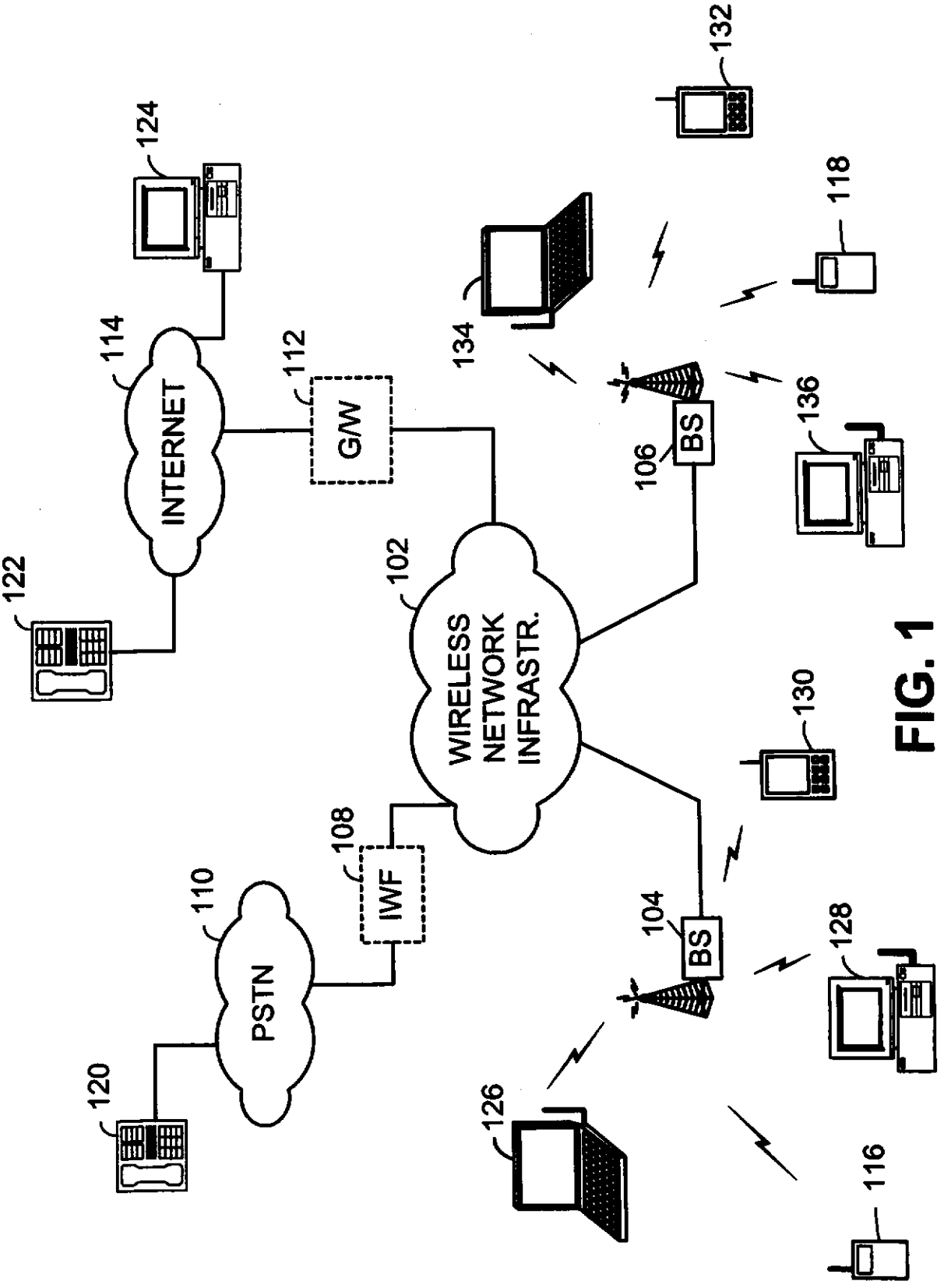

WIRELESS NETWORK INFRASTR.
102
INTERNET
114
G/W
112
PSTN
110
IWF
108
BS
104
BS
106
120
122
124
126
128
130
132
134
136
116
118

FIG. 1

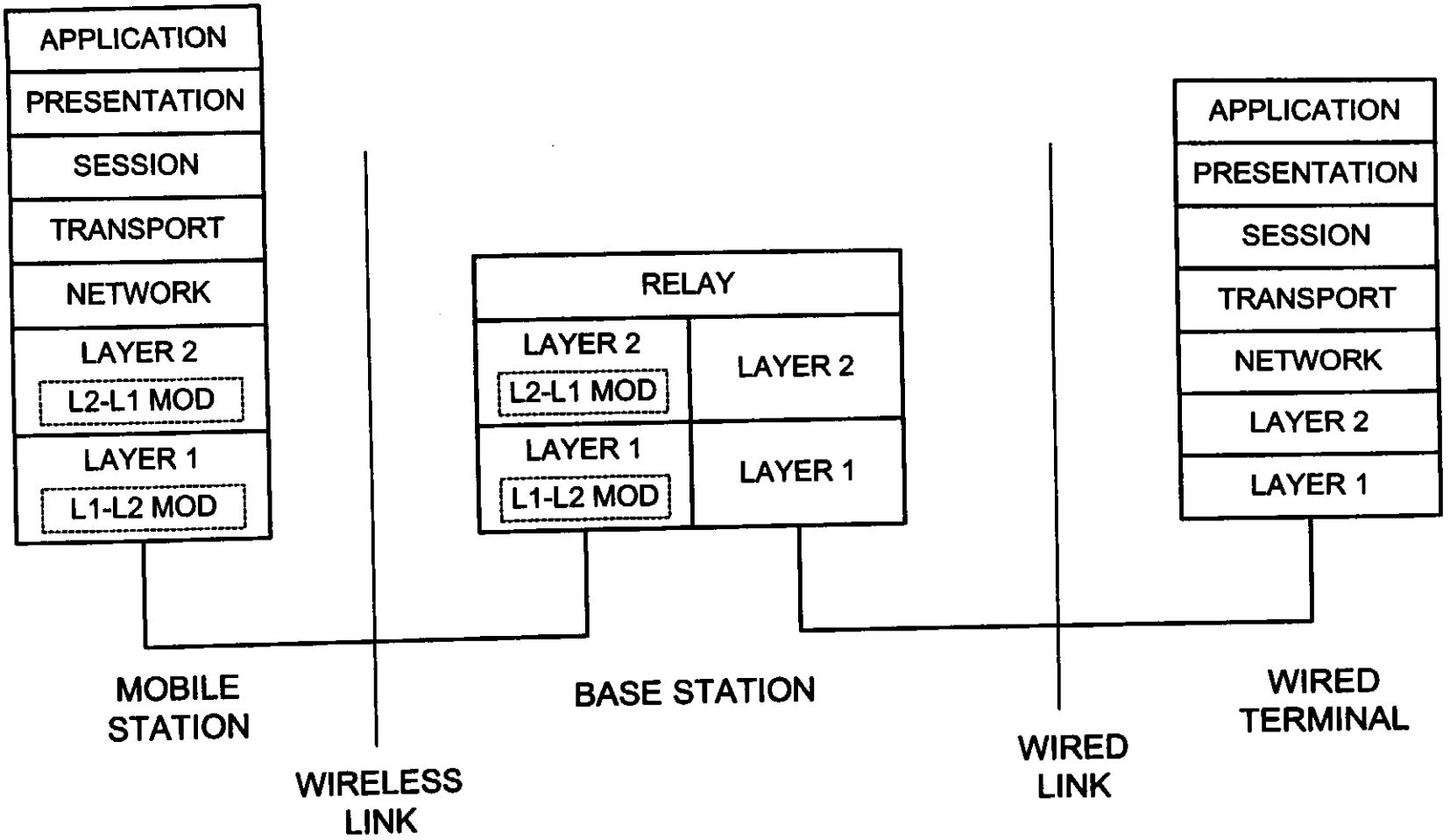


FIG. 2

30 SEP 2004

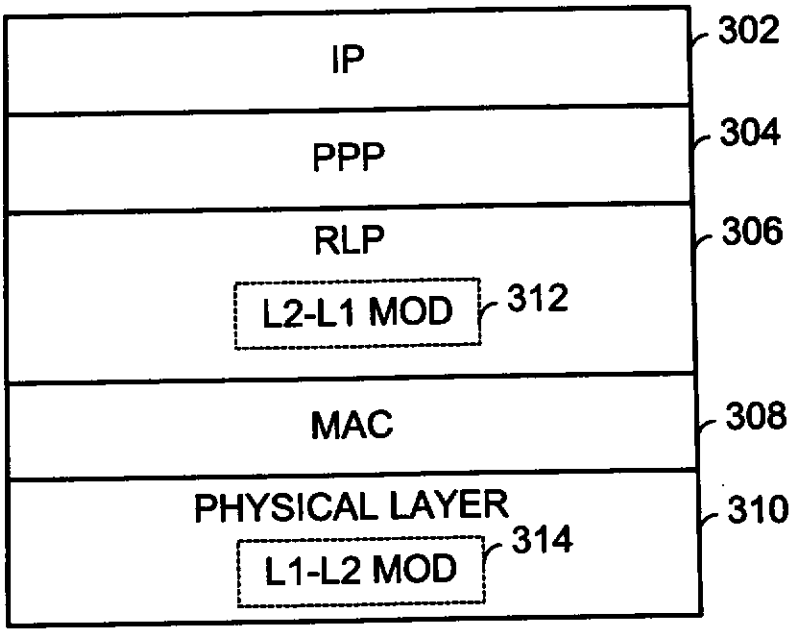

IP
302
PPP
304
RLP
306
L2-L1 MOD
312
MAC
308
PHYSICAL LAYER
310
L1-L2 MOD
314

FIG. 3A

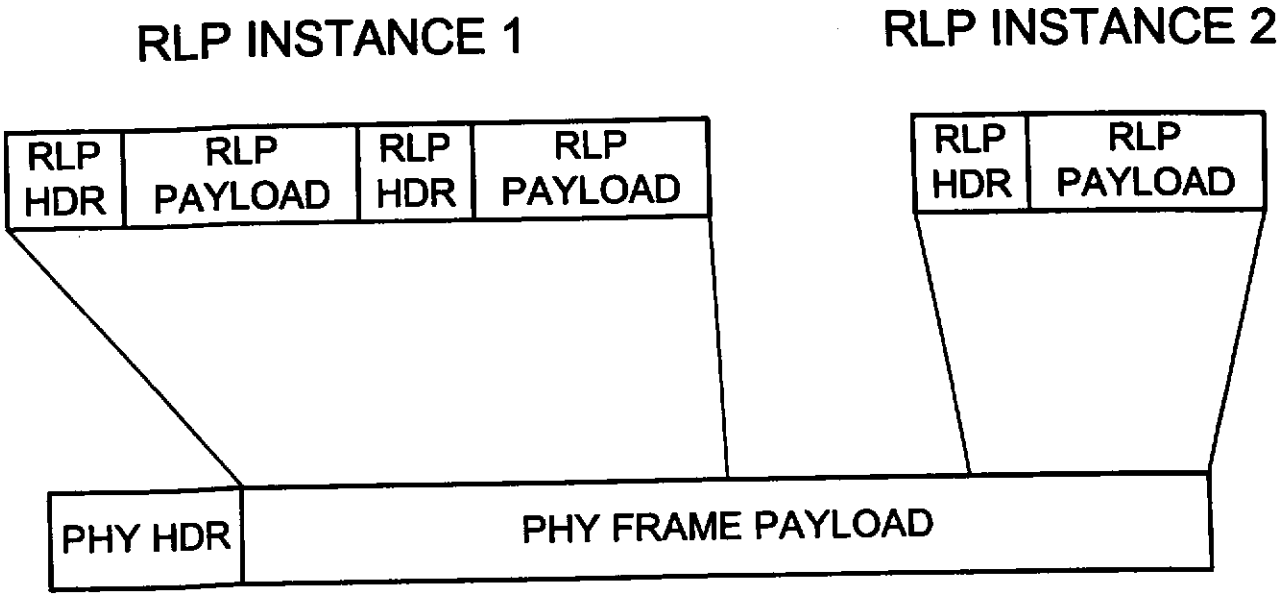

RLP INSTANCE 1
RLP INSTANCE 2
RLP HDR
RLP PAYLOAD
RLP HDR
RLP PAYLOAD
RLP HDR
RLP PAYLOAD
PHY HDR
PHY FRAME PAYLOAD

FIG. 3B

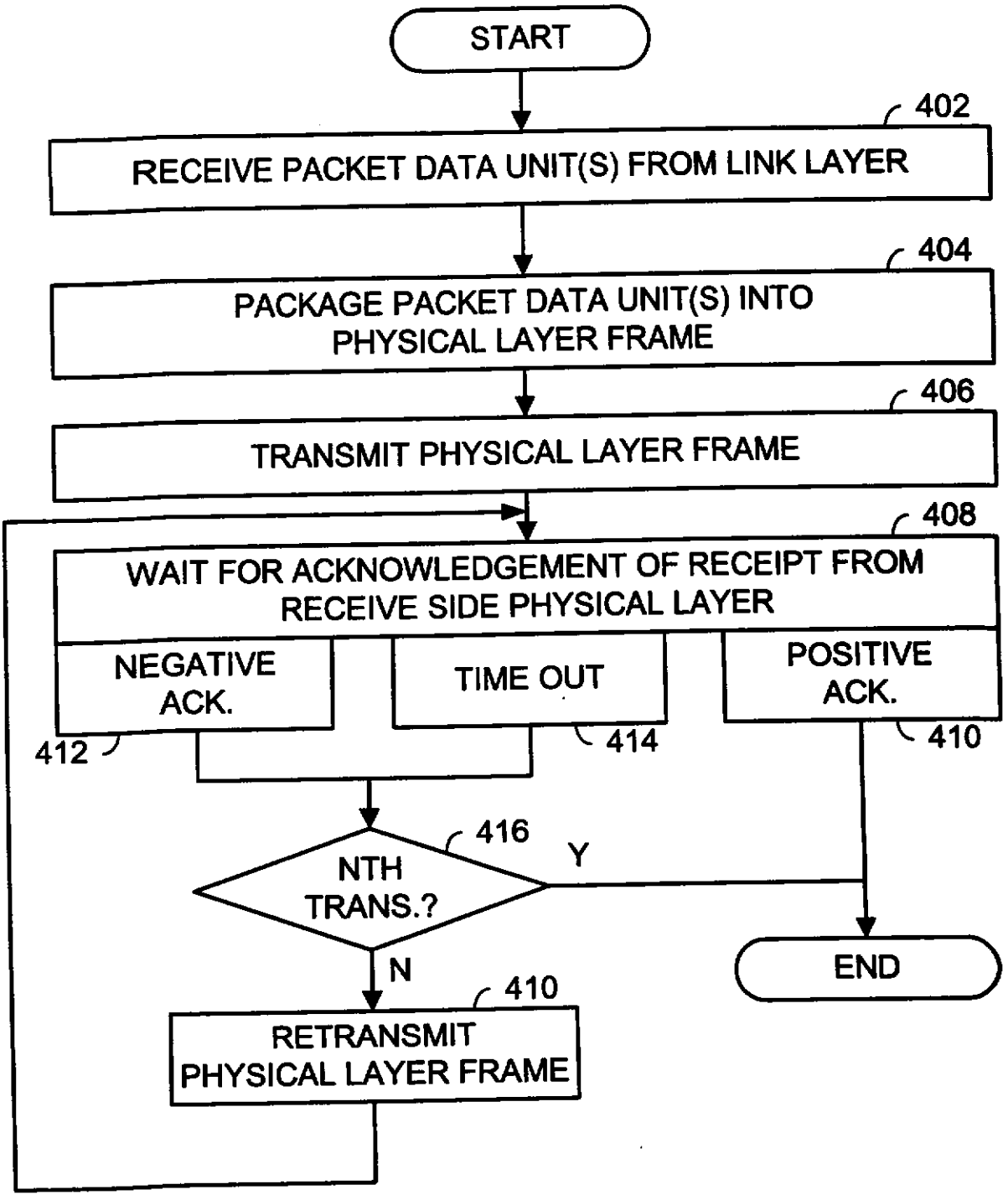

START
402
RECEIVE PACKET DATA UNIT(S) FROM LINK LAYER
404
PACKAGE PACKET DATA UNIT(S) INTO PHYSICAL LAYER FRAME
406
TRANSMIT PHYSICAL LAYER FRAME
408
WAIT FOR ACKNOWLEDGEMENT OF RECEIPT FROM RECEIVE SIDE PHYSICAL LAYER
NEGATIVE ACK.
TIME OUT
POSITIVE ACK.
412
414
410
416
NTH TRANS.?
Y
N
END
410
RETRANSMIT PHYSICAL LAYER FRAME

FIG. 4

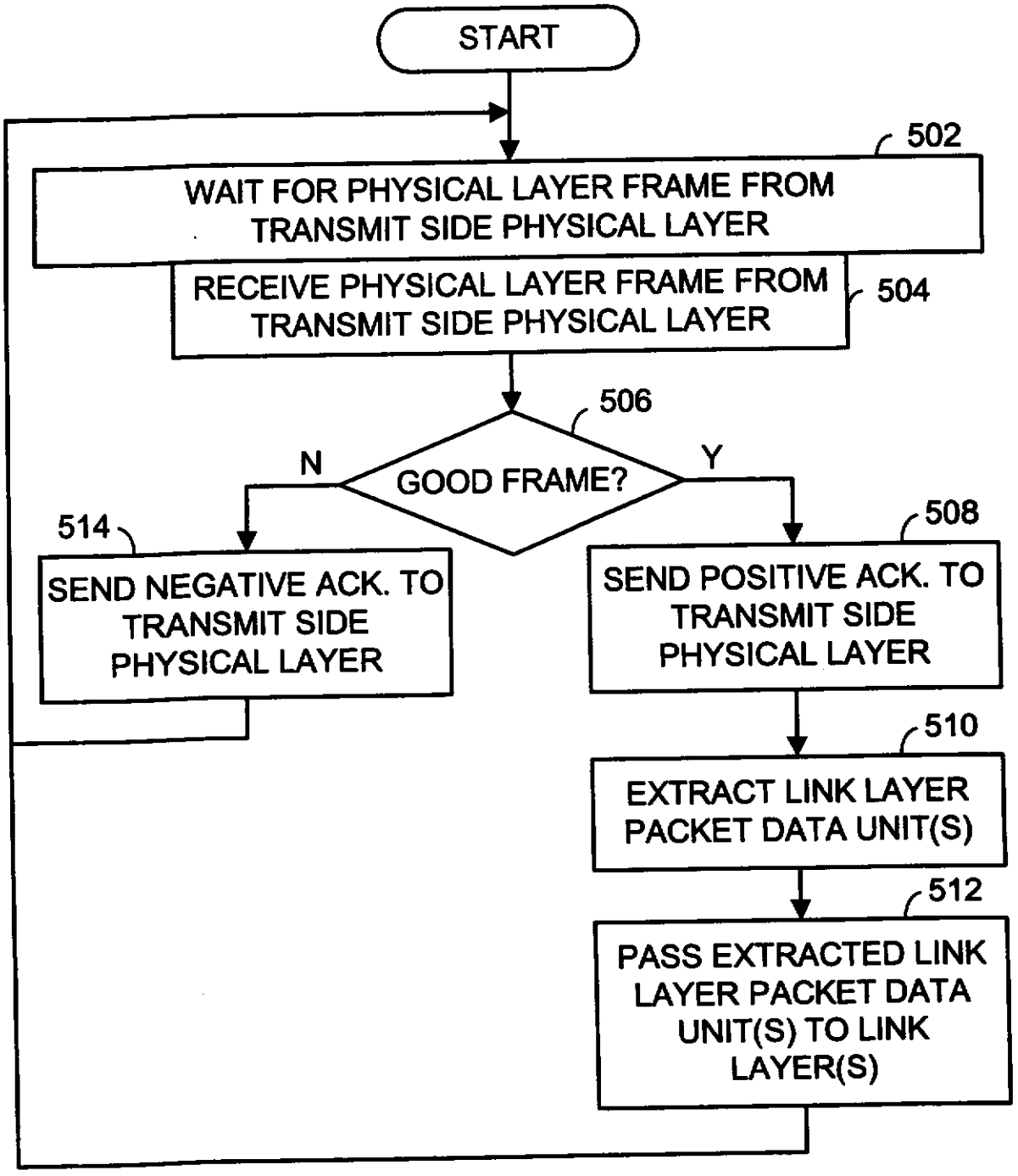

START
502
WAIT FOR PHYSICAL LAYER FRAME FROM TRANSMIT SIDE PHYSICAL LAYER
RECEIVE PHYSICAL LAYER FRAME FROM TRANSMIT SIDE PHYSICAL LAYER
504
506
GOOD FRAME?
N
Y
514
SEND NEGATIVE ACK. TO TRANSMIT SIDE PHYSICAL LAYER
508
SEND POSITIVE ACK. TO TRANSMIT SIDE PHYSICAL LAYER
510
EXTRACT LINK LAYER PACKET DATA UNIT(S)
512
PASS EXTRACTED LINK LAYER PACKET DATA UNIT(S) TO LINK LAYER(S)

FIG. 5

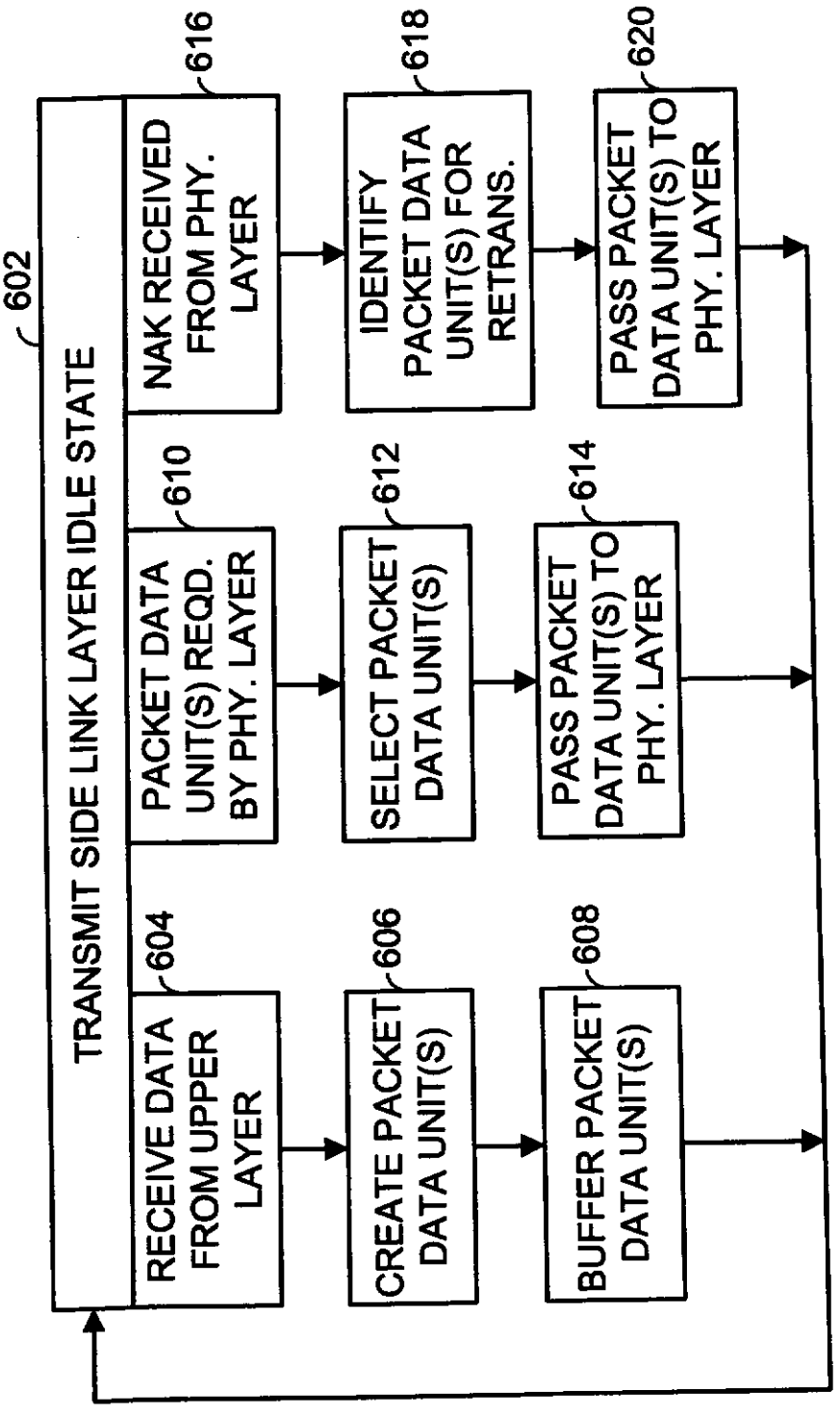

602
TRANSMIT SIDE LINK LAYER IDLE STATE
RECEIVE DATA FROM UPPER LAYER
604
CREATE PACKET DATA UNIT(S)
606
BUFFER PACKET DATA UNIT(S)
608
PACKET DATA UNIT(S) REQD. BY PHY. LAYER
610
SELECT PACKET DATA UNIT(S)
612
PASS PACKET DATA UNIT(S) TO PHY. LAYER
614
NAK RECEIVED FROM PHY. LAYER
616
IDENTIFY PACKET DATA UNIT(S) FOR RETRANS.
618
PASS PACKET DATA UNIT(S) TO PHY. LAYER
620

FIG. 6

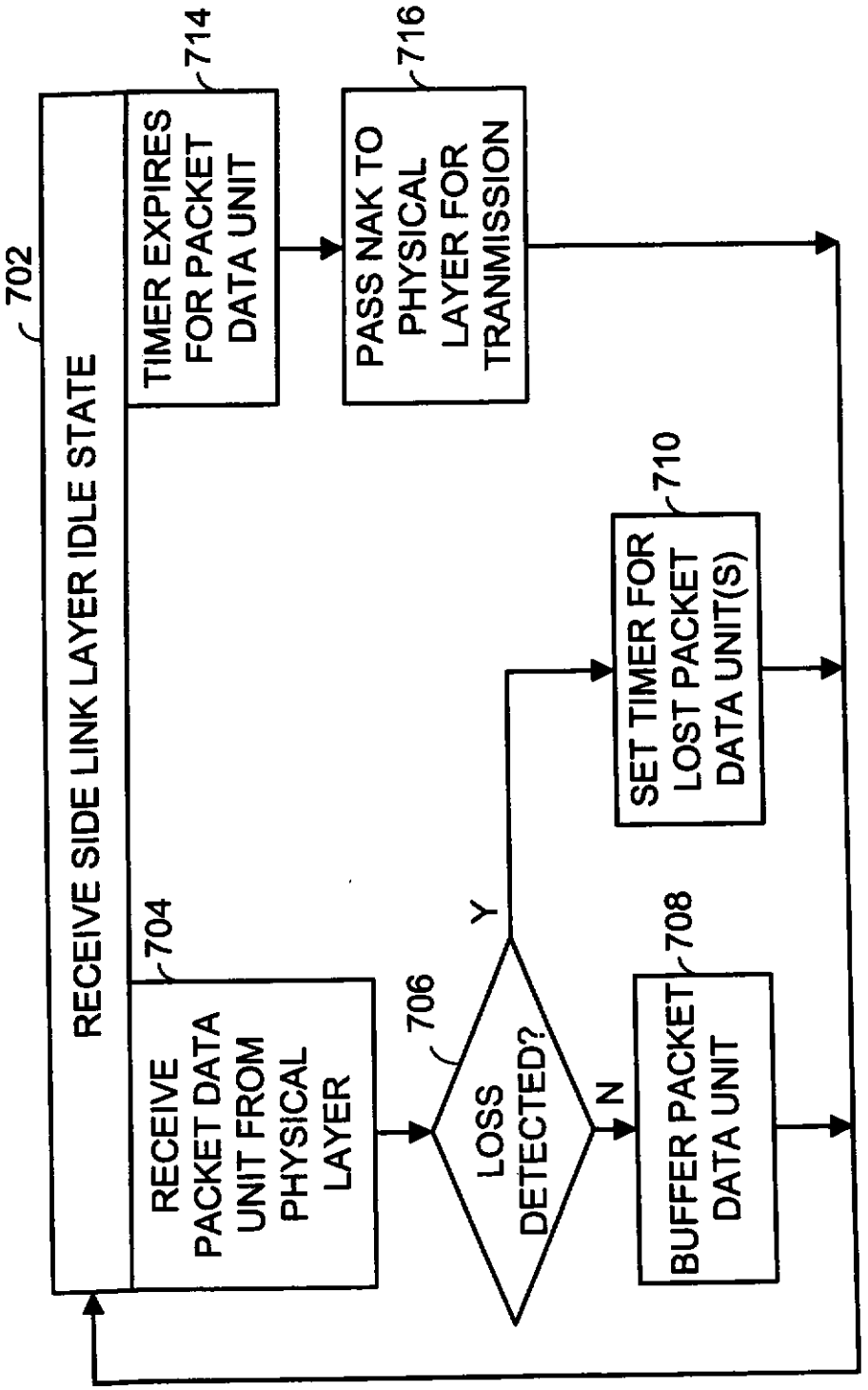
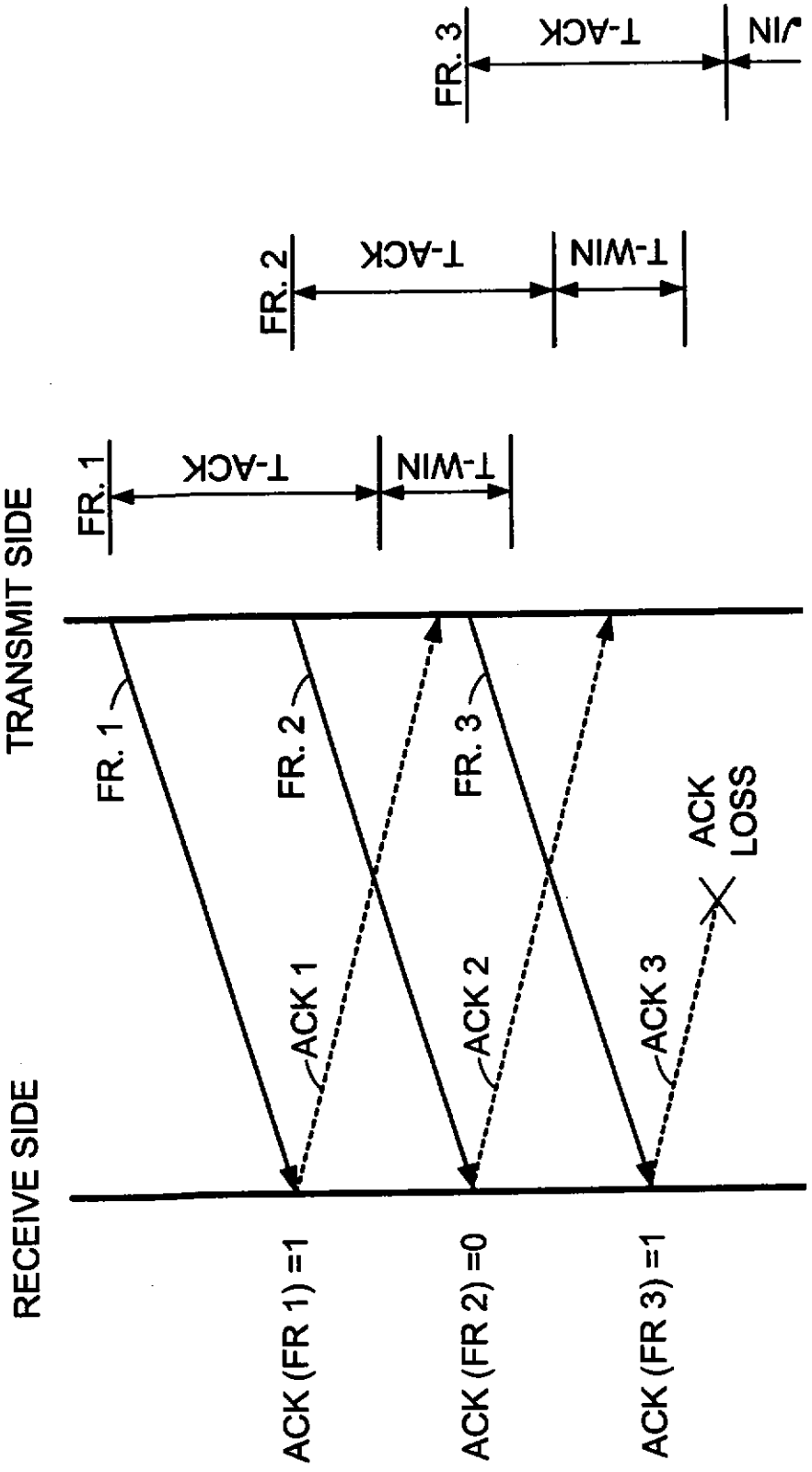

RECEIVE SIDE LINK LAYER IDLE STATE
702
RECEIVE PACKET DATA UNIT FROM PHYSICAL LAYER
704
LOSS DETECTED?
706
Y
N
SET TIMER FOR LOST PACKET DATA UNIT(S)
710
BUFFER PACKET DATA UNIT
708
TIMER EXPIRES FOR PACKET DATA UNIT
714
PASS NAK TO PHYSICAL LAYER FOR TRANMISSION
716

FIG. 7


TRANSMIT SIDE
RECEIVE SIDE
FR. 1
T-ACK
T-WIN
FR. 2
T-ACK
T-WIN
FR. 3
T-ACK
T-WIN
FR. 1
FR. 2
FR. 3
ACK 1
ACK 2
ACK 3
ACK LOSS
ACK (FR 1) =1
ACK (FR 2) =0
ACK (FR 3) =1

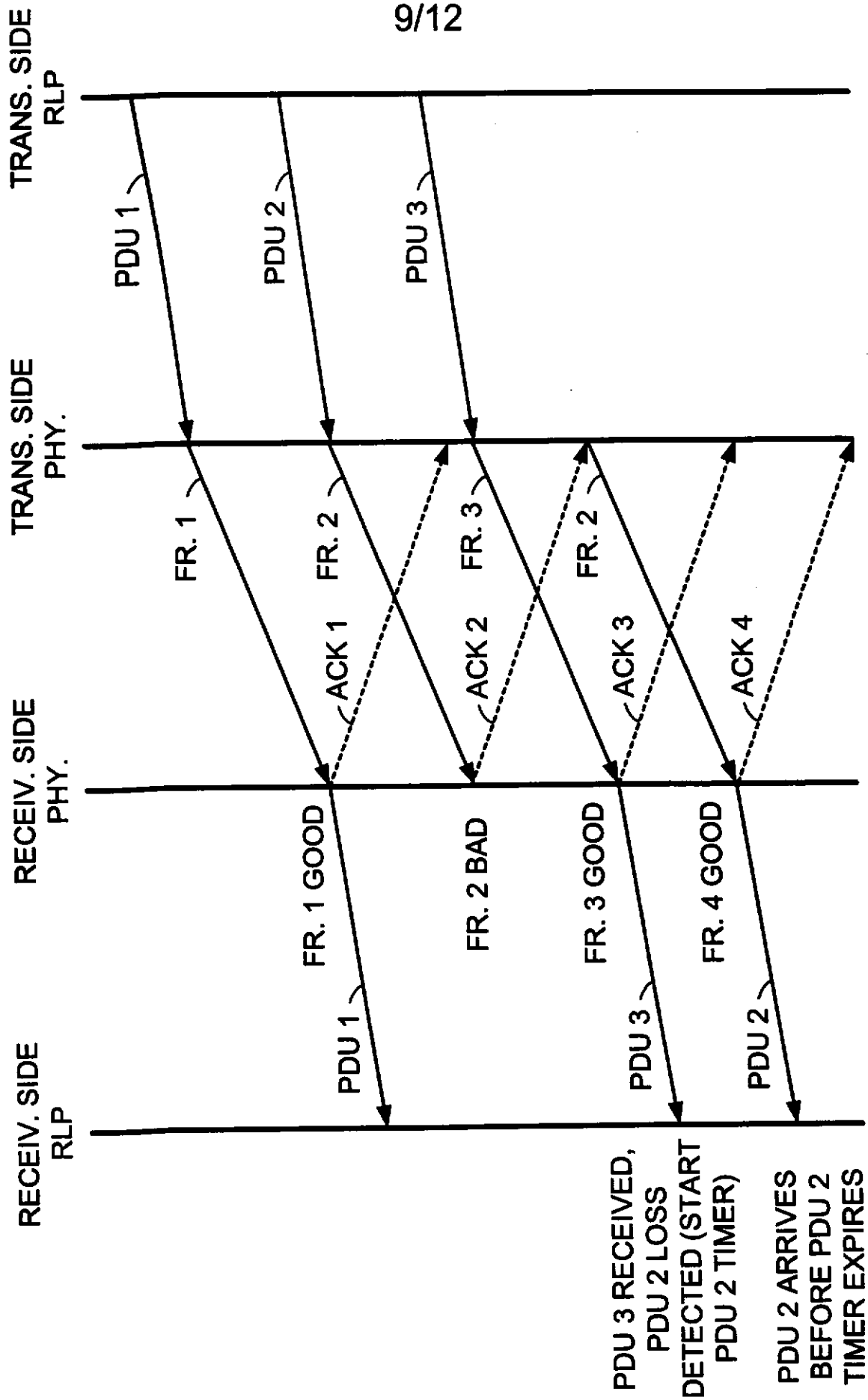

TRANS. SIDE RLP
TRANS. SIDE PHY.
RECEIV. SIDE PHY.
RECEIV. SIDE RLP
PDU 1
PDU 2
PDU 3
FR. 1
FR. 2
FR. 3
FR. 2
ACK 1
ACK 2
ACK 3
ACK 4
FR. 1 GOOD
FR. 2 BAD
FR. 3 GOOD
FR. 4 GOOD
PDU 1
PDU 3
PDU 2
PDU 3 RECEIVED, PDU 2 LOSS DETECTED (START PDU 2 TIMER)
PDU 2 ARRIVES BEFORE PDU 2 TIMER EXPIRES (NO NACK SENT)

FIG. 9

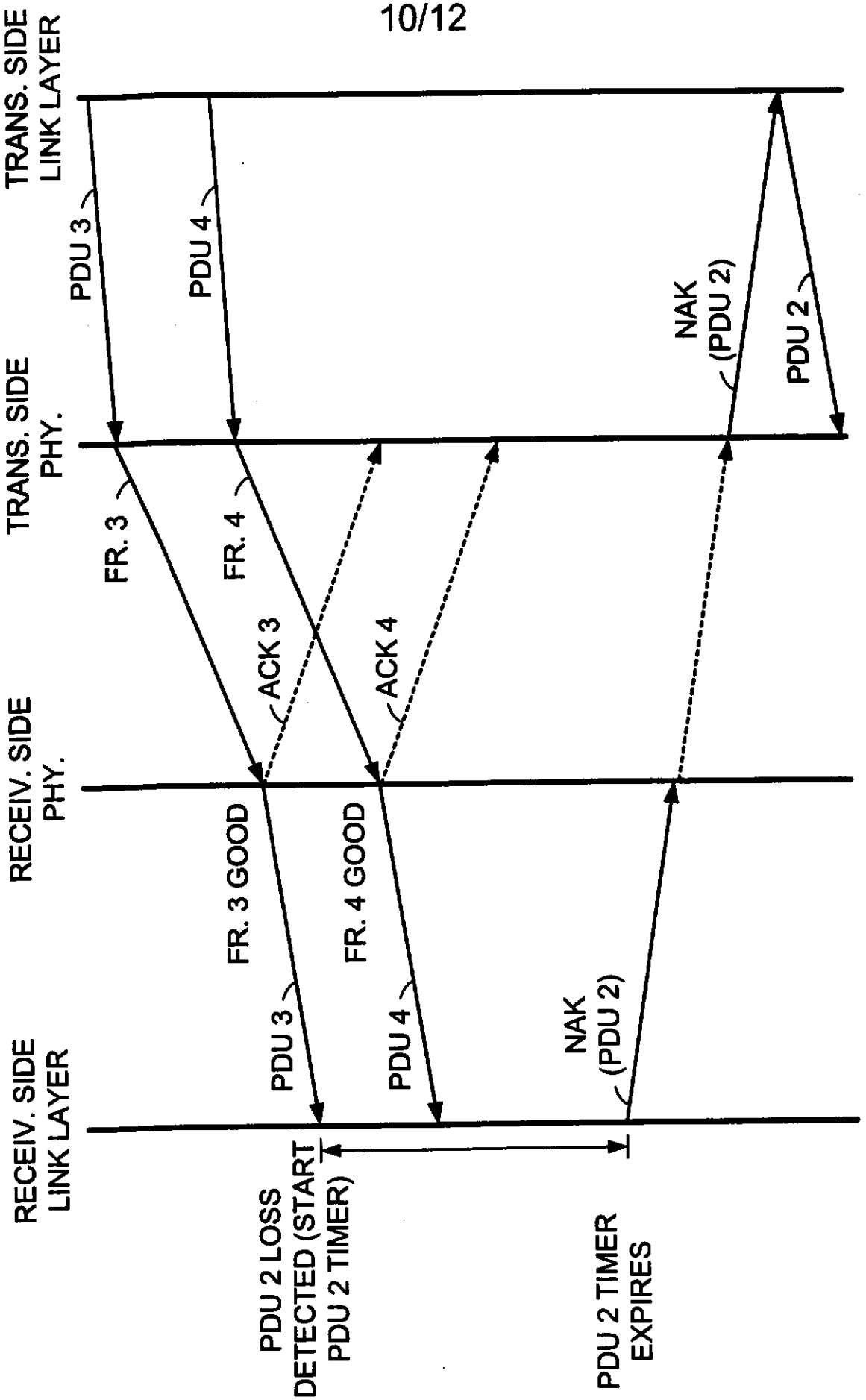

TRANS. SIDE LINK LAYER
TRANS. SIDE PHY.
RECEIV. SIDE PHY.
RECEIV. SIDE LINK LAYER
PDU 3
PDU 4
NAK (PDU 2)
PDU 2
FR. 3
FR. 4
ACK 3
ACK 4
FR. 3 GOOD
FR. 4 GOOD
PDU 3
PDU 4
NAK (PDU 2)
PDU 2 LOSS DETECTED (START PDU 2 TIMER)
PDU 2 TIMER EXPIRES

FIG. 10

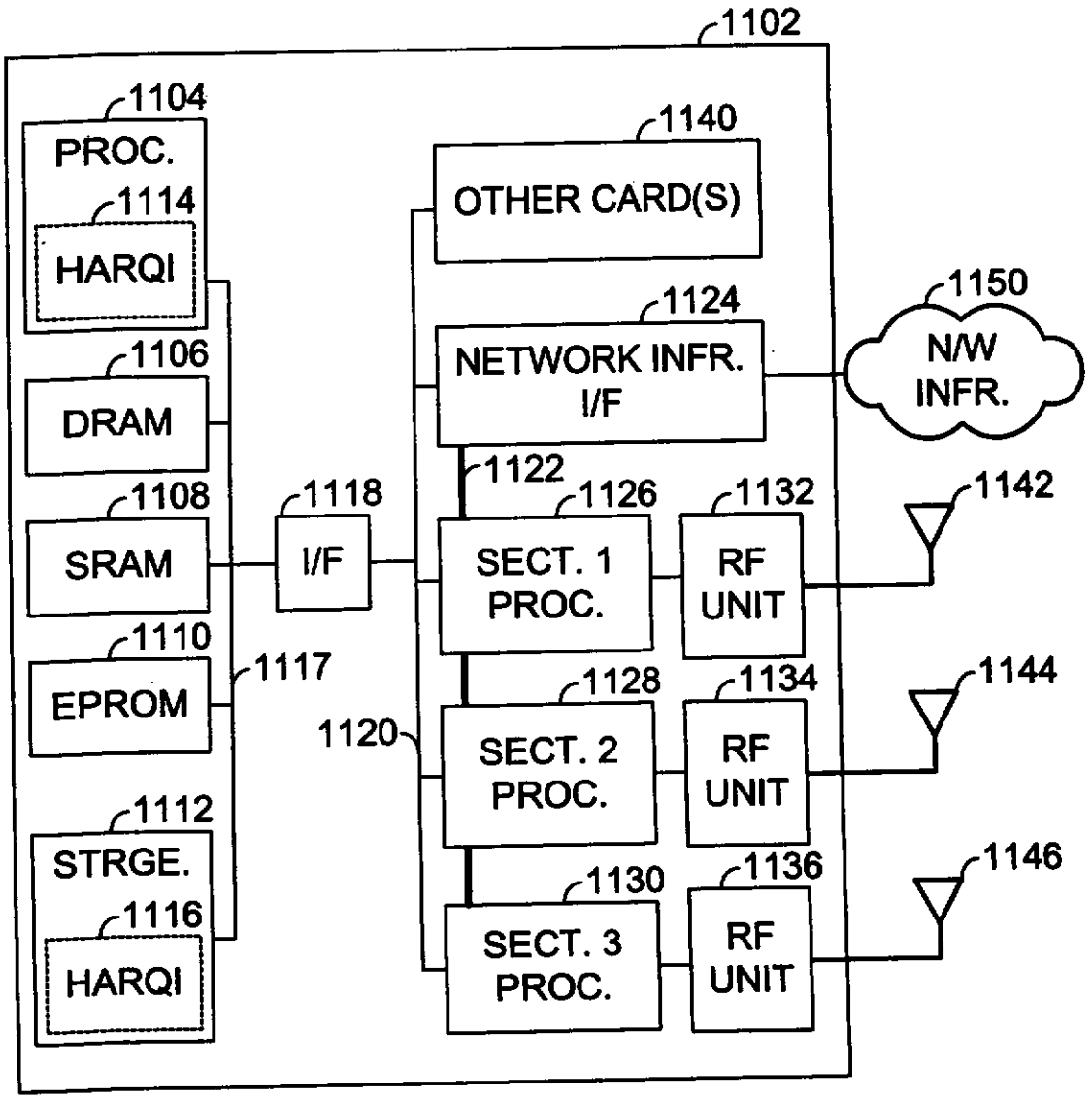

1102
1104
PROC.
1114
HARQI
1106
DRAM
1108
SRAM
1110
EPROM
1112
STRGE.
1116
HARQI
1117
1118
I/F
1120
1122
1124
NETWORK INFR. I/F
1126
SECT. 1 PROC.
1128
SECT. 2 PROC.
1130
SECT. 3 PROC.
1132
RF UNIT
1134
RF UNIT
1136
RF UNIT
1140
OTHER CARD(S)
1142
1144
1146
1150
N/W INFR.

FIG. 11

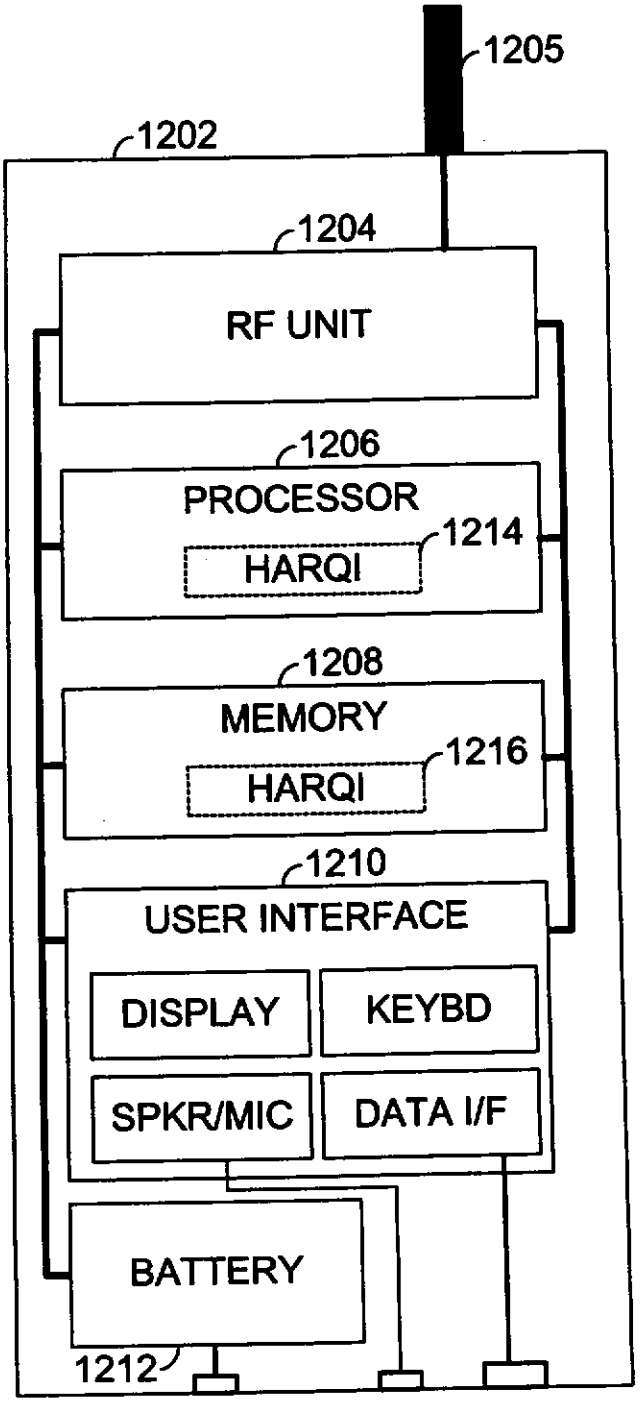

1205
1202
1204
RF UNIT
1206
PROCESSOR
1214
HARQI
1208
MEMORY
1216
HARQI
1210
USER INTERFACE
DISPLAY
KEYBD
SPKR/MIC
DATA I/F
BATTERY
1212

FIG. 12