

FIG. 1
PRIOR ART

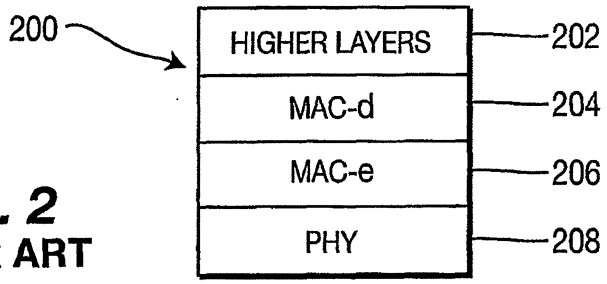


FIG. 2
PRIOR ART

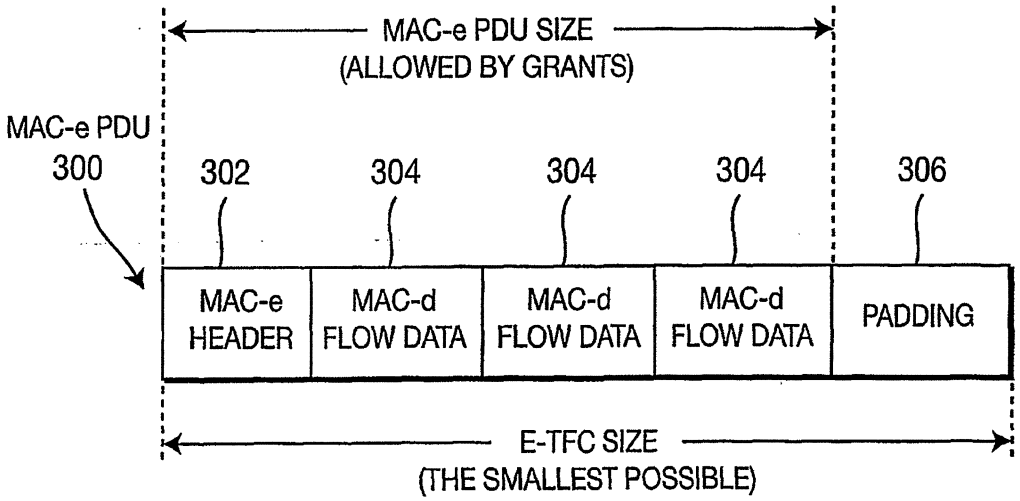


FIG. 3
PRIOR ART

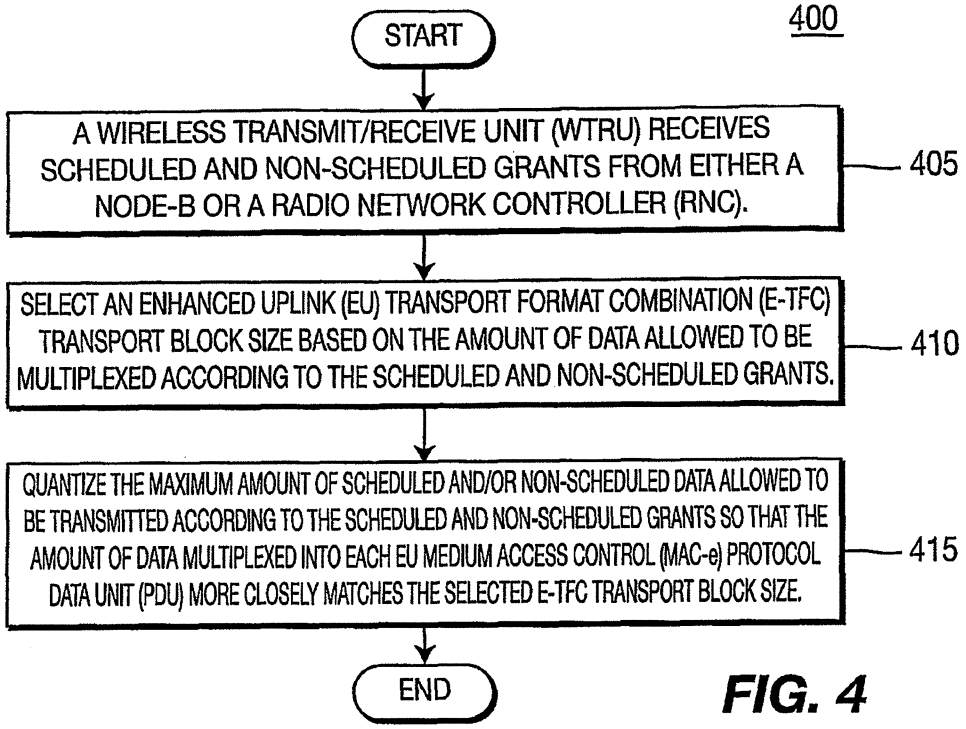

START
400
A WIRELESS TRANSMIT/RECEIVE UNIT (WTRU) RECEIVES SCHEDULED AND NON-SCHEDULED GRANTS FROM EITHER A NODE-B OR A RADIO NETWORK CONTROLLER (RNC).
405
SELECT AN ENHANCED UPLINK (EU) TRANSPORT FORMAT COMBINATION (E-TFC) TRANSPORT BLOCK SIZE BASED ON THE AMOUNT OF DATA ALLOWED TO BE MULTIPLEXED ACCORDING TO THE SCHEDULED AND NON-SCHEDULED GRANTS.
410
QUANTIZE THE MAXIMUM AMOUNT OF SCHEDULED AND/OR NON-SCHEDULED DATA ALLOWED TO BE TRANSMITTED ACCORDING TO THE SCHEDULED AND NON-SCHEDULED GRANTS SO THAT THE AMOUNT OF DATA MULTIPLEXED INTO EACH EU MEDIUM ACCESS CONTROL (MAC-e) PROTOCOL DATA UNIT (PDU) MORE CLOSELY MATCHES THE SELECTED E-TFC TRANSPORT BLOCK SIZE.
415
END

FIG. 4

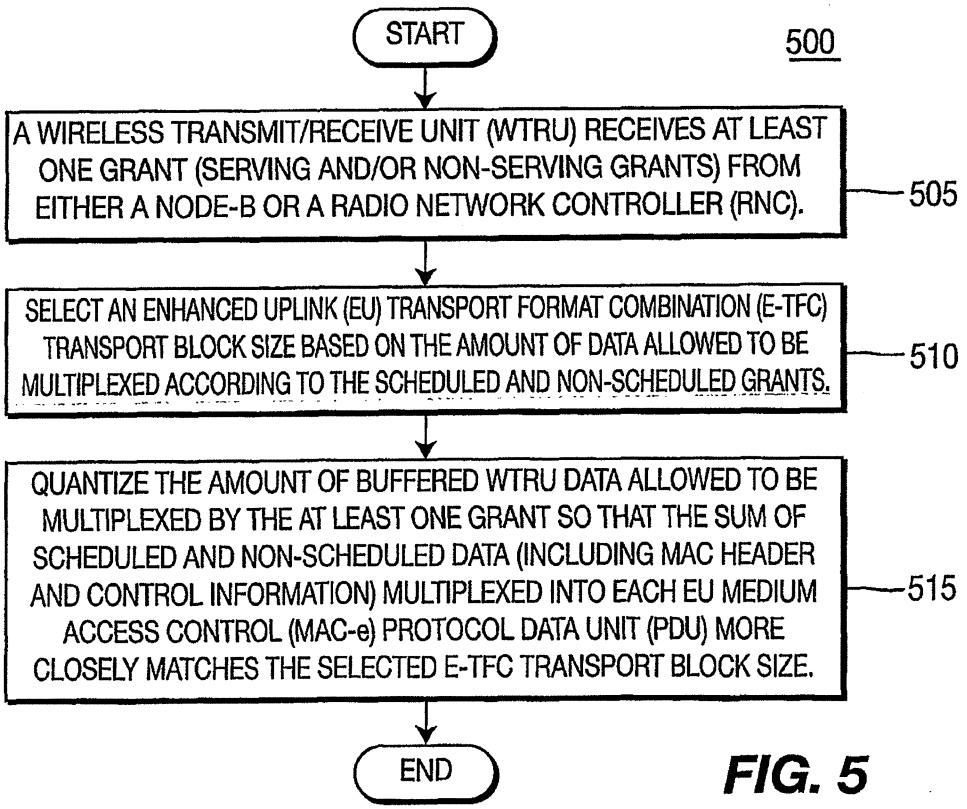

START
500
A WIRELESS TRANSMIT/RECEIVE UNIT (WTRU) RECEIVES AT LEAST ONE GRANT (SERVING AND/OR NON-SERVING GRANTS) FROM EITHER A NODE-B OR A RADIO NETWORK CONTROLLER (RNC).
505
SELECT AN ENHANCED UPLINK (EU) TRANSPORT FORMAT COMBINATION (E-TFC) TRANSPORT BLOCK SIZE BASED ON THE AMOUNT OF DATA ALLOWED TO BE MULTIPLEXED ACCORDING TO THE SCHEDULED AND NON-SCHEDULED GRANTS.
510
QUANTIZE THE AMOUNT OF BUFFERED WTRU DATA ALLOWED TO BE MULTIPLEXED BY THE AT LEAST ONE GRANT SO THAT THE SUM OF SCHEDULED AND NON-SCHEDULED DATA (INCLUDING MAC HEADER AND CONTROL INFORMATION) MULTIPLEXED INTO EACH EU MEDIUM ACCESS CONTROL (MAC-e) PROTOCOL DATA UNIT (PDU) MORE CLOSELY MATCHES THE SELECTED E-TFC TRANSPORT BLOCK SIZE.
515
END

FIG. 5

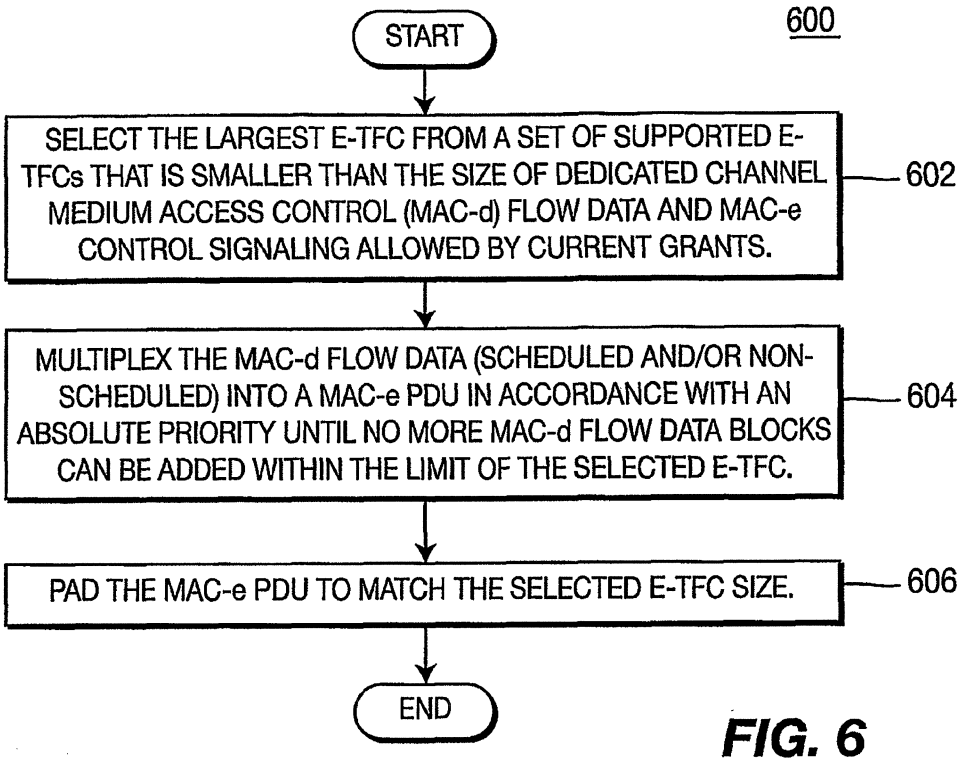

600
START
SELECT THE LARGEST E-TFC FROM A SET OF SUPPORTED E-TFCs THAT IS SMALLER THAN THE SIZE OF DEDICATED CHANNEL MEDIUM ACCESS CONTROL (MAC-d) FLOW DATA AND MAC-e CONTROL SIGNALING ALLOWED BY CURRENT GRANTS.
602
MULTIPLEX THE MAC-d FLOW DATA (SCHEDULED AND/OR NON-SCHEDULED) INTO A MAC-e PDU IN ACCORDANCE WITH AN ABSOLUTE PRIORITY UNTIL NO MORE MAC-d FLOW DATA BLOCKS CAN BE ADDED WITHIN THE LIMIT OF THE SELECTED E-TFC.
604
PAD THE MAC-e PDU TO MATCH THE SELECTED E-TFC SIZE.
606
END

FIG. 6

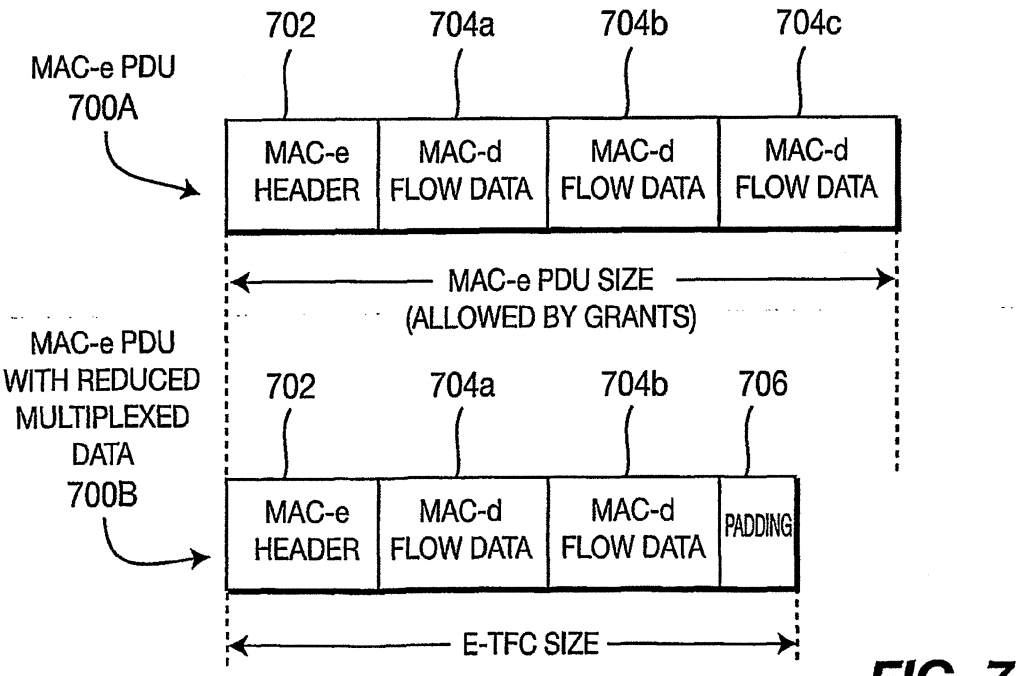

MAC-e PDU
700A
702
704a
704b
704c
MAC-e HEADER
MAC-d FLOW DATA
MAC-d FLOW DATA
MAC-d FLOW DATA
MAC-e PDU SIZE
(ALLOWED BY GRANTS)
MAC-e PDU WITH REDUCED MULTIPLEXED DATA
700B
702
704a
704b
706
MAC-e HEADER
MAC-d FLOW DATA
MAC-d FLOW DATA
PADDING
E-TFC SIZE

FIG. 7

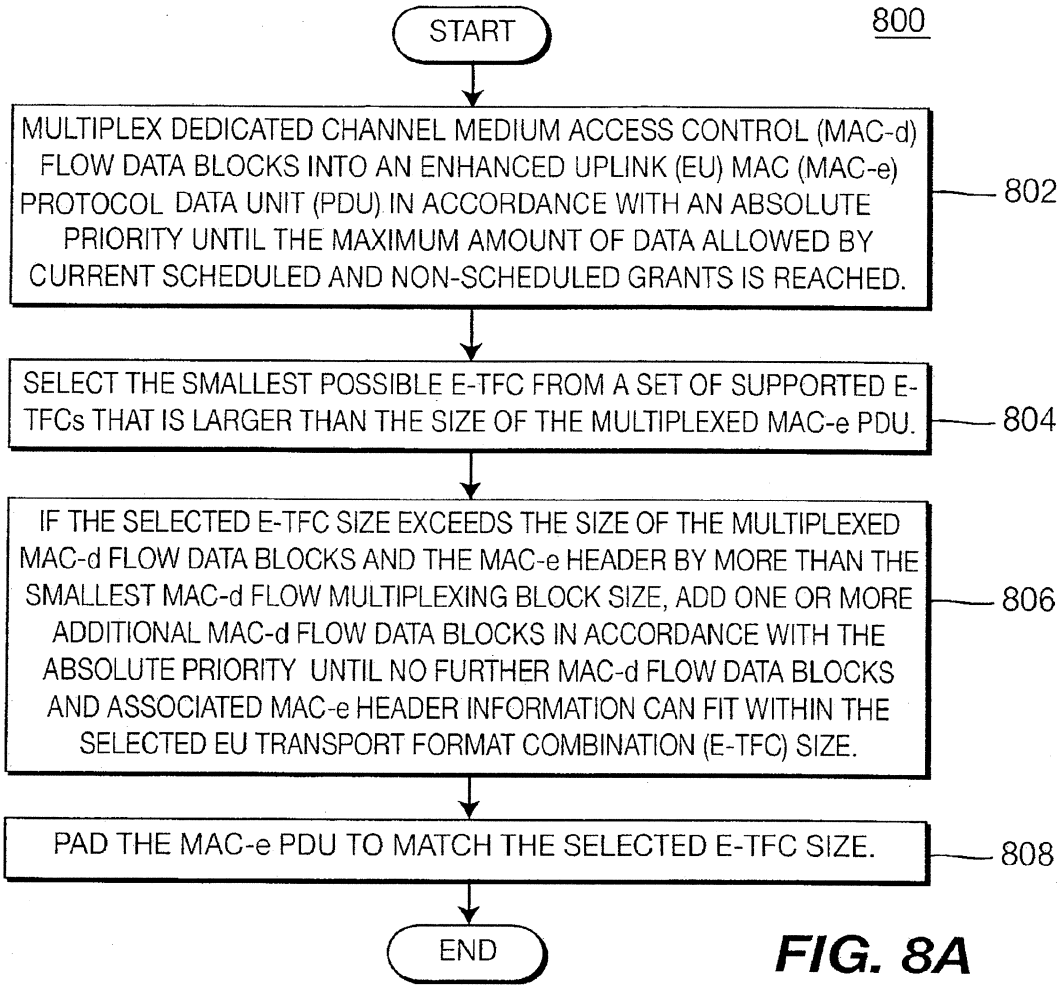

START
800
MULTIPLEX DEDICATED CHANNEL MEDIUM ACCESS CONTROL (MAC-d) FLOW DATA BLOCKS INTO AN ENHANCED UPLINK (EU) MAC (MAC-e) PROTOCOL DATA UNIT (PDU) IN ACCORDANCE WITH AN ABSOLUTE PRIORITY UNTIL THE MAXIMUM AMOUNT OF DATA ALLOWED BY CURRENT SCHEDULED AND NON-SCHEDULED GRANTS IS REACHED.
802
SELECT THE SMALLEST POSSIBLE E-TFC FROM A SET OF SUPPORTED E-TFCs THAT IS LARGER THAN THE SIZE OF THE MULTIPLEXED MAC-e PDU.
804
IF THE SELECTED E-TFC SIZE EXCEEDS THE SIZE OF THE MULTIPLEXED MAC-d FLOW DATA BLOCKS AND THE MAC-e HEADER BY MORE THAN THE SMALLEST MAC-d FLOW MULTIPLEXING BLOCK SIZE, ADD ONE OR MORE ADDITIONAL MAC-d FLOW DATA BLOCKS IN ACCORDANCE WITH THE ABSOLUTE PRIORITY UNTIL NO FURTHER MAC-d FLOW DATA BLOCKS AND ASSOCIATED MAC-e HEADER INFORMATION CAN FIT WITHIN THE SELECTED EU TRANSPORT FORMAT COMBINATION (E-TFC) SIZE.
806
PAD THE MAC-e PDU TO MATCH THE SELECTED E-TFC SIZE.
808
END

FIG. 8A

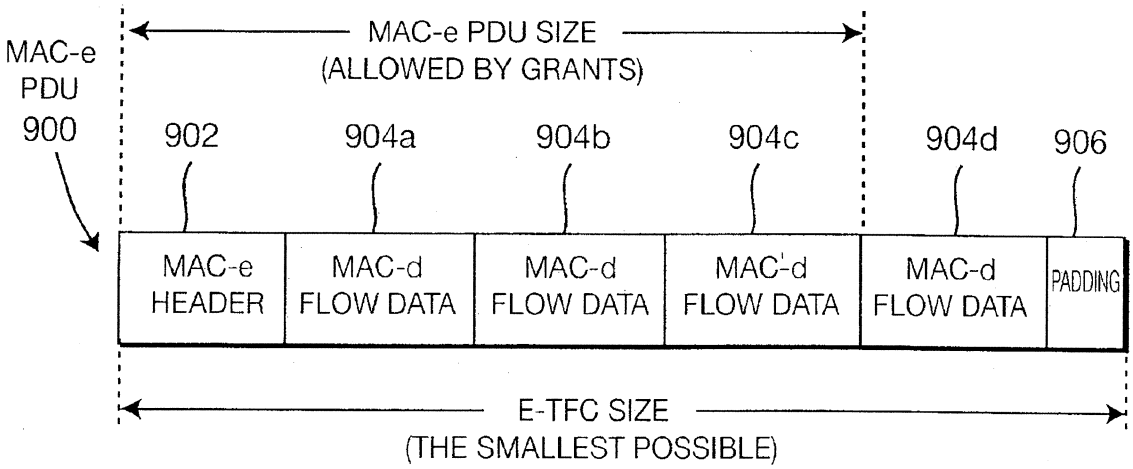

MAC-e PDU 900
MAC-e PDU SIZE (ALLOWED BY GRANTS)
902
904a
904b
904c
904d
906
MAC-e HEADER
MAC-d FLOW DATA
MAC-d FLOW DATA
MAC-d FLOW DATA
MAC-d FLOW DATA
PADDING
E-TFC SIZE (THE SMALLEST POSSIBLE)

FIG. 9

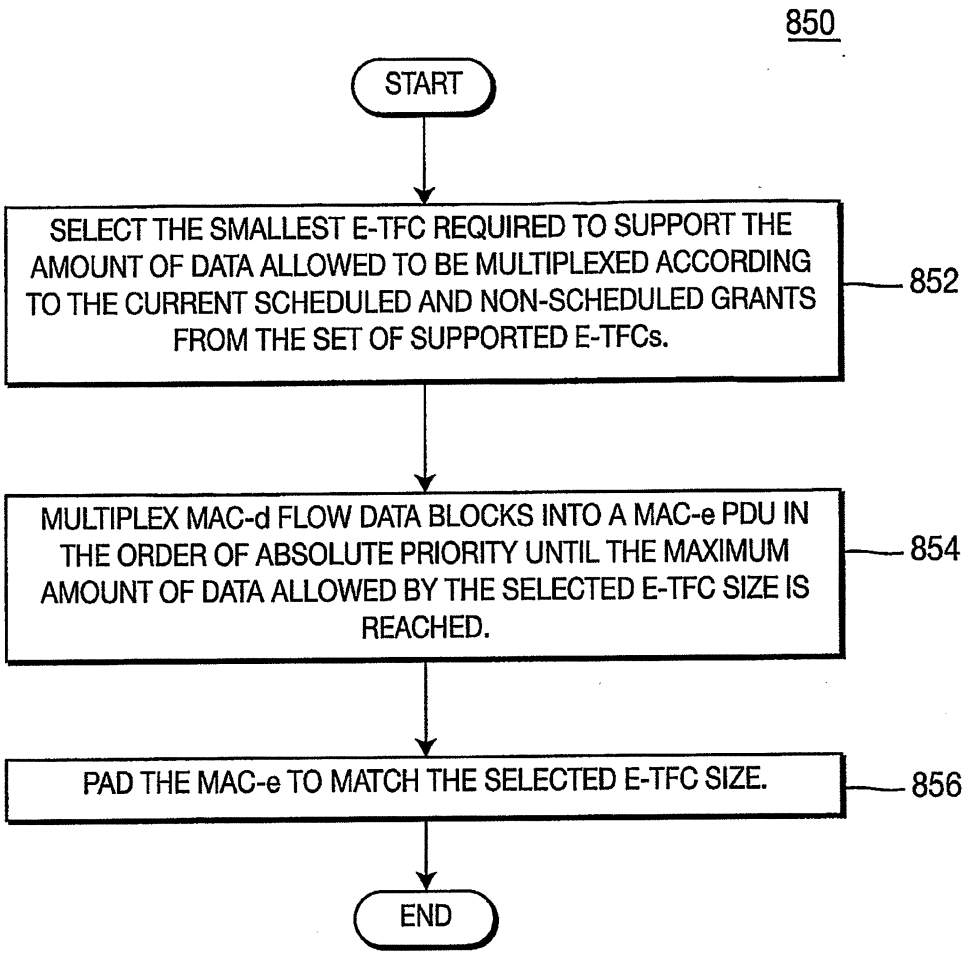
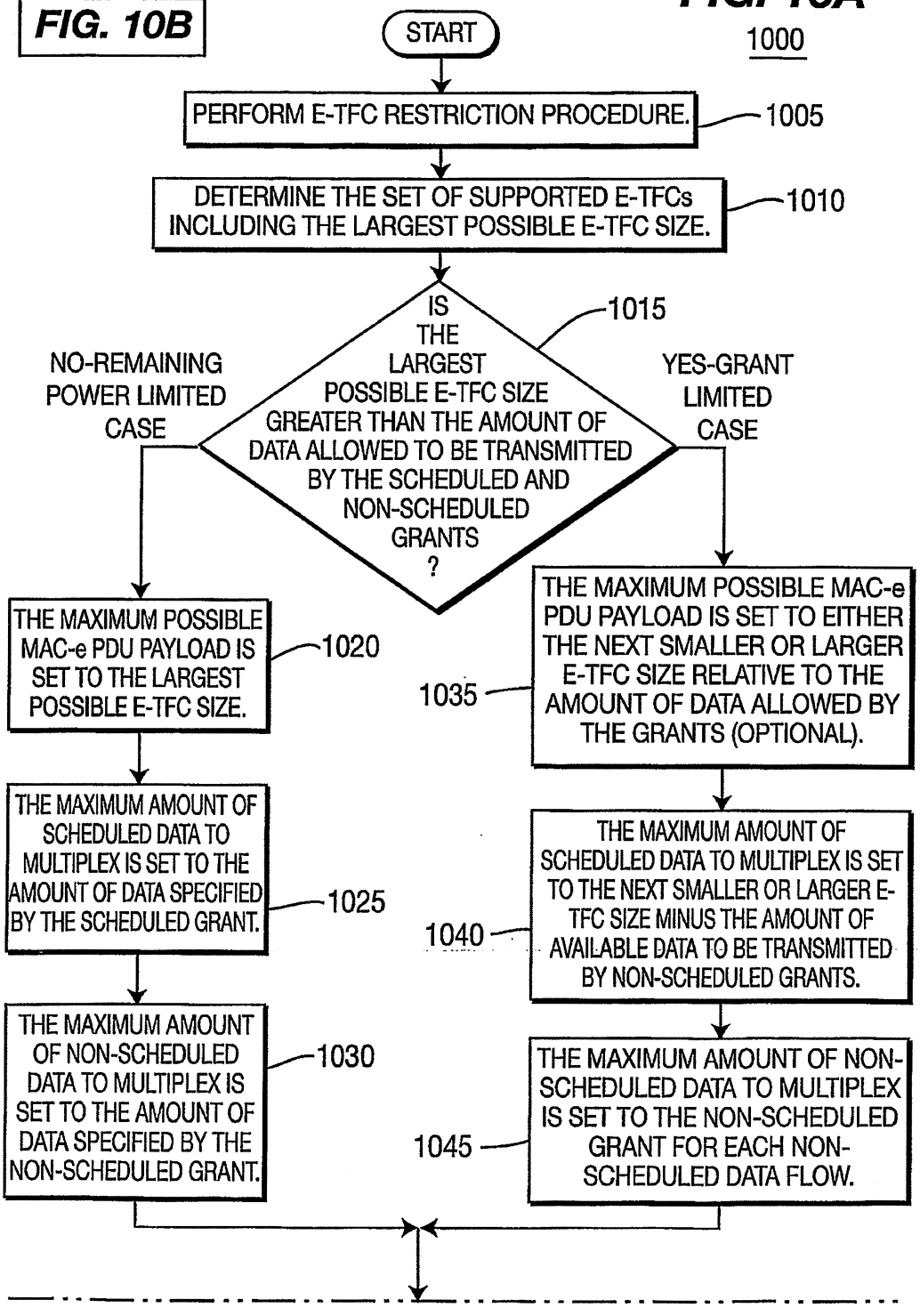

850
START
SELECT THE SMALLEST E-TFC REQUIRED TO SUPPORT THE AMOUNT OF DATA ALLOWED TO BE MULTIPLEXED ACCORDING TO THE CURRENT SCHEDULED AND NON-SCHEDULED GRANTS FROM THE SET OF SUPPORTED E-TFCs.
852
MULTIPLEX MAC-d FLOW DATA BLOCKS INTO A MAC-e PDU IN THE ORDER OF ABSOLUTE PRIORITY UNTIL THE MAXIMUM AMOUNT OF DATA ALLOWED BY THE SELECTED E-TFC SIZE IS REACHED.
854
PAD THE MAC-e TO MATCH THE SELECTED E-TFC SIZE.
856
END

FIG. 8B

FIG. 10

FIG. 10A

FIG. 10B



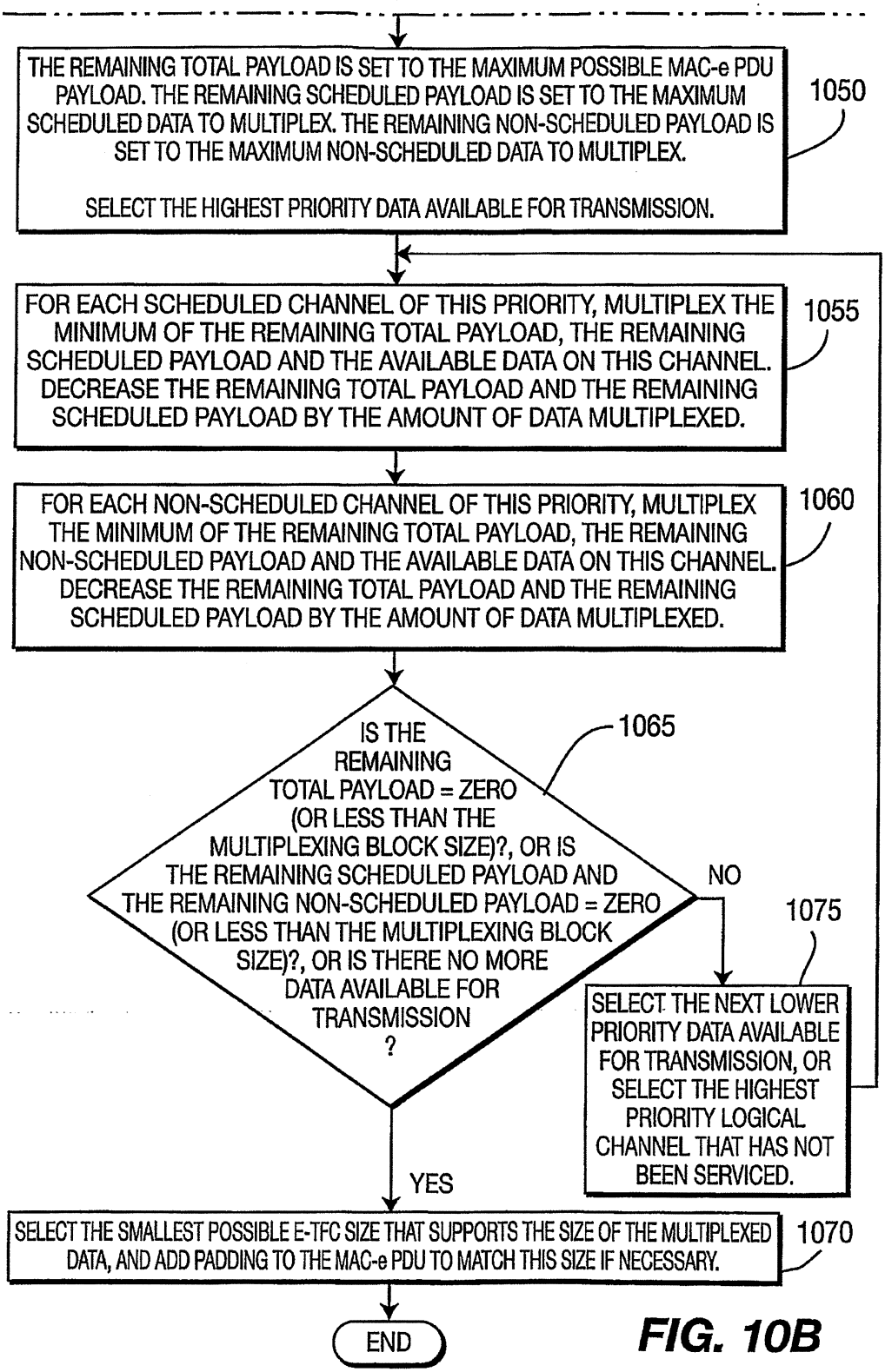

THE REMAINING TOTAL PAYLOAD IS SET TO THE MAXIMUM POSSIBLE MAC-e PDU PAYLOAD. THE REMAINING SCHEDULED PAYLOAD IS SET TO THE MAXIMUM SCHEDULED DATA TO MULTIPLEX. THE REMAINING NON-SCHEDULED PAYLOAD IS SET TO THE MAXIMUM NON-SCHEDULED DATA TO MULTIPLEX.
SELECT THE HIGHEST PRIORITY DATA AVAILABLE FOR TRANSMISSION.
1050
FOR EACH SCHEDULED CHANNEL OF THIS PRIORITY, MULTIPLEX THE MINIMUM OF THE REMAINING TOTAL PAYLOAD, THE REMAINING SCHEDULED PAYLOAD AND THE AVAILABLE DATA ON THIS CHANNEL. DECREASE THE REMAINING TOTAL PAYLOAD AND THE REMAINING SCHEDULED PAYLOAD BY THE AMOUNT OF DATA MULTIPLEXED.
1055
FOR EACH NON-SCHEDULED CHANNEL OF THIS PRIORITY, MULTIPLEX THE MINIMUM OF THE REMAINING TOTAL PAYLOAD, THE REMAINING NON-SCHEDULED PAYLOAD AND THE AVAILABLE DATA ON THIS CHANNEL. DECREASE THE REMAINING TOTAL PAYLOAD AND THE REMAINING SCHEDULED PAYLOAD BY THE AMOUNT OF DATA MULTIPLEXED.
1060
IS THE REMAINING TOTAL PAYLOAD = ZERO (OR LESS THAN THE MULTIPLEXING BLOCK SIZE)?, OR IS THE REMAINING SCHEDULED PAYLOAD AND THE REMAINING NON-SCHEDULED PAYLOAD = ZERO (OR LESS THAN THE MULTIPLEXING BLOCK SIZE)?, OR IS THERE NO MORE DATA AVAILABLE FOR TRANSMISSION ?
1065
NO
1075
SELECT THE NEXT LOWER PRIORITY DATA AVAILABLE FOR TRANSMISSION, OR SELECT THE HIGHEST PRIORITY LOGICAL CHANNEL THAT HAS NOT BEEN SERVICED.
YES
SELECT THE SMALLEST POSSIBLE E-TFC SIZE THAT SUPPORTS THE SIZE OF THE MULTIPLEXED DATA, AND ADD PADDING TO THE MAC-e PDU TO MATCH THIS SIZE IF NECESSARY.
1070
END

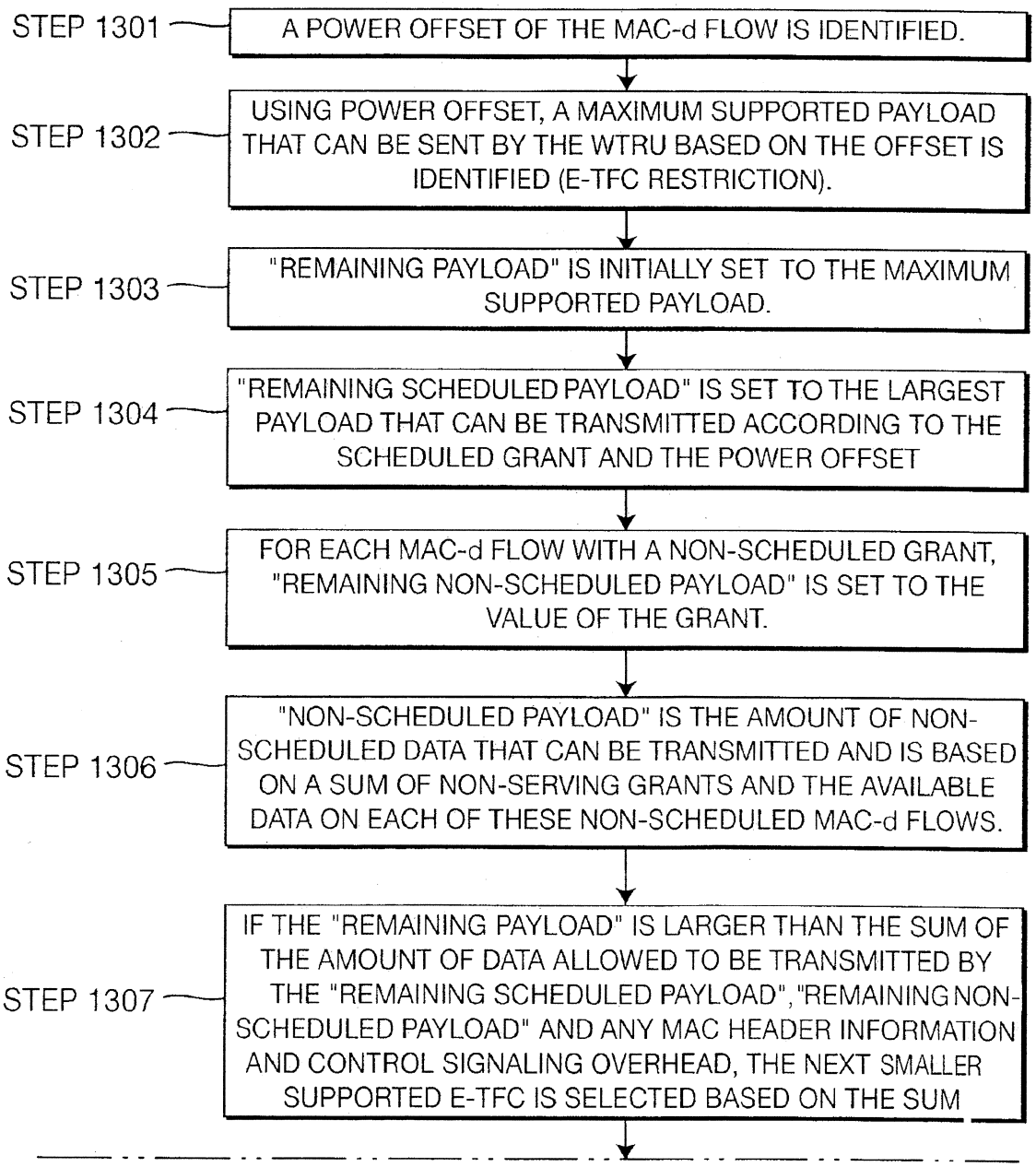
FIG. 10B

FIG. 11

FIG. 11A

FIG. 11B

FIG. 11A



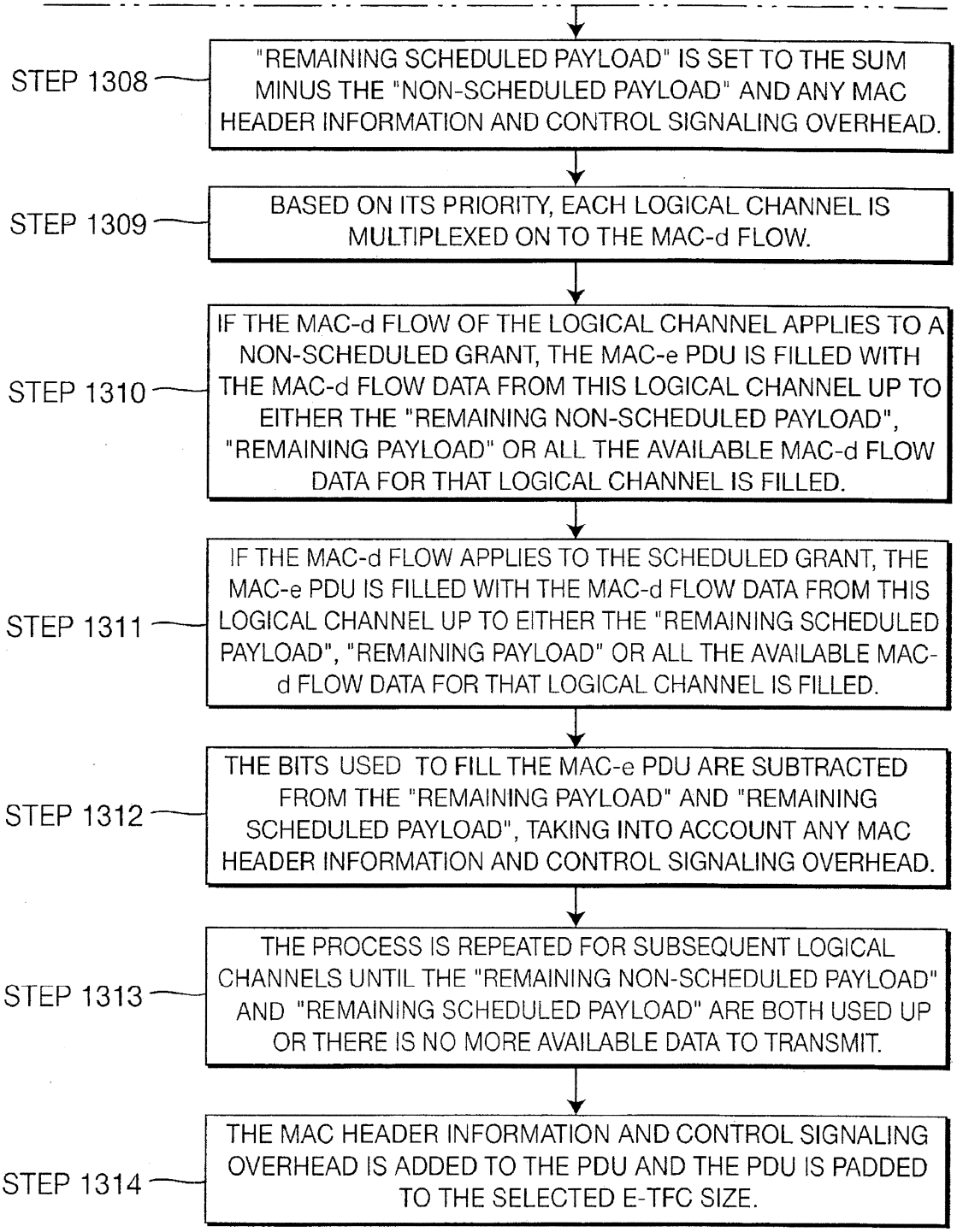

STEP 1308
"REMAINING SCHEDULED PAYLOAD" IS SET TO THE SUM MINUS THE "NON-SCHEDULED PAYLOAD" AND ANY MAC HEADER INFORMATION AND CONTROL SIGNALING OVERHEAD.
STEP 1309
BASED ON ITS PRIORITY, EACH LOGICAL CHANNEL IS MULTIPLEXED ON TO THE MAC-d FLOW.
STEP 1310
IF THE MAC-d FLOW OF THE LOGICAL CHANNEL APPLIES TO A NON-SCHEDULED GRANT, THE MAC-e PDU IS FILLED WITH THE MAC-d FLOW DATA FROM THIS LOGICAL CHANNEL UP TO EITHER THE "REMAINING NON-SCHEDULED PAYLOAD", "REMAINING PAYLOAD" OR ALL THE AVAILABLE MAC-d FLOW DATA FOR THAT LOGICAL CHANNEL IS FILLED.
STEP 1311
IF THE MAC-d FLOW APPLIES TO THE SCHEDULED GRANT, THE MAC-e PDU IS FILLED WITH THE MAC-d FLOW DATA FROM THIS LOGICAL CHANNEL UP TO EITHER THE "REMAINING SCHEDULED PAYLOAD", "REMAINING PAYLOAD" OR ALL THE AVAILABLE MAC-d FLOW DATA FOR THAT LOGICAL CHANNEL IS FILLED.
STEP 1312
THE BITS USED TO FILL THE MAC-e PDU ARE SUBTRACTED FROM THE "REMAINING PAYLOAD" AND "REMAINING SCHEDULED PAYLOAD", TAKING INTO ACCOUNT ANY MAC HEADER INFORMATION AND CONTROL SIGNALING OVERHEAD.
STEP 1313
THE PROCESS IS REPEATED FOR SUBSEQUENT LOGICAL CHANNELS UNTIL THE "REMAINING NON-SCHEDULED PAYLOAD" AND "REMAINING SCHEDULED PAYLOAD" ARE BOTH USED UP OR THERE IS NO MORE AVAILABLE DATA TO TRANSMIT.
STEP 1314
THE MAC HEADER INFORMATION AND CONTROL SIGNALING OVERHEAD IS ADDED TO THE PDU AND THE PDU IS PADDED TO THE SELECTED E-TFC SIZE.

FIG. 11B

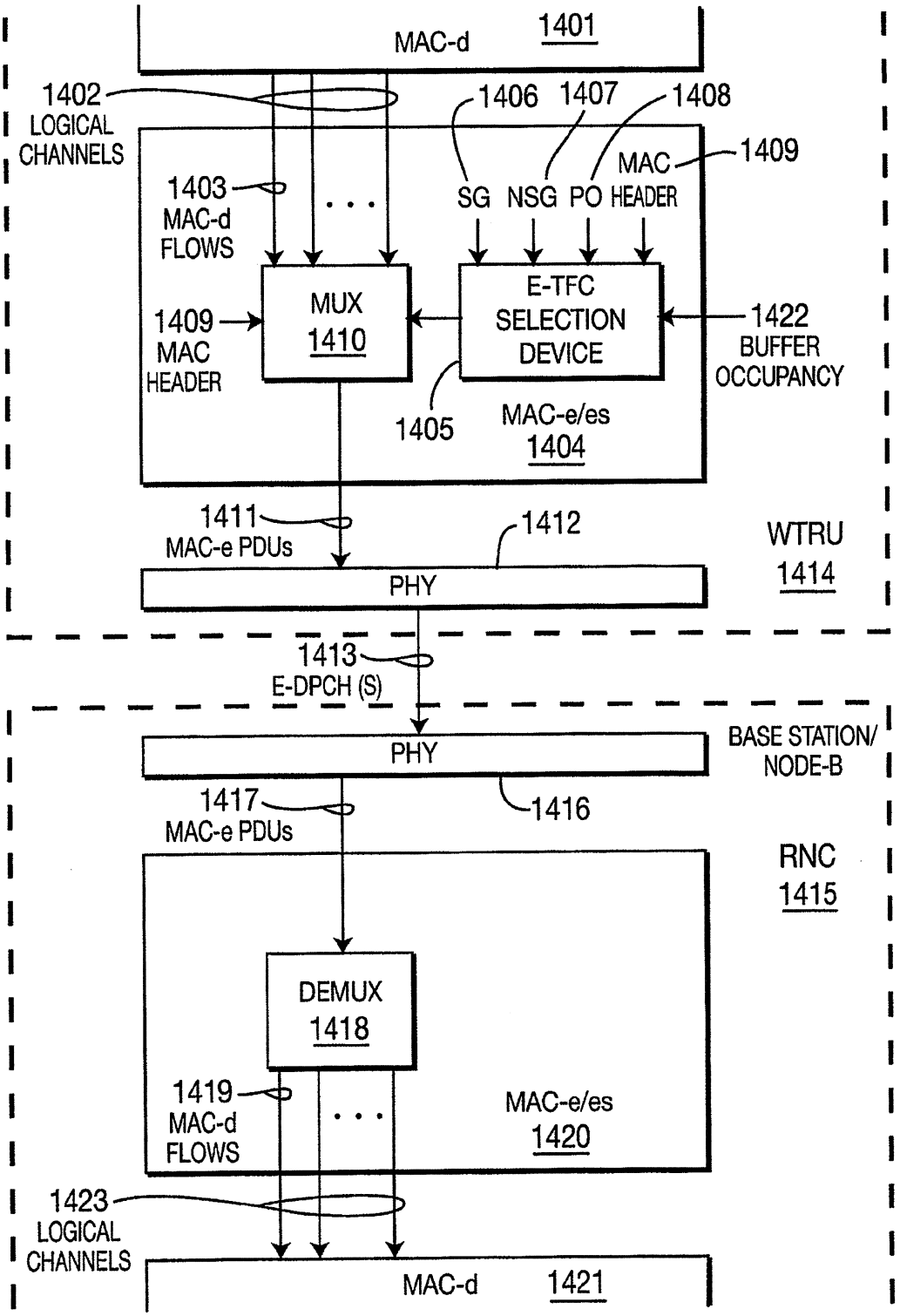

MAC-d
1401
1402
LOGICAL
CHANNELS
1406
1407
1408
MAC
1409
1403
MAC-d
FLOWS
SG
NSG
PO
HEADER
MUX
1410
E-TFC
SELECTION
DEVICE
1422
BUFFER
OCCUPANCY
1409
MAC
HEADER
1405
MAC-e/es
1404
1411
MAC-e PDUs
1412
WTRU
1414
PHY
1413
E-DPCH (S)
PHY
BASE STATION/
NODE-B
1417
MAC-e PDUs
1416
RNC
1415
DEMUX
1418
1419
MAC-d
FLOWS
MAC-e/es
1420
1423
LOGICAL
CHANNELS
MAC-d
1421

FIG. 12

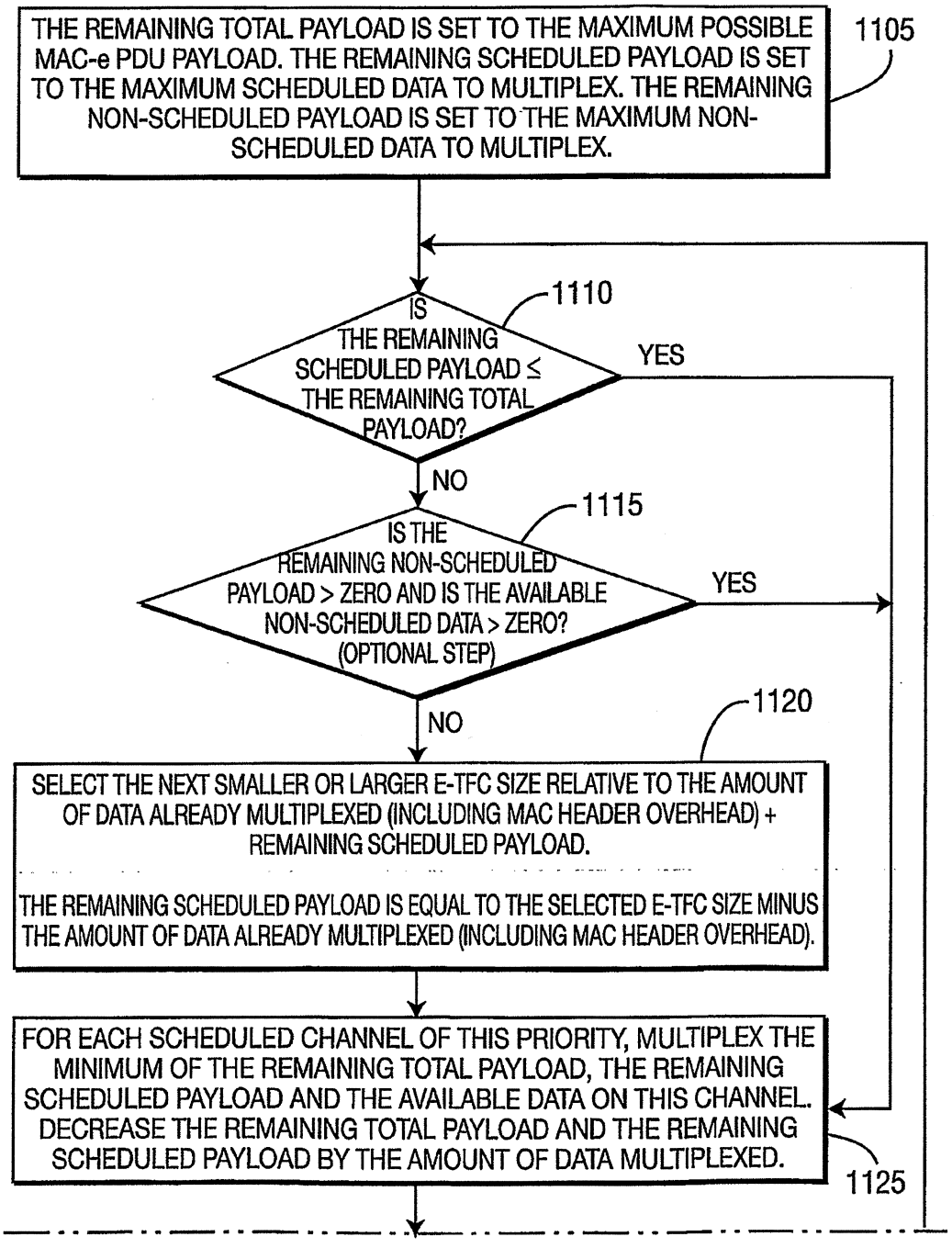
FIG. 13

FIG. 13A

FIG. 13B

FIG. 13A

1100



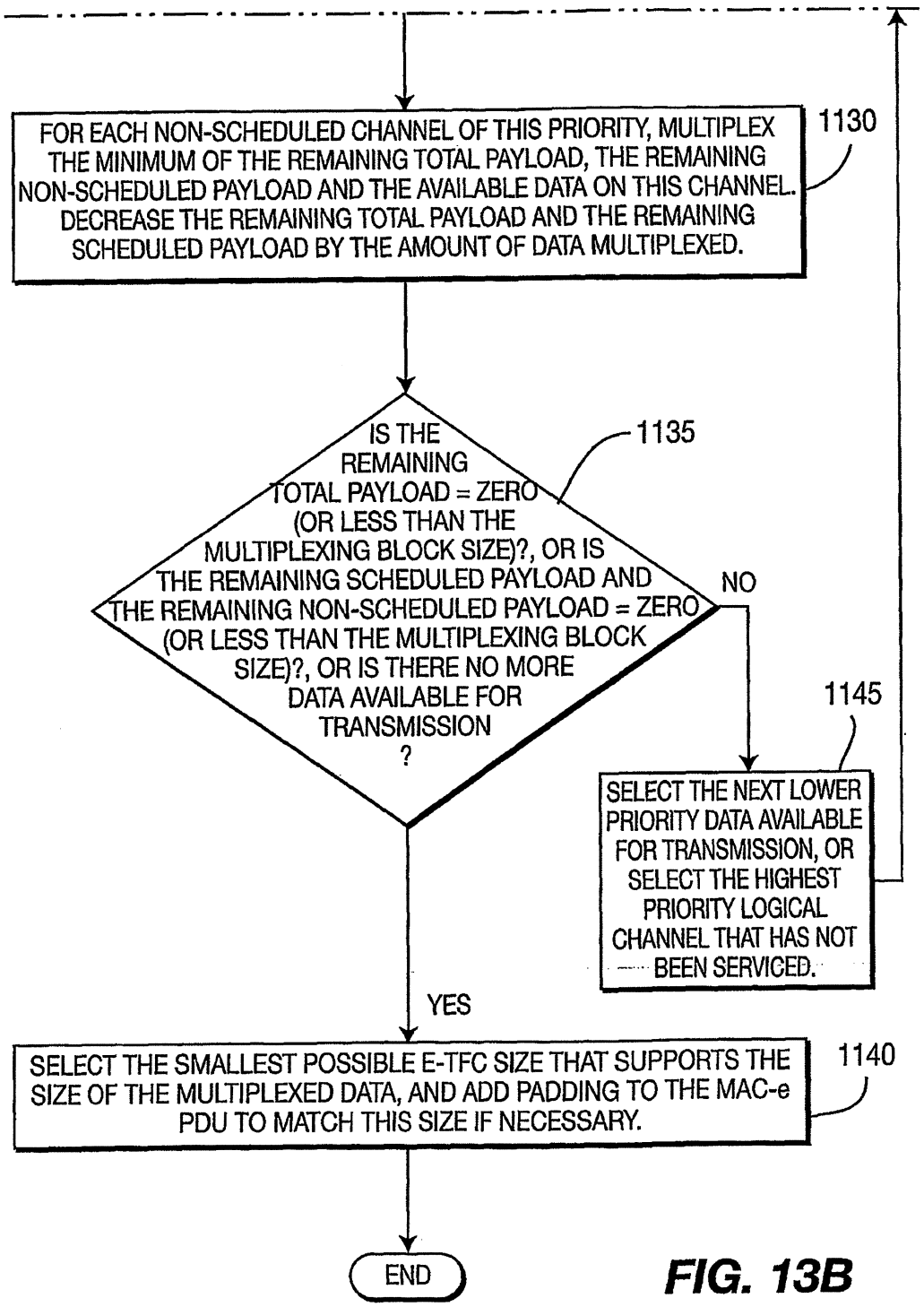

FOR EACH NON-SCHEDULED CHANNEL OF THIS PRIORITY, MULTIPLEX THE MINIMUM OF THE REMAINING TOTAL PAYLOAD, THE REMAINING NON-SCHEDULED PAYLOAD AND THE AVAILABLE DATA ON THIS CHANNEL. DECREASE THE REMAINING TOTAL PAYLOAD AND THE REMAINING SCHEDULED PAYLOAD BY THE AMOUNT OF DATA MULTIPLEXED.
1130
IS THE REMAINING TOTAL PAYLOAD = ZERO (OR LESS THAN THE MULTIPLEXING BLOCK SIZE)?, OR IS THE REMAINING SCHEDULED PAYLOAD AND THE REMAINING NON-SCHEDULED PAYLOAD = ZERO (OR LESS THAN THE MULTIPLEXING BLOCK SIZE)?, OR IS THERE NO MORE DATA AVAILABLE FOR TRANSMISSION ?
1135
NO
YES
SELECT THE NEXT LOWER PRIORITY DATA AVAILABLE FOR TRANSMISSION, OR SELECT THE HIGHEST PRIORITY LOGICAL CHANNEL THAT HAS NOT BEEN SERVICED.
1145
SELECT THE SMALLEST POSSIBLE E-TFC SIZE THAT SUPPORTS THE SIZE OF THE MULTIPLEXED DATA, AND ADD PADDING TO THE MAC-e PDU TO MATCH THIS SIZE IF NECESSARY.
1140
END

FIG. 13B

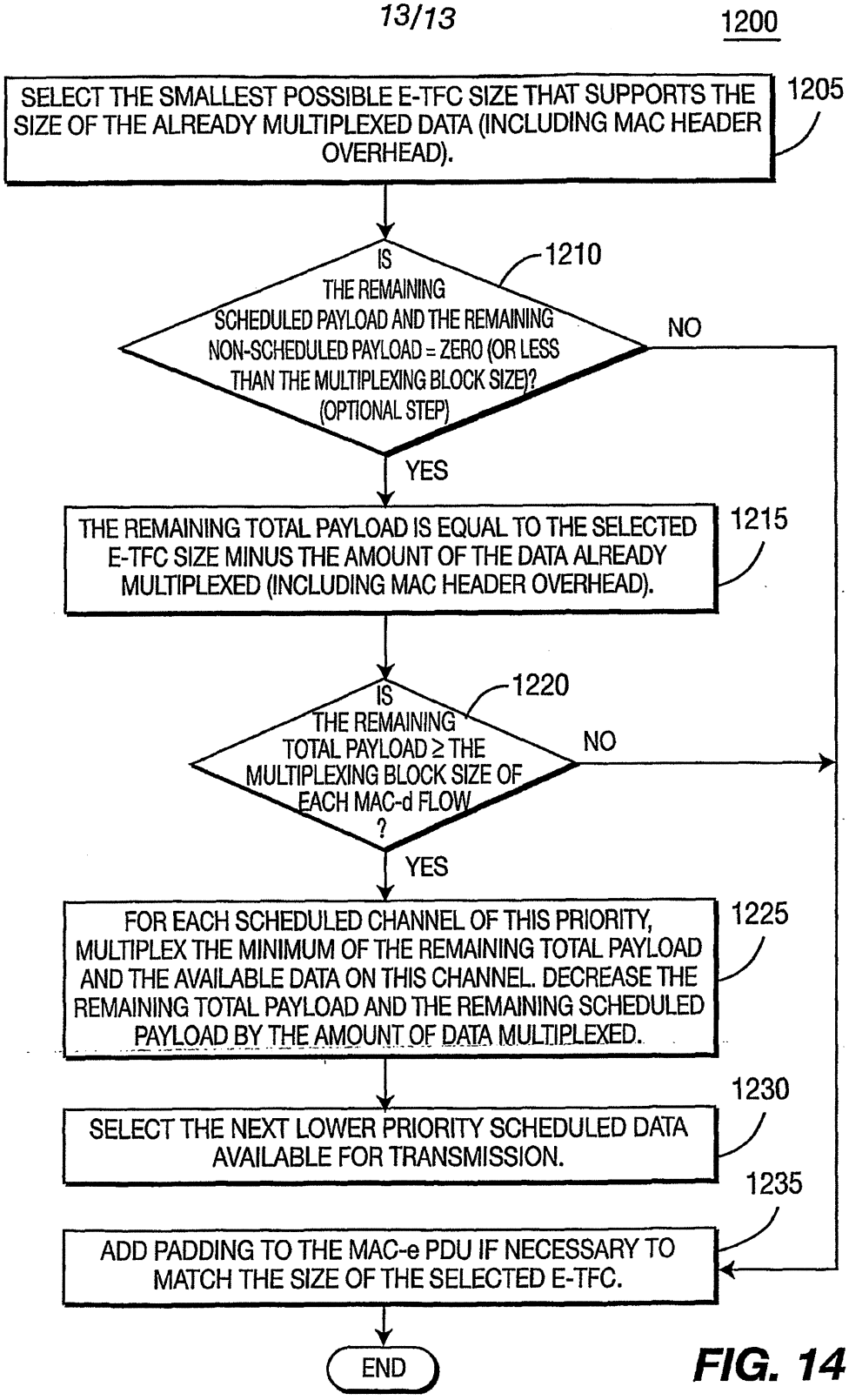

1200
SELECT THE SMALLEST POSSIBLE E-TFC SIZE THAT SUPPORTS THE SIZE OF THE ALREADY MULTIPLEXED DATA (INCLUDING MAC HEADER OVERHEAD).
1205
IS THE REMAINING SCHEDULED PAYLOAD AND THE REMAINING NON-SCHEDULED PAYLOAD = ZERO (OR LESS THAN THE MULTIPLEXING BLOCK SIZE)? (OPTIONAL STEP)
1210
NO
YES
THE REMAINING TOTAL PAYLOAD IS EQUAL TO THE SELECTED E-TFC SIZE MINUS THE AMOUNT OF THE DATA ALREADY MULTIPLEXED (INCLUDING MAC HEADER OVERHEAD).
1215
IS THE REMAINING TOTAL PAYLOAD ≥ THE MULTIPLEXING BLOCK SIZE OF EACH MAC-d FLOW ?
1220
NO
YES
FOR EACH SCHEDULED CHANNEL OF THIS PRIORITY, MULTIPLEX THE MINIMUM OF THE REMAINING TOTAL PAYLOAD AND THE AVAILABLE DATA ON THIS CHANNEL. DECREASE THE REMAINING TOTAL PAYLOAD AND THE REMAINING SCHEDULED PAYLOAD BY THE AMOUNT OF DATA MULTIPLEXED.
1225
SELECT THE NEXT LOWER PRIORITY SCHEDULED DATA AVAILABLE FOR TRANSMISSION.
1230
ADD PADDING TO THE MAC-e PDU IF NECESSARY TO MATCH THE SIZE OF THE SELECTED E-TFC.
1235
END

FIG. 14