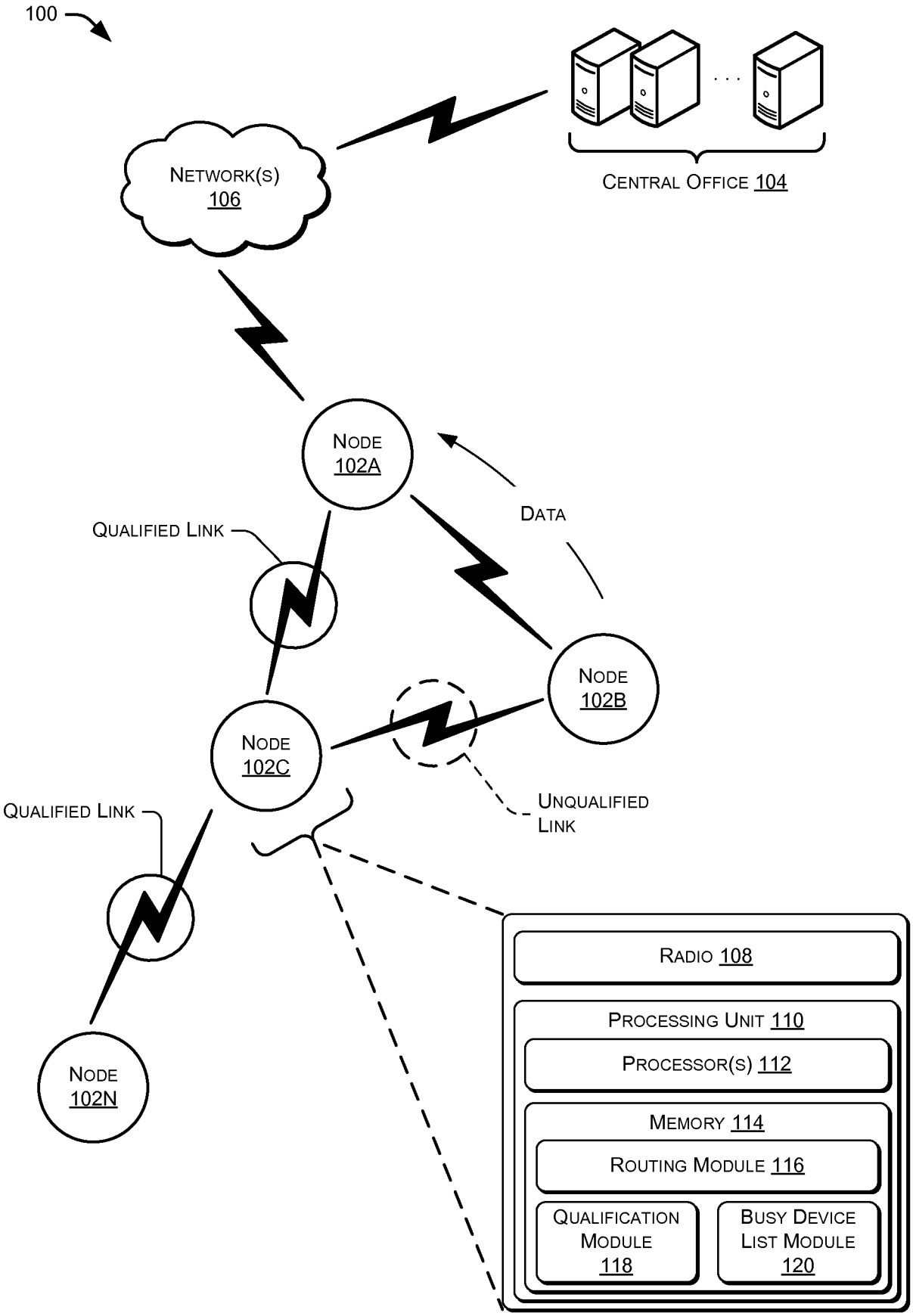

100
NETWORK(S) 106
CENTRAL OFFICE 104
NODE 102A
DATA
QUALIFIED LINK
NODE 102B
NODE 102C
UNQUALIFIED LINK
QUALIFIED LINK
NODE 102N
RADIO 108
PROCESSING UNIT 110
PROCESSOR(S) 112
MEMORY 114
ROUTING MODULE 116
QUALIFICATION MODULE 118
BUSY DEVICE LIST MODULE 120

FIG. 1

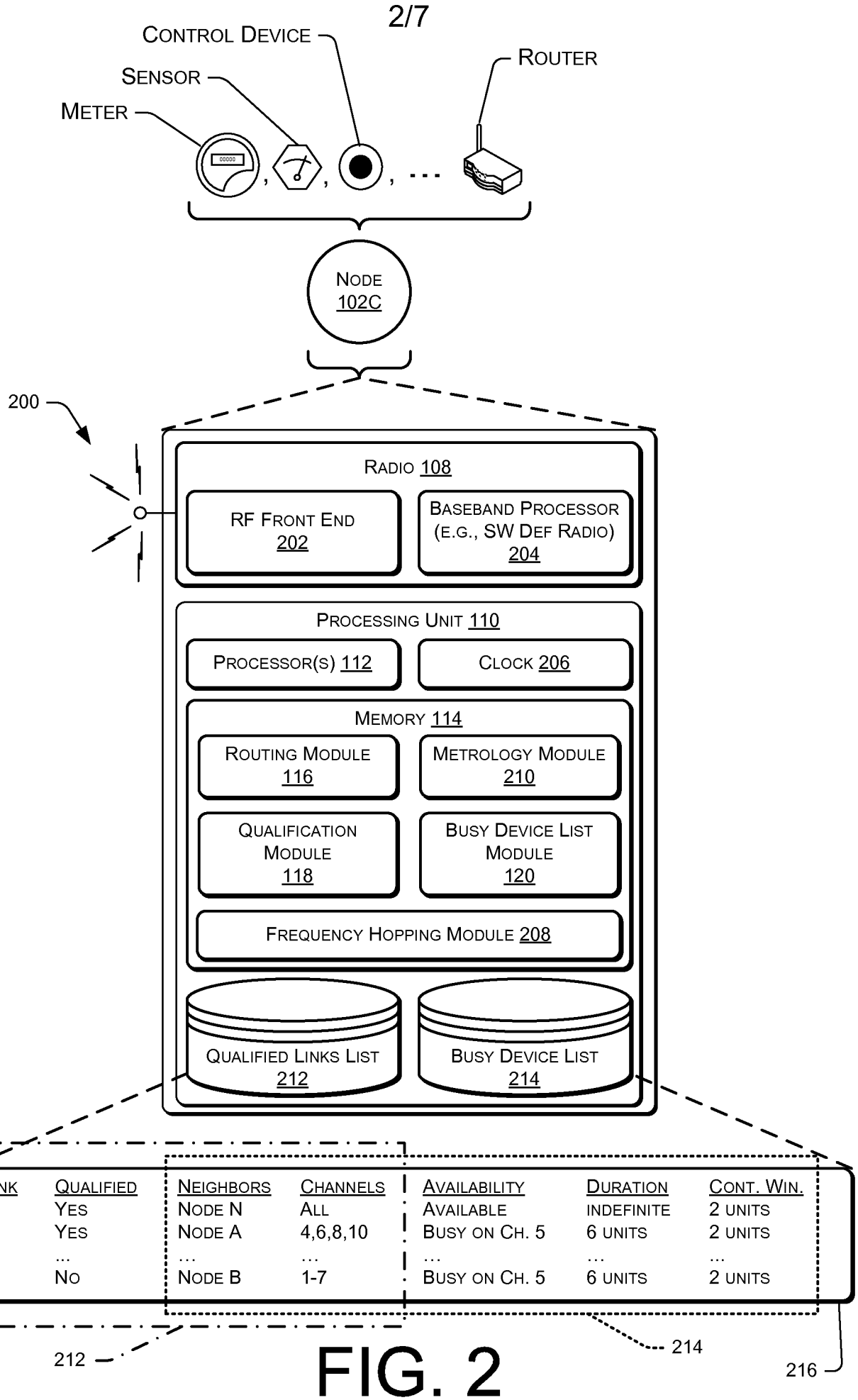

CONTROL DEVICE
SENSOR
METER
ROUTER
NODE 102C
200
RADIO 108
RF FRONT END 202
BASEBAND PROCESSOR (E.G., SW DEF RADIO) 204
PROCESSING UNIT 110
PROCESSOR(S) 112
CLOCK 206
MEMORY 114
ROUTING MODULE 116
METROLOGY MODULE 210
QUALIFICATION MODULE 118
BUSY DEVICE LIST MODULE 120
FREQUENCY HOPPING MODULE 208
QUALIFIED LINKS LIST 212
BUSY DEVICE LIST 214
RANK QUALIFIED NEIGHBORS CHANNELS AVAILABILITY DURATION CONT. WIN.
2 YES NODE N ALL AVAILABLE INDEFINITE 2 UNITS
1 YES NODE A 4,6,8,10 BUSY ON CH. 5 6 UNITS 2 UNITS
... ...
N NO NODE B 1-7 BUSY ON CH. 5 6 UNITS 2 UNITS
212
214
216

FIG. 2

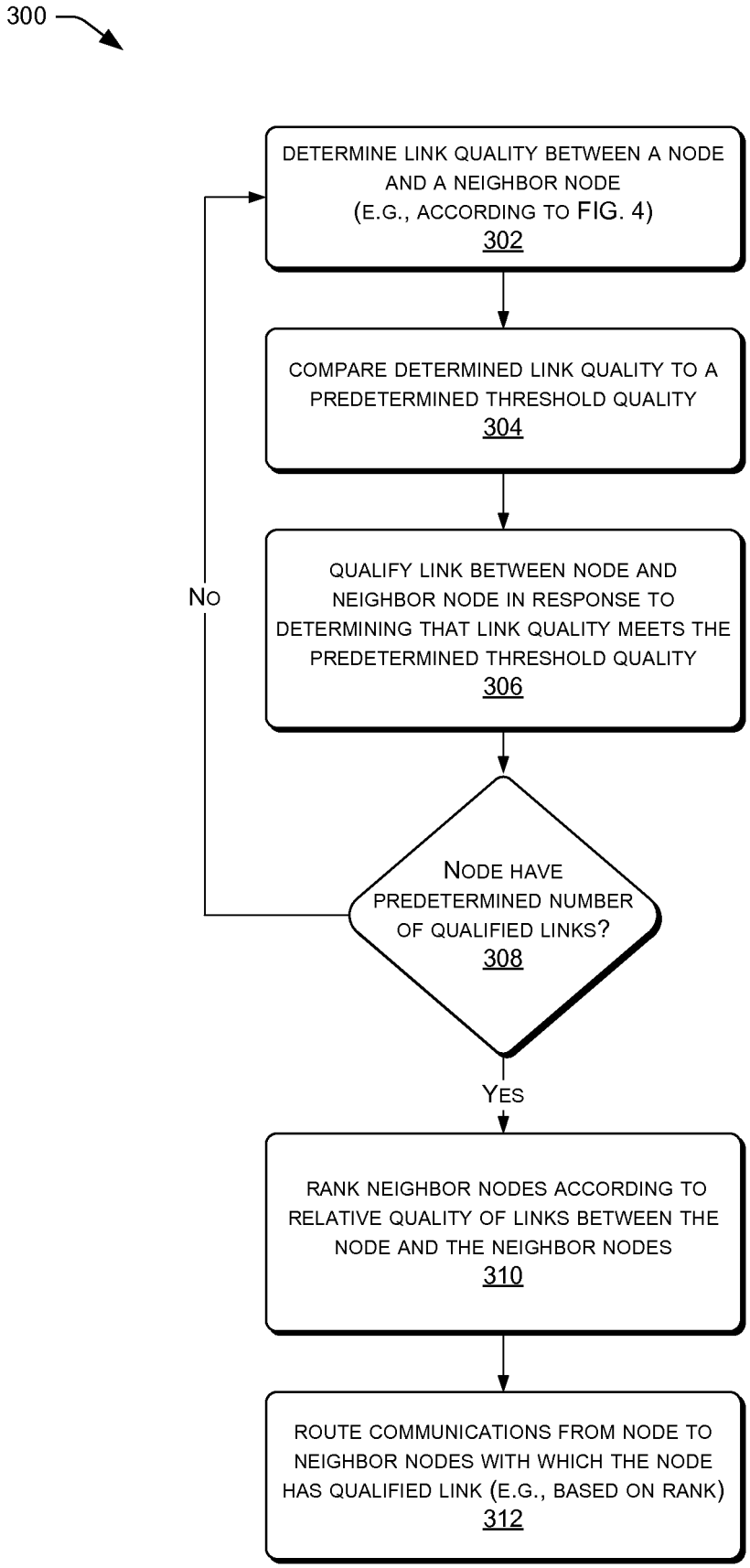

300
DETERMINE LINK QUALITY BETWEEN A NODE AND A NEIGHBOR NODE (E.G., ACCORDING TO FIG. 4)
302
COMPARE DETERMINED LINK QUALITY TO A PREDETERMINED THRESHOLD QUALITY
304
QUALIFY LINK BETWEEN NODE AND NEIGHBOR NODE IN RESPONSE TO DETERMINING THAT LINK QUALITY MEETS THE PREDETERMINED THRESHOLD QUALITY
306
NODE HAVE PREDETERMINED NUMBER OF QUALIFIED LINKS?
308
NO
YES
RANK NEIGHBOR NODES ACCORDING TO RELATIVE QUALITY OF LINKS BETWEEN THE NODE AND THE NEIGHBOR NODES
310
ROUTE COMMUNICATIONS FROM NODE TO NEIGHBOR NODES WITH WHICH THE NODE HAS QUALIFIED LINK (E.G., BASED ON RANK)
312

FIG. 3

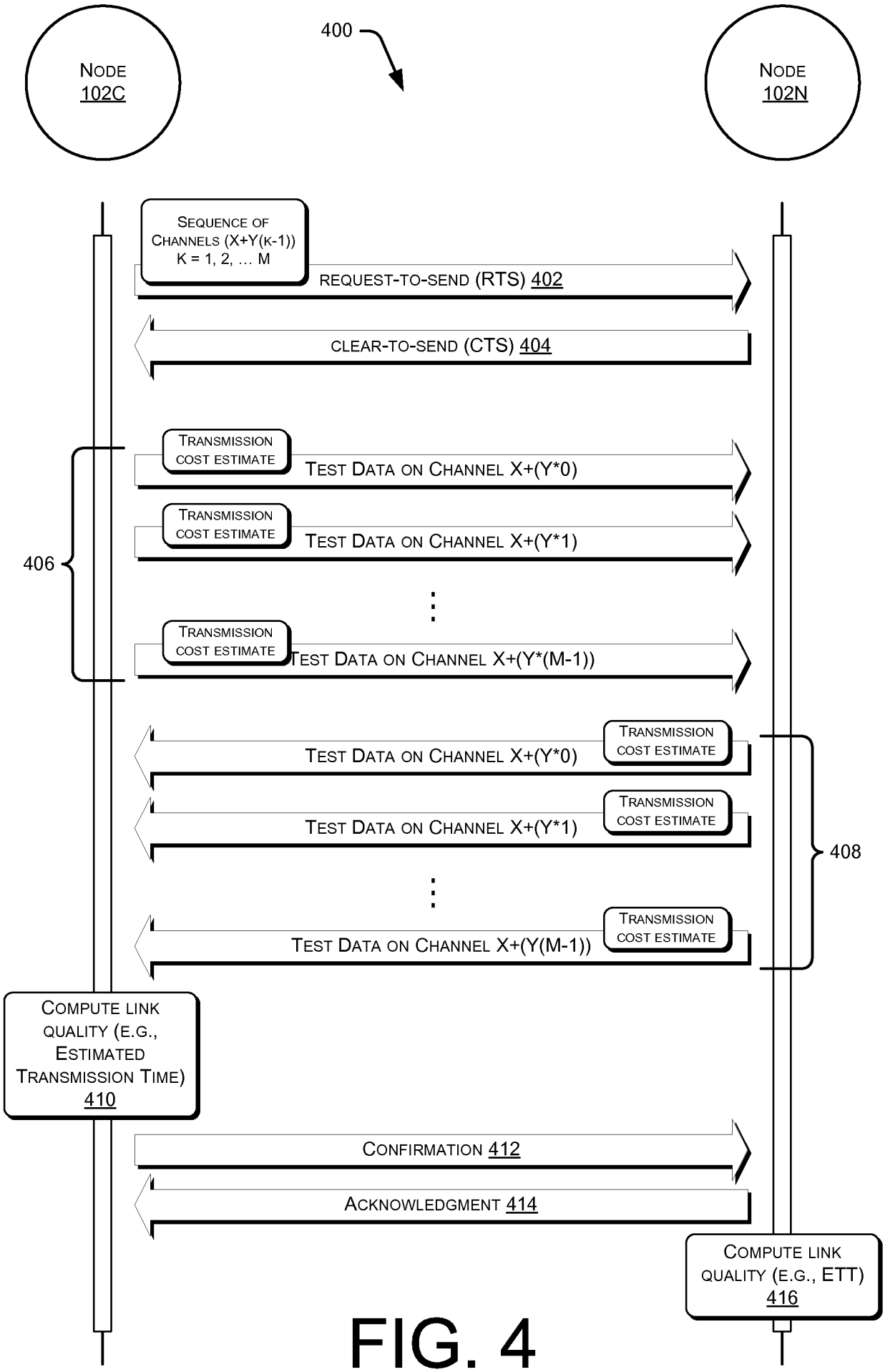

400
NODE 102C
NODE 102N
SEQUENCE OF CHANNELS (X+Y(K-1)) K = 1, 2, … M
REQUEST-TO-SEND (RTS) 402
CLEAR-TO-SEND (CTS) 404
TRANSMISSION COST ESTIMATE
TEST DATA ON CHANNEL X+(Y*0)
TRANSMISSION COST ESTIMATE
TEST DATA ON CHANNEL X+(Y*1)
406
TRANSMISSION COST ESTIMATE
TEST DATA ON CHANNEL X+(Y*(M-1))
TRANSMISSION COST ESTIMATE
TEST DATA ON CHANNEL X+(Y*0)
TRANSMISSION COST ESTIMATE
TEST DATA ON CHANNEL X+(Y*1)
408
TRANSMISSION COST ESTIMATE
TEST DATA ON CHANNEL X+(Y(M-1))
COMPUTE LINK QUALITY (E.G., ESTIMATED TRANSMISSION TIME) 410
CONFIRMATION 412
ACKNOWLEDGMENT 414
COMPUTE LINK QUALITY (E.G., ETT) 416

FIG. 4

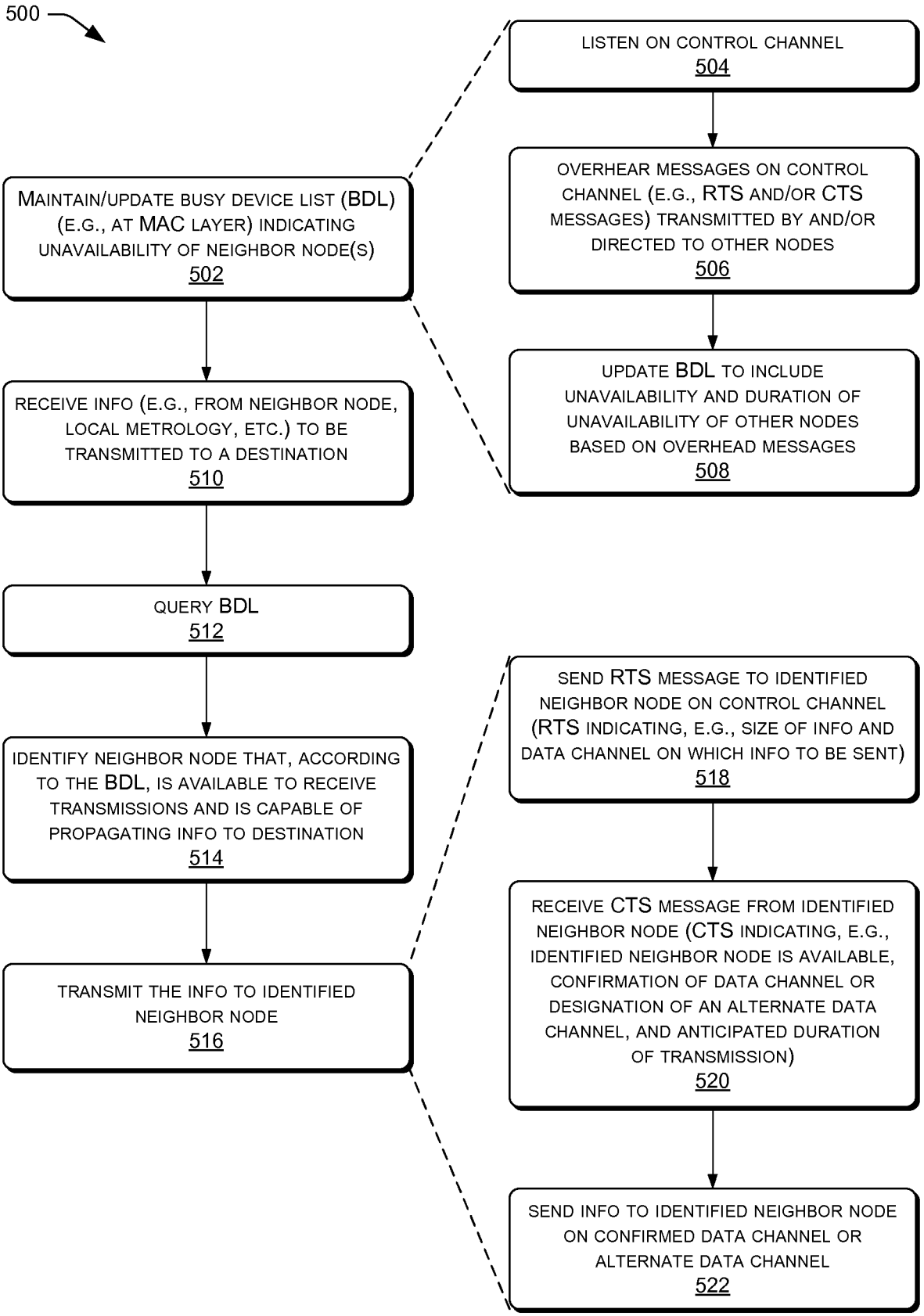

500
MAINTAIN/UPDATE BUSY DEVICE LIST (BDL) (E.G., AT MAC LAYER) INDICATING UNAVAILABILITY OF NEIGHBOR NODE(S)
502
LISTEN ON CONTROL CHANNEL
504
OVERHEAR MESSAGES ON CONTROL CHANNEL (E.G., RTS AND/OR CTS MESSAGES) TRANSMITTED BY AND/OR DIRECTED TO OTHER NODES
506
UPDATE BDL TO INCLUDE UNAVAILABILITY AND DURATION OF UNAVAILABILITY OF OTHER NODES BASED ON OVERHEAD MESSAGES
508
RECEIVE INFO (E.G., FROM NEIGHBOR NODE, LOCAL METROLOGY, ETC.) TO BE TRANSMITTED TO A DESTINATION
510
QUERY BDL
512
IDENTIFY NEIGHBOR NODE THAT, ACCORDING TO THE BDL, IS AVAILABLE TO RECEIVE TRANSMISSIONS AND IS CAPABLE OF PROPAGATING INFO TO DESTINATION
514
TRANSMIT THE INFO TO IDENTIFIED NEIGHBOR NODE
516
SEND RTS MESSAGE TO IDENTIFIED NEIGHBOR NODE ON CONTROL CHANNEL (RTS INDICATING, E.G., SIZE OF INFO AND DATA CHANNEL ON WHICH INFO TO BE SENT)
518
RECEIVE CTS MESSAGE FROM IDENTIFIED NEIGHBOR NODE (CTS INDICATING, E.G., IDENTIFIED NEIGHBOR NODE IS AVAILABLE, CONFIRMATION OF DATA CHANNEL OR DESIGNATION OF AN ALTERNATE DATA CHANNEL, AND ANTICIPATED DURATION OF TRANSMISSION)
520
SEND INFO TO IDENTIFIED NEIGHBOR NODE ON CONFIRMED DATA CHANNEL OR ALTERNATE DATA CHANNEL
522

FIG. 5

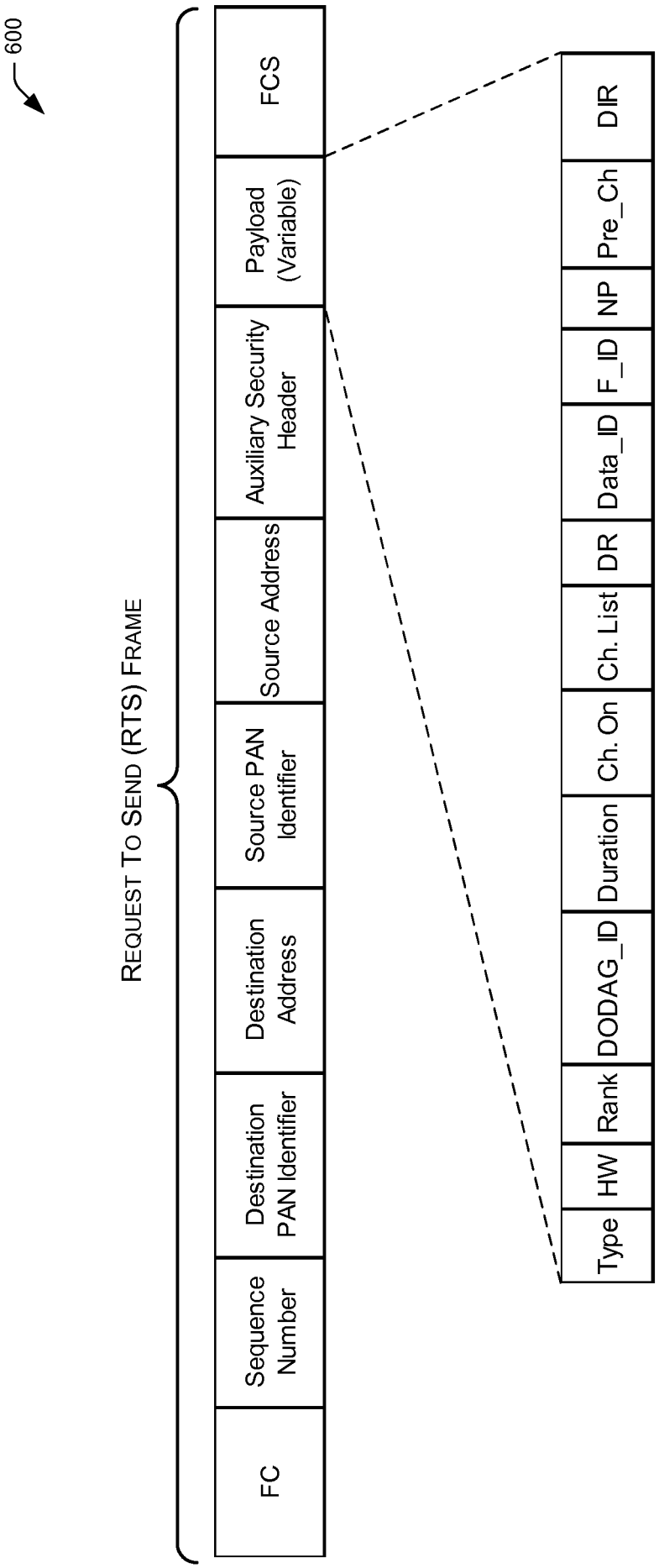

600
REQUEST TO SEND (RTS) FRAME
FC
Sequence Number
Destination PAN Identifier
Destination Address
Source PAN Identifier
Source Address
Auxiliary Security Header
Payload (Variable)
FCS
Type
HW
Rank
DODAG_ID
Duration
Ch. On
Ch. List
DR
Data_ID
F_ID
NP
Pre_Ch
DIR

FIG. 6

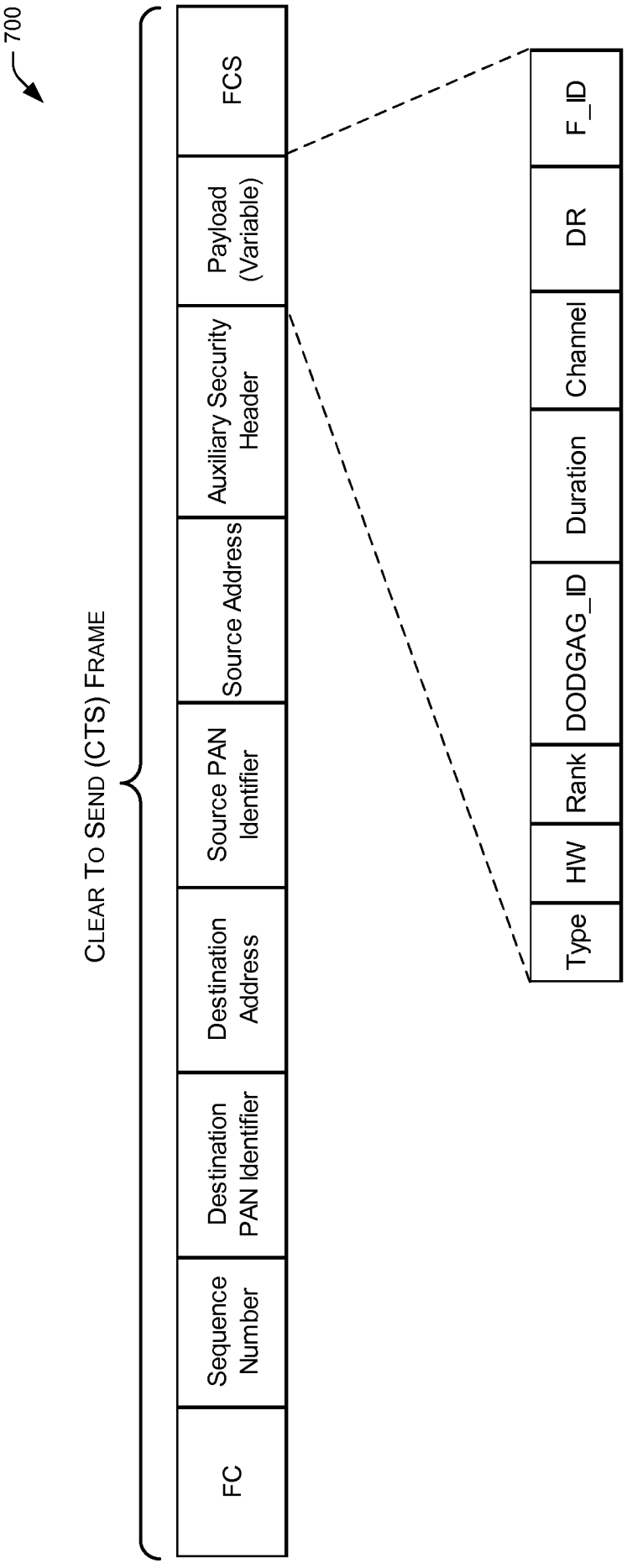

700
CLEAR TO SEND (CTS) FRAME
FC
Sequence Number
Destination PAN Identifier
Destination Address
Source PAN Identifier
Source Address
Auxiliary Security Header
Payload (Variable)
FCS
Type
HW
Rank
DODGAG_ID
Duration
Channel
DR
F_ID

FIG. 7