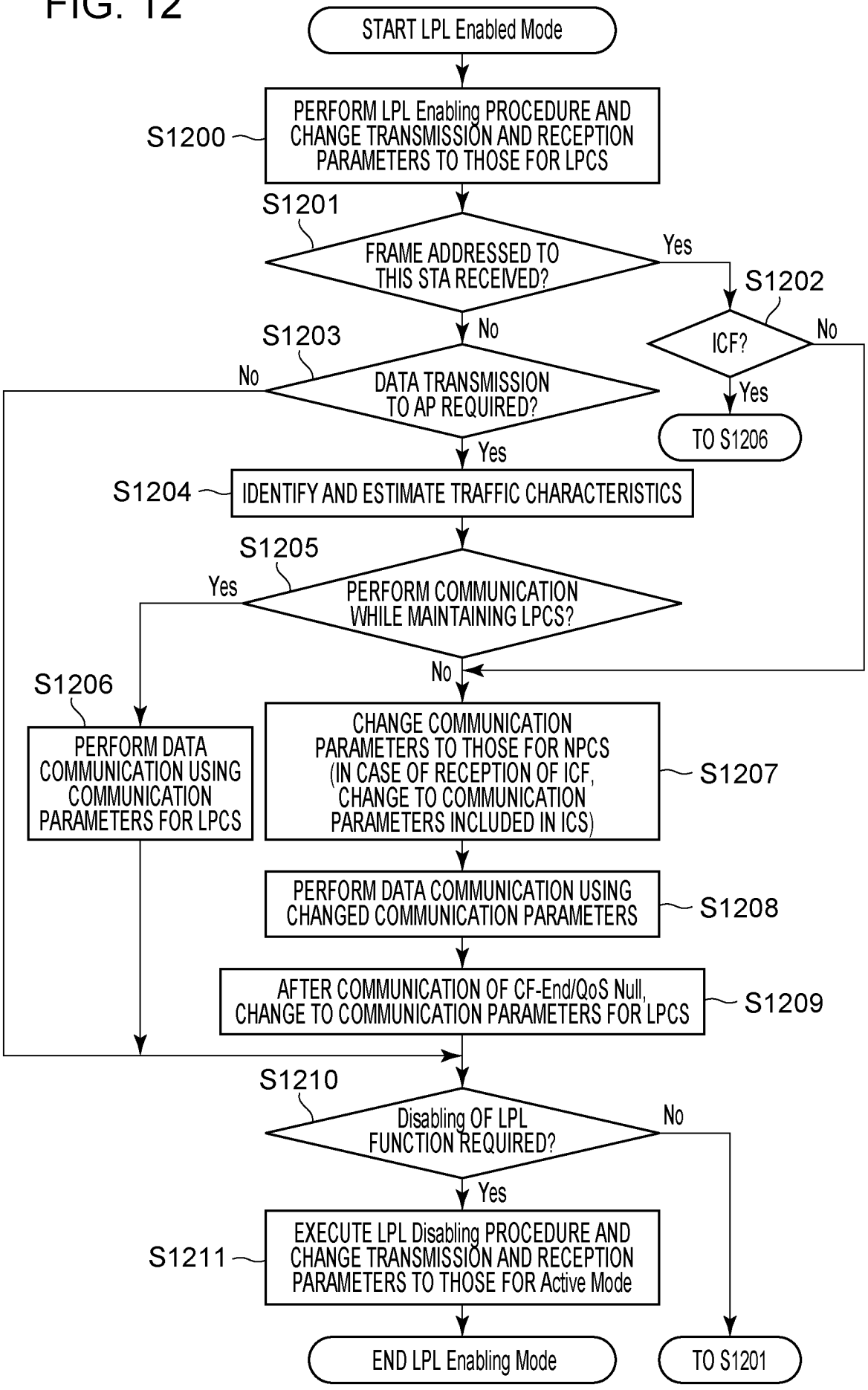
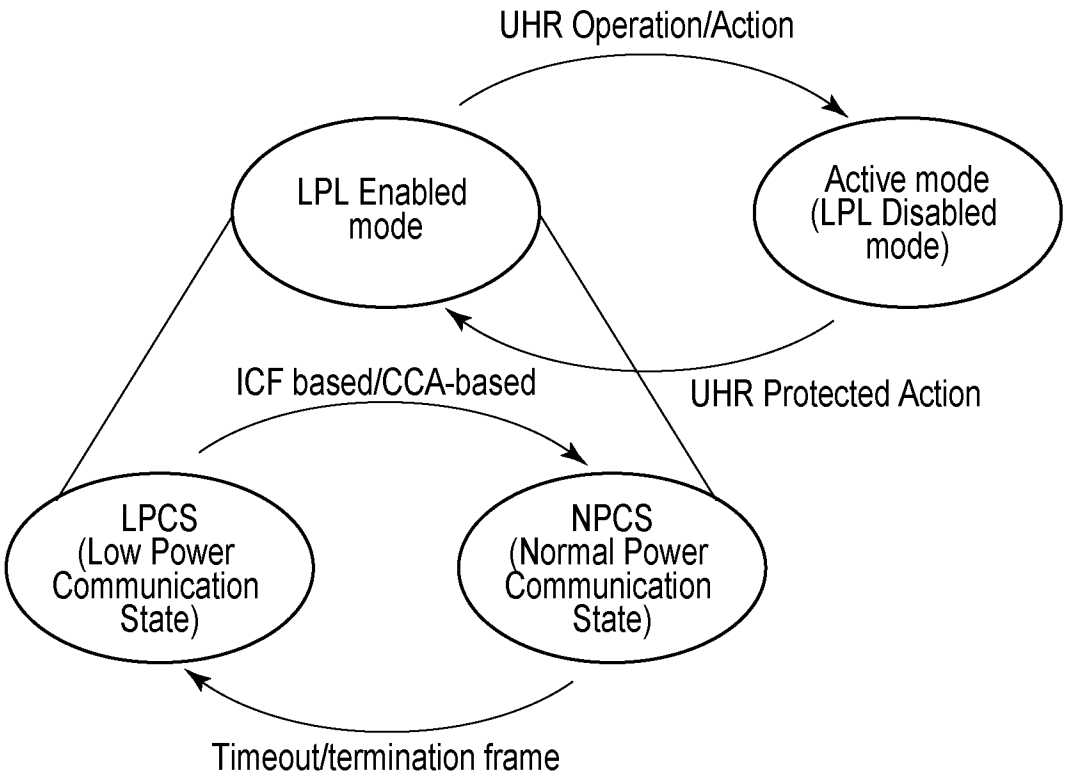

START LPL Enabled Mode
S1200
PERFORM LPL Enabling PROCEDURE AND CHANGE TRANSMISSION AND RECEPTION PARAMETERS TO THOSE FOR LPCS
S1201
FRAME ADDRESSED TO THIS STA RECEIVED?
Yes
No
S1202
ICF?
No
Yes
TO S1206
S1203
DATA TRANSMISSION TO AP REQUIRED?
No
Yes
S1204
IDENTIFY AND ESTIMATE TRAFFIC CHARACTERISTICS
S1205
PERFORM COMMUNICATION WHILE MAINTAINING LPCS?
Yes
No
S1206
PERFORM DATA COMMUNICATION USING COMMUNICATION PARAMETERS FOR LPCS
CHANGE COMMUNICATION PARAMETERS TO THOSE FOR NPCS (IN CASE OF RECEPTION OF ICF, CHANGE TO COMMUNICATION PARAMETERS INCLUDED IN ICS)
S1207
PERFORM DATA COMMUNICATION USING CHANGED COMMUNICATION PARAMETERS
S1208
AFTER COMMUNICATION OF CF-End/QoS Null, CHANGE TO COMMUNICATION PARAMETERS FOR LPCS
S1209
S1210
Disabling OF LPL FUNCTION REQUIRED?
No
Yes
S1211
EXECUTE LPL Disabling PROCEDURE AND CHANGE TRANSMISSION AND RECEPTION PARAMETERS TO THOSE FOR Active Mode
END LPL Enabling Mode
TO S1201

FIG. 13


UHR Operation/Action
LPL Enabled mode
Active mode (LPL Disabled mode)
ICF based/CCA-based
UHR Protected Action
LPCS (Low Power Communication State)
NPCS (Normal Power Communication State)
Timeout/termination frame