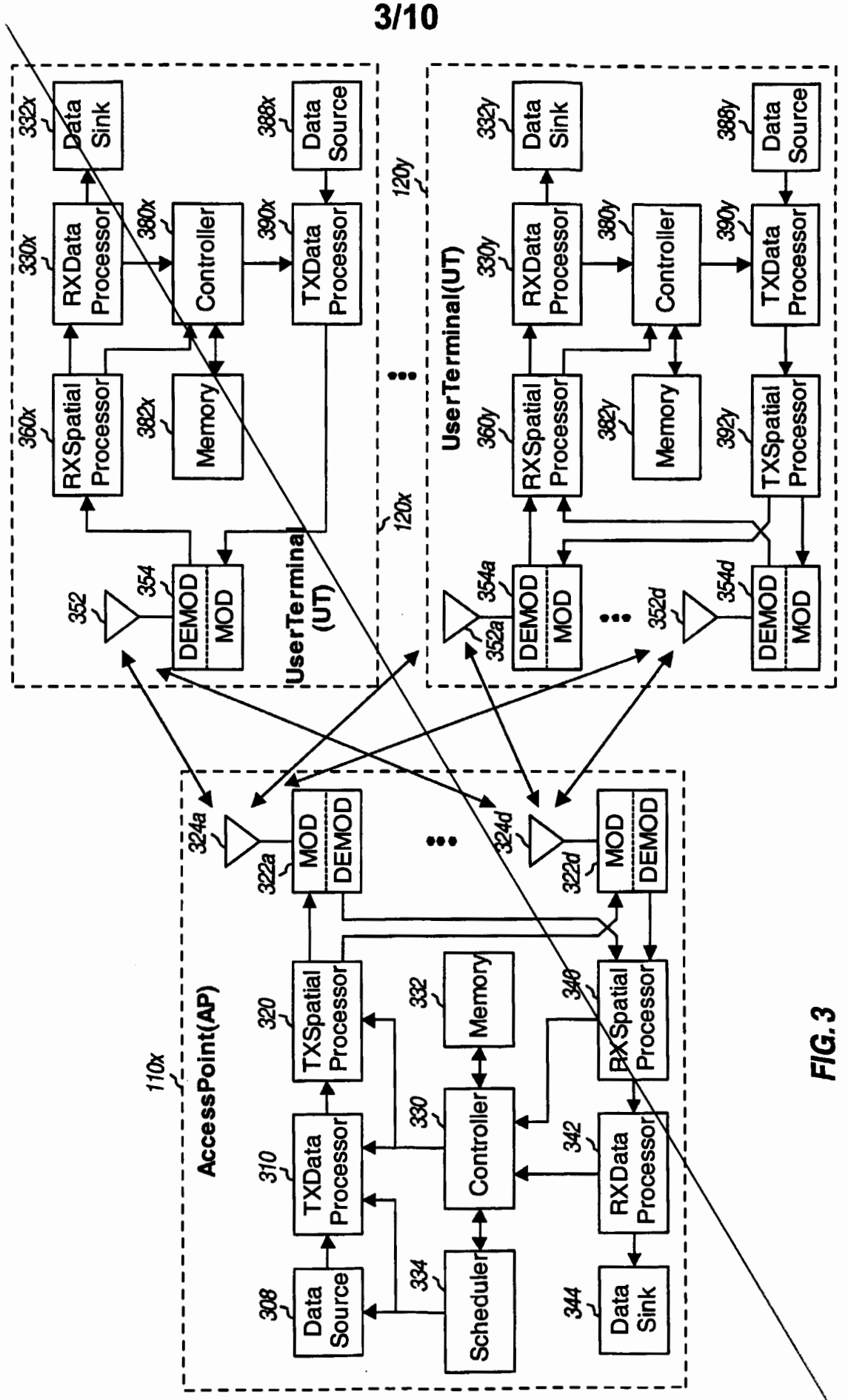

AccessPoint(AP)
110x
UserTerminal (UT)
120x
UserTerminal(UT)
120y
Data Sink
332x
RXData Processor
330x
RXSpatial Processor
360x
Memory
382x
Controller
380x
TXData Processor
390x
Data Source
388x
DEMOD
MOD
354
352
Data Sink
332y
RXData Processor
330y
RXSpatial Processor
360y
Memory
382y
Controller
380y
TXData Processor
390y
TXSpatial Processor
392y
Data Source
388y
DEMOD
MOD
354a
352a
354d
352d
MOD
DEMOD
322a
324a
322d
324d
TXSpatial Processor
320
TXData Processor
310
Data Source
308
Memory
332
Controller
330
Scheduler
334
RXSpatial Processor
340
RXData Processor
342
Data Sink
344

FIG. 3

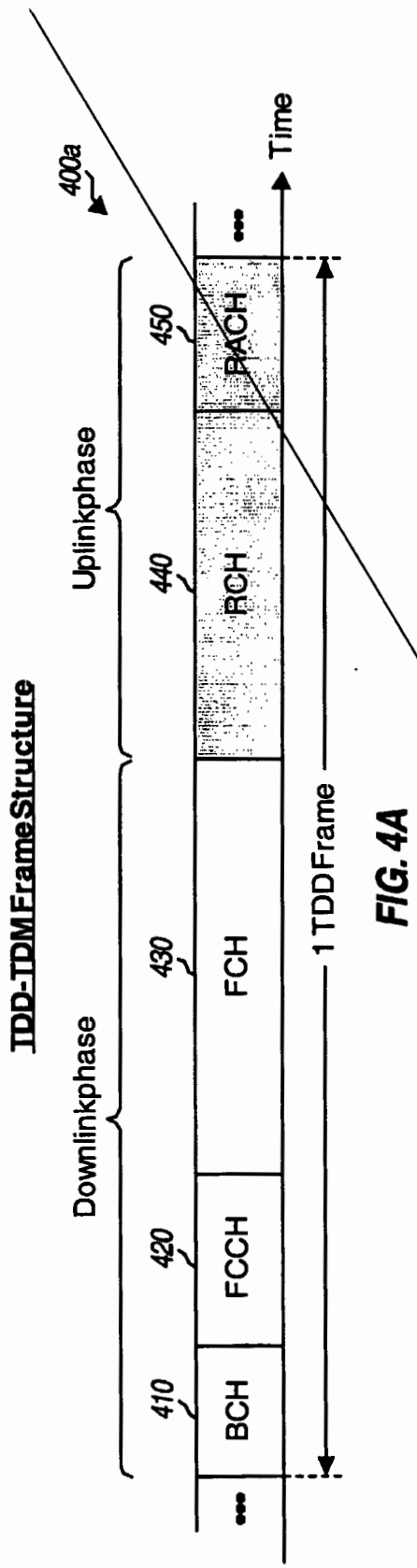

TDD-TDM Frame Structure
400a
Time
Uplinkphase
Downlinkphase
450
RACH
440
RCH
430
FCH
420
FCCH
410
BCH
1 TDD Frame

FIG. 4A

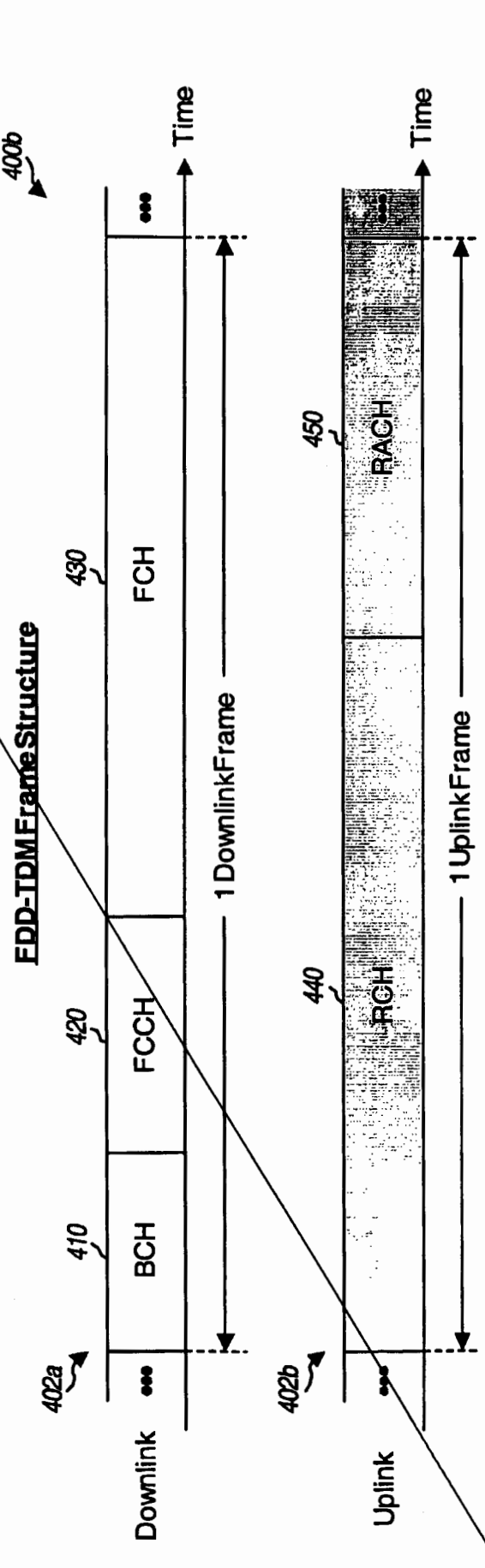

FDD-TDM Frame Structure
400b
Time
430
FCH
420
FCCH
410
BCH
1 Downlink Frame
402a
Downlink
450
RACH
440
RCH
1 Uplink Frame
402b
Uplink

FIG. 4B

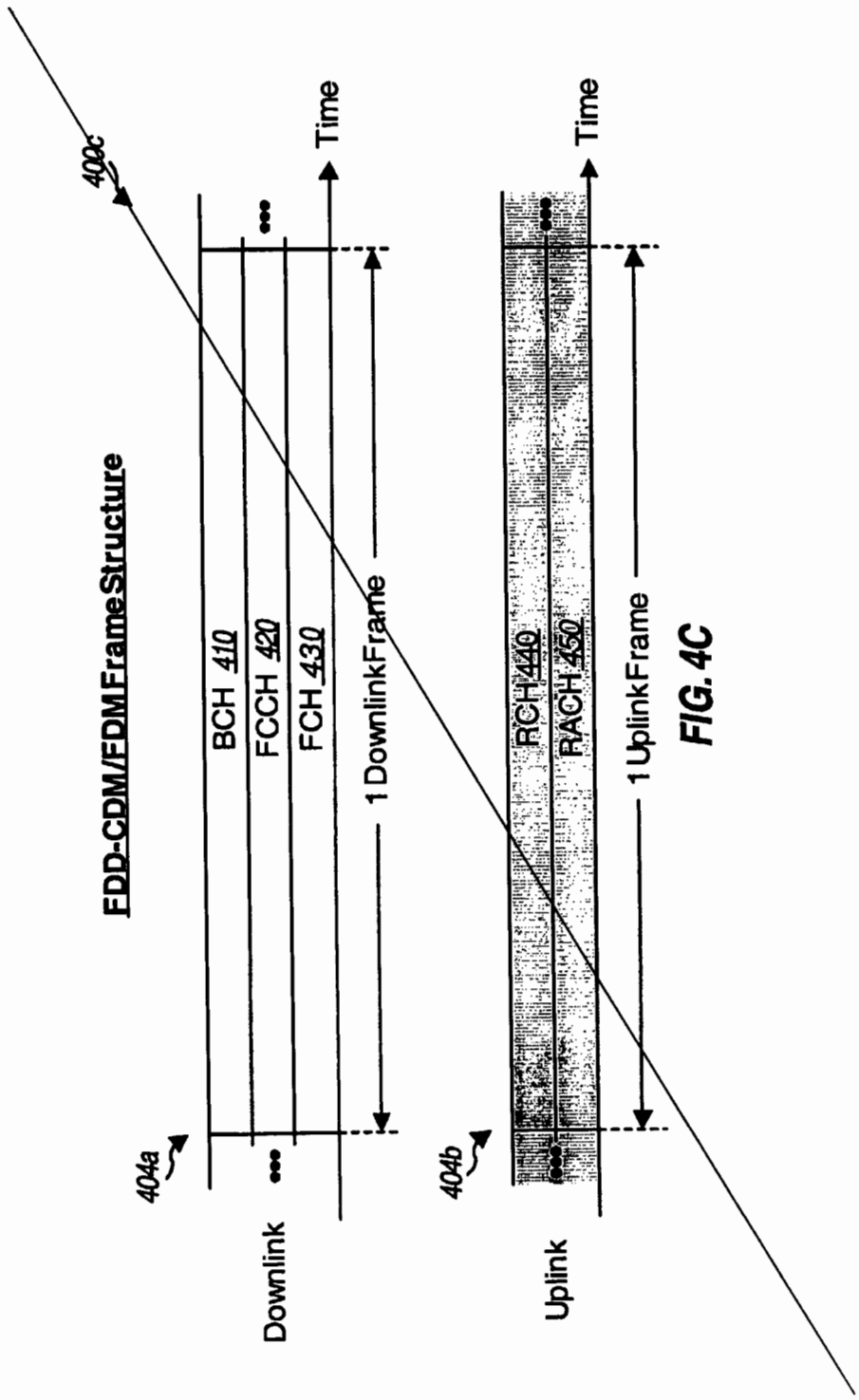

FDD-CDM/FDM Frame Structure
400c
Time
BCH 410
FCCH 420
FCH 430
1 Downlink Frame
404a
Downlink
Time
RCH 440
RACH 450
1 Uplink Frame
404b
Uplink

FIG. 4C

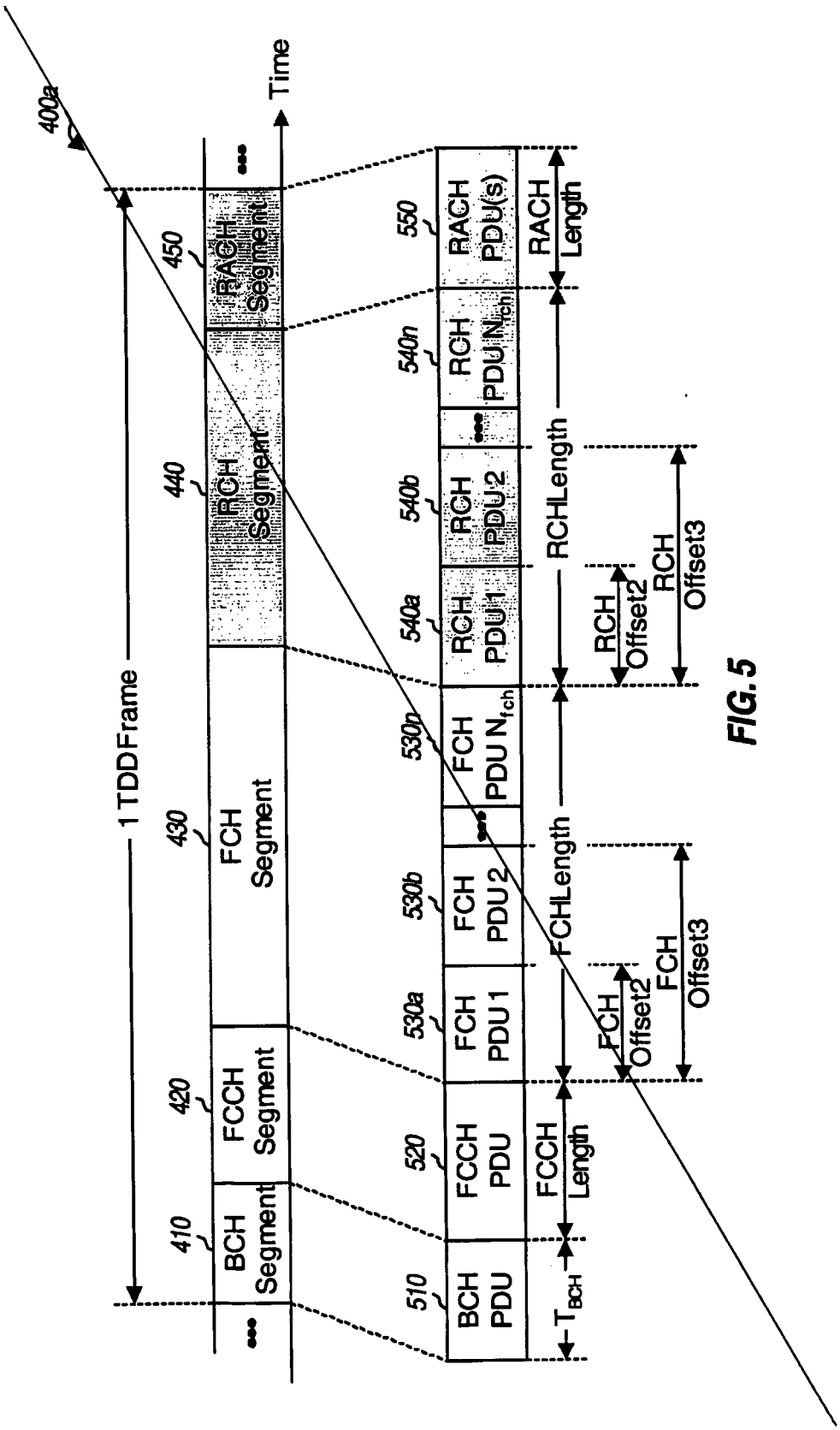

400a
Time
1 TDDFrame
410
BCH Segment
420
FCCH Segment
430
FCH Segment
440
RCH Segment
450
RACH Segment
510
BCH PDU
520
FCCH PDU
530a
FCH PDU 1
530b
FCH PDU 2
530n
FCH PDU Nfch
540a
RCH PDU 1
540b
RCH PDU 2
540n
RCH PDU Nrch
550
RACH PDU(s)
TBCH
FCCH Length
FCHLength
RCHLength
RACH Length
FCH Offset2
FCH Offset3
RCH Offset2
RCH Offset3

FIG. 5

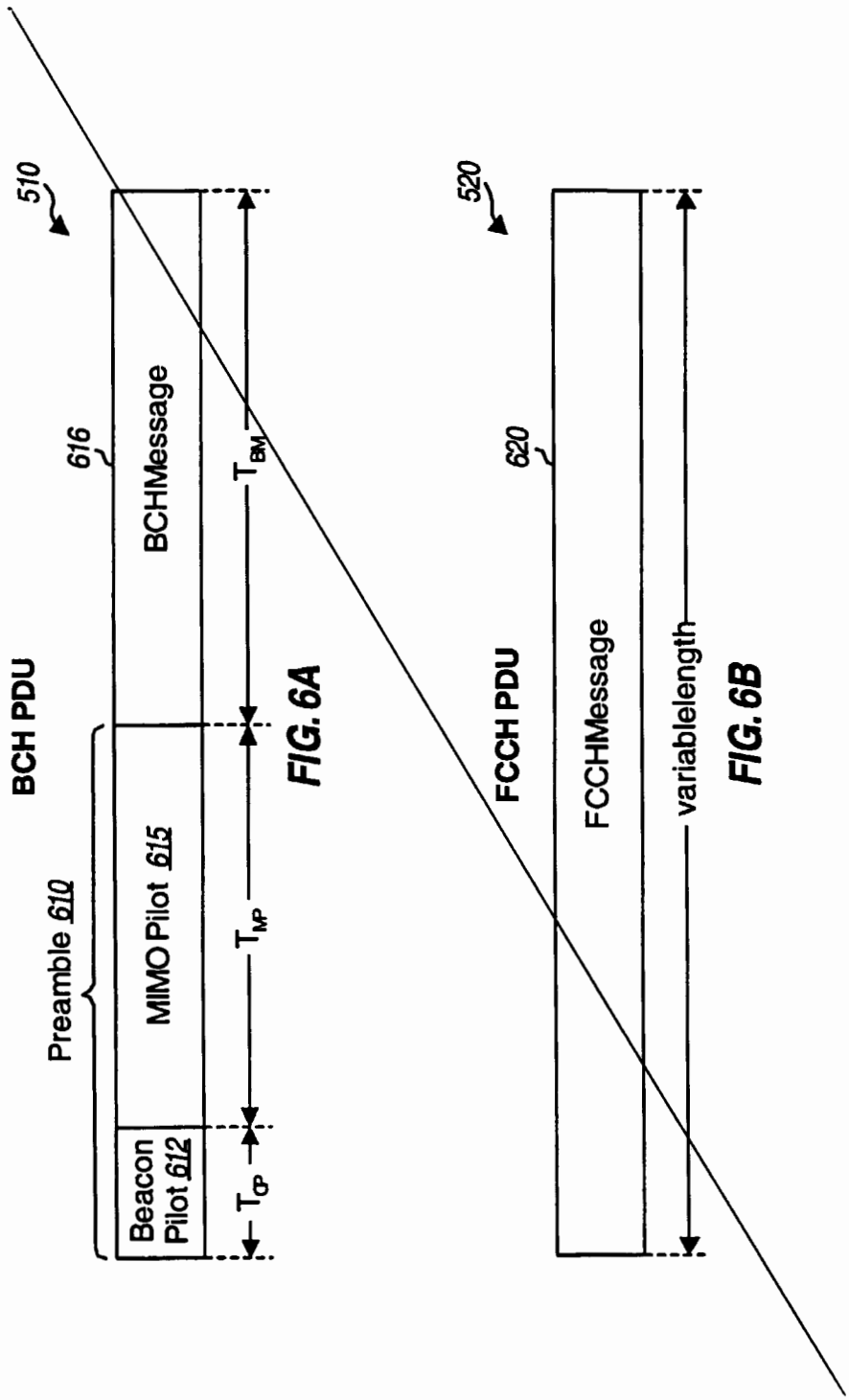

510
BCH PDU
Preamble 610
Beacon Pilot 612
MIMO Pilot 615
616
BCHMessage
T_{CP}
T_{MP}
T_{BM}
520
FCCH PDU
620
FCCHMessage
variablelength

FIG. 6A

FIG. 6B

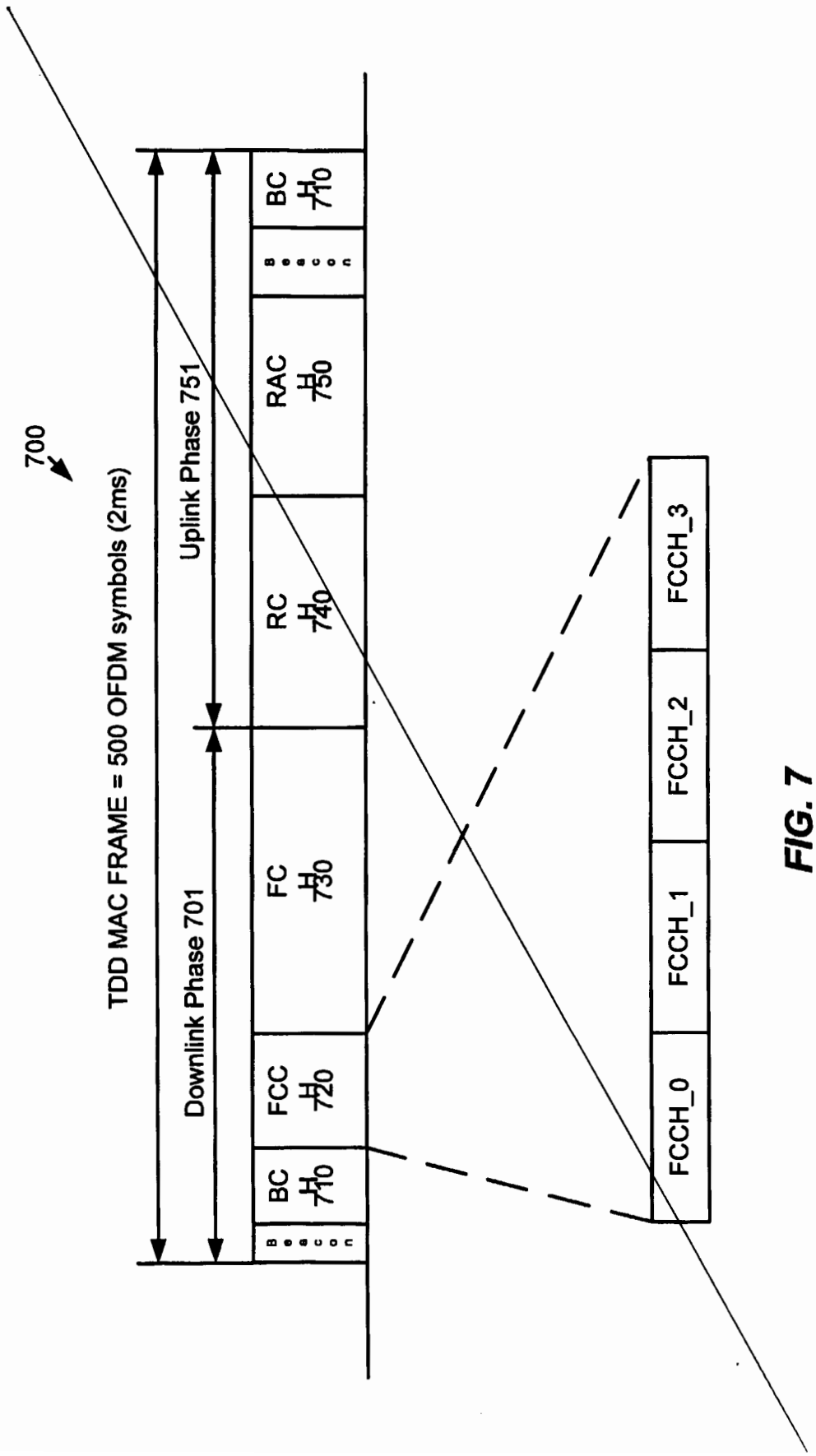

700
TDD MAC FRAME = 500 OFDM symbols (2ms)
Uplink Phase 751
Downlink Phase 701
BC 710
Beacon
FCC 720
FC 730
RC 740
RAC 750
FCCH_0
FCCH_1
FCCH_2
FCCH_3

FIG. 7

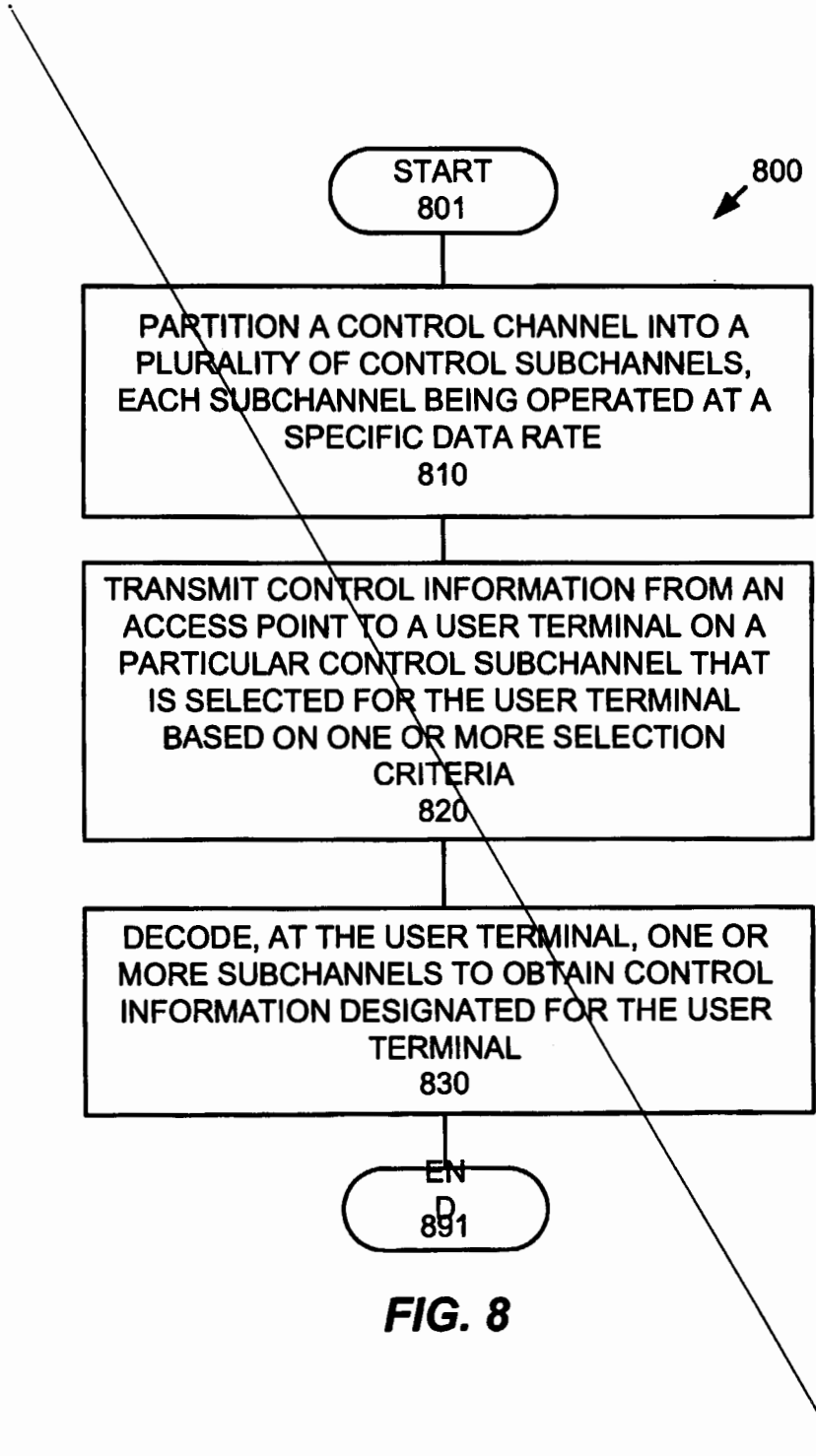

START
801
800
PARTITION A CONTROL CHANNEL INTO A PLURALITY OF CONTROL SUBCHANNELS, EACH SUBCHANNEL BEING OPERATED AT A SPECIFIC DATA RATE
810
TRANSMIT CONTROL INFORMATION FROM AN ACCESS POINT TO A USER TERMINAL ON A PARTICULAR CONTROL SUBCHANNEL THAT IS SELECTED FOR THE USER TERMINAL BASED ON ONE OR MORE SELECTION CRITERIA
820
DECODE, AT THE USER TERMINAL, ONE OR MORE SUBCHANNELS TO OBTAIN CONTROL INFORMATION DESIGNATED FOR THE USER TERMINAL
830
END
891

FIG. 8

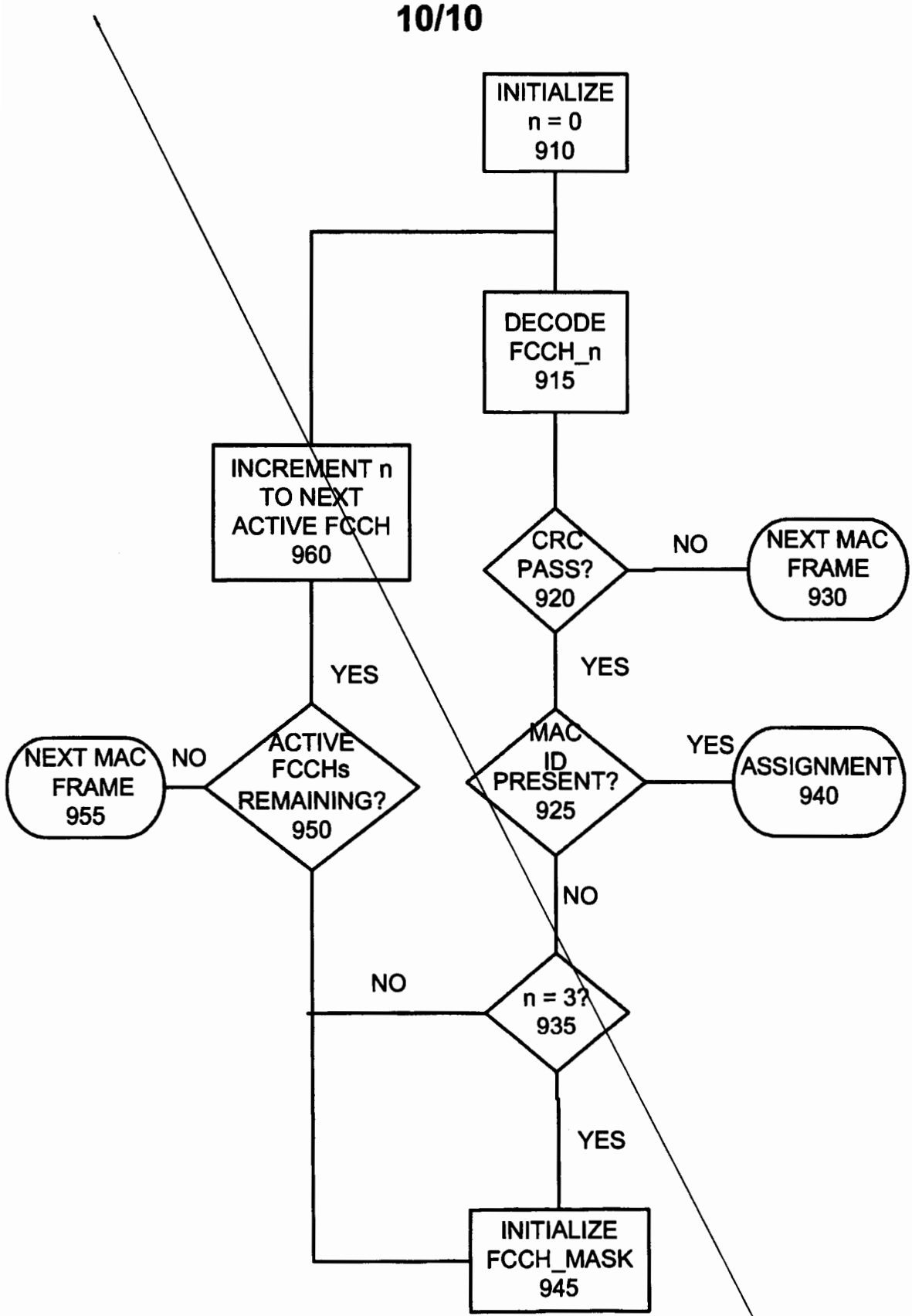

INITIALIZE
n = 0
910
DECODE
FCCH_n
915
CRC
PASS?
920
NO
NEXT MAC
FRAME
930
YES
MAC
ID
PRESENT?
925
YES
ASSIGNMENT
940
NO
n = 3?
935
NO
YES
INITIALIZE
FCCH_MASK
945
INCREMENT n
TO NEXT
ACTIVE FCCH
960
YES
ACTIVE
FCCHs
REMAINING?
950
NO
NEXT MAC
FRAME
955

FIG. 9

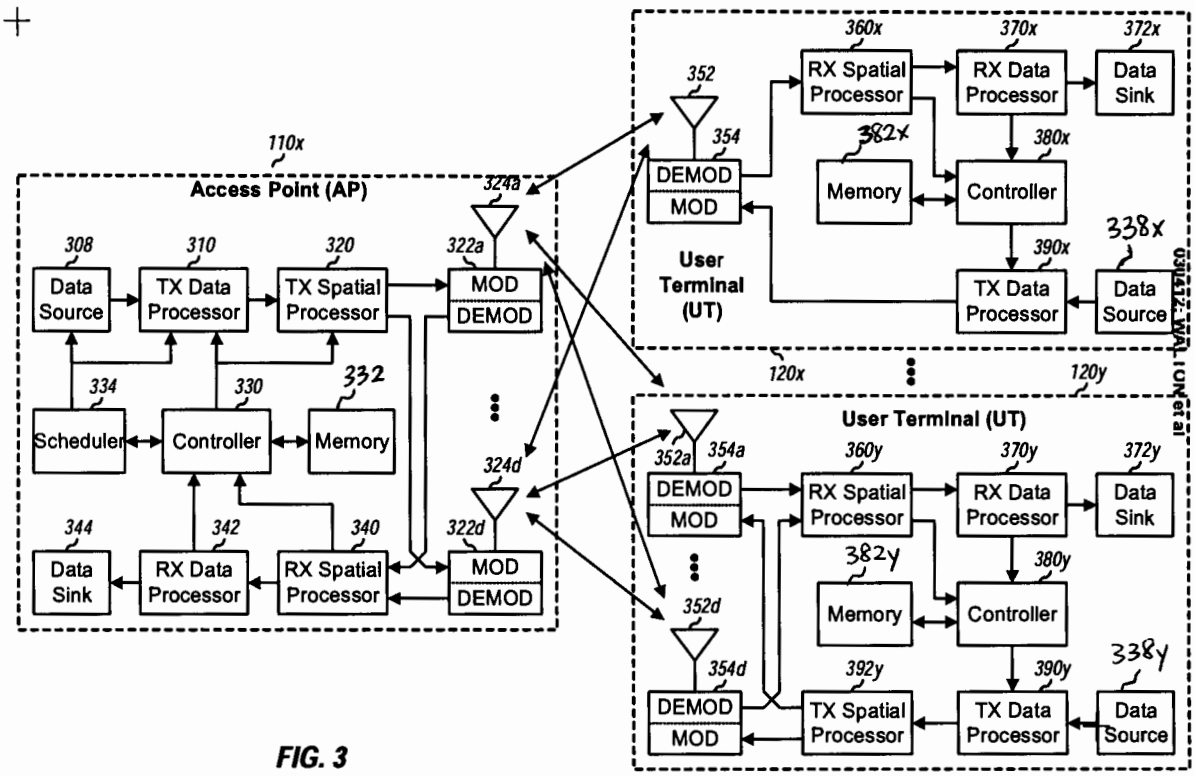

110x
Access Point (AP)
308
Data Source
310
TX Data Processor
320
TX Spatial Processor
322a
MOD
DEMOD
324a
334
Scheduler
330
Controller
332
Memory
344
Data Sink
342
RX Data Processor
340
RX Spatial Processor
322d
MOD
DEMOD
324d
352
354
DEMOD
MOD
User Terminal (UT)
360x
RX Spatial Processor
370x
RX Data Processor
372x
Data Sink
382x
Memory
380x
Controller
390x
TX Data Processor
338x
Data Source
120x
120y
User Terminal (UT)
352a
354a
352d
354d
360y
RX Spatial Processor
370y
RX Data Processor
372y
Data Sink
382y
Memory
380y
Controller
392y
TX Spatial Processor
390y
TX Data Processor
338y
Data Source

FIG. 3

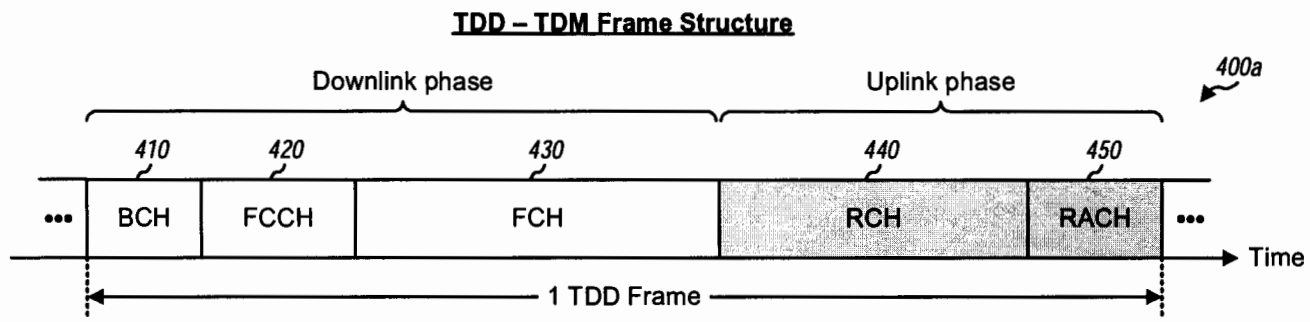

TDD – TDM Frame Structure
Downlink phase
Uplink phase
400a
410
420
430
440
450
BCH
FCCH
FCH
RCH
RACH
Time
1 TDD Frame

FIG. 4A

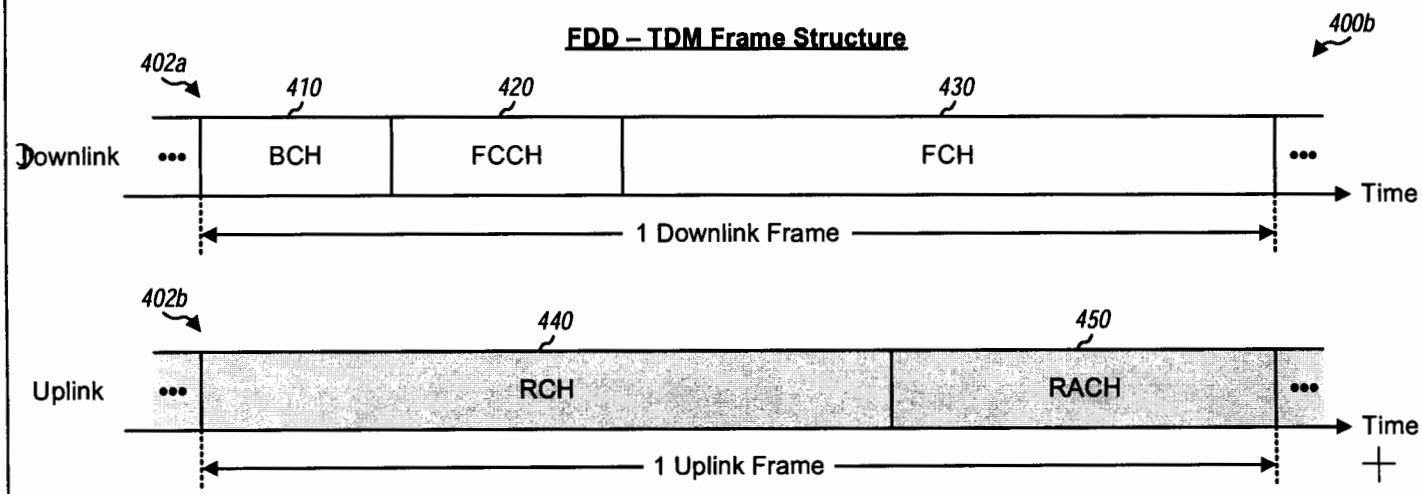

FDD – TDM Frame Structure
400b
402a
410
420
430
Downlink
BCH
FCCH
FCH
Time
1 Downlink Frame
402b
440
450
Uplink
RCH
RACH
Time
1 Uplink Frame

FIG. 4B

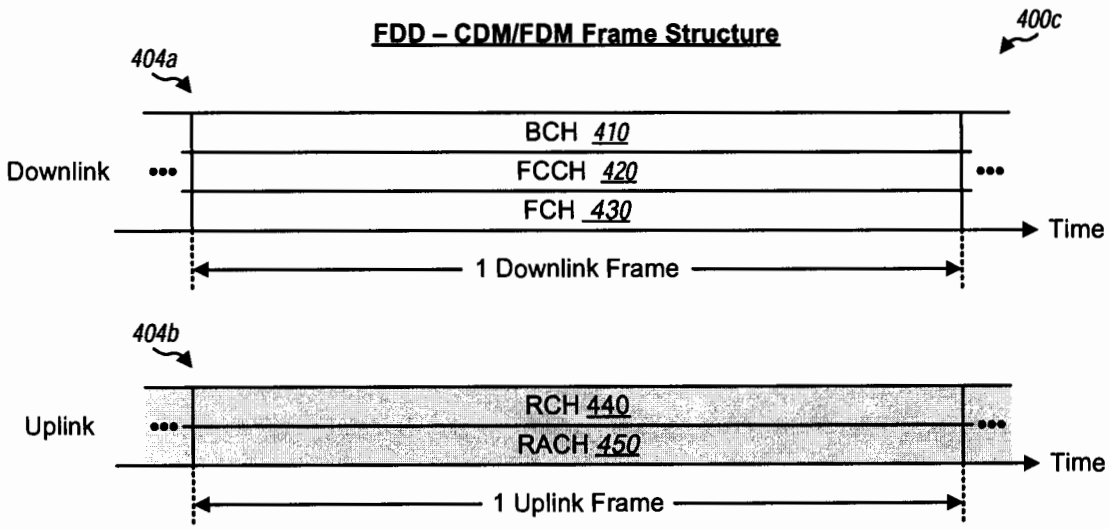

FDD – CDM/FDM Frame Structure
400c
404a
Downlink
BCH 410
FCCH 420
FCH 430
Time
1 Downlink Frame
404b
Uplink
RCH 440
RACH 450
Time
1 Uplink Frame

FIG. 4C

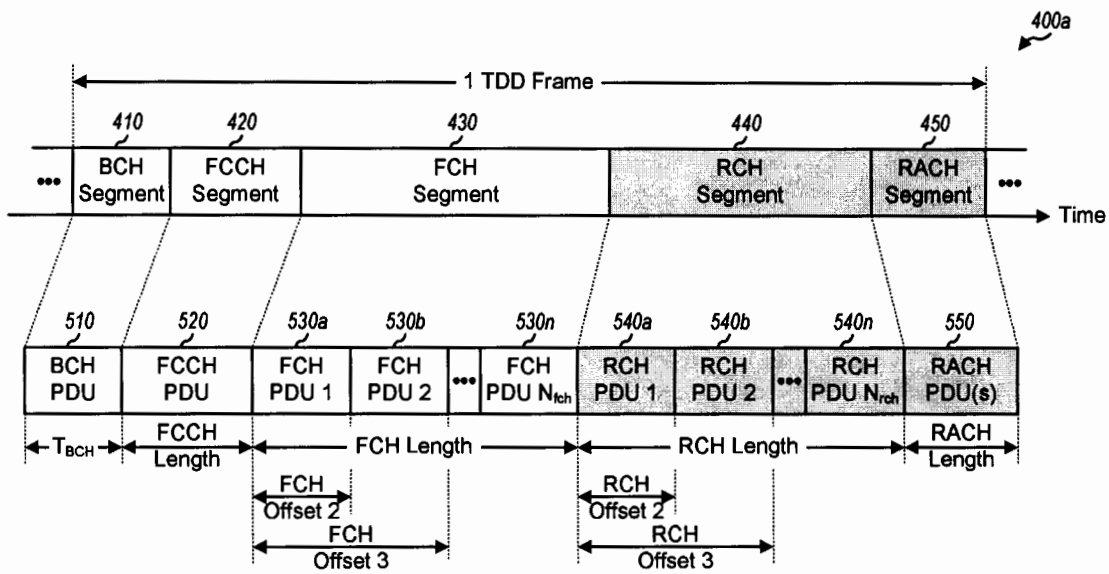

400a
1 TDD Frame
410
420
430
440
450
BCH Segment
FCCH Segment
FCH Segment
RCH Segment
RACH Segment
Time
510
520
530a
530b
530n
540a
540b
540n
550
BCH PDU
FCCH PDU
FCH PDU 1
FCH PDU 2
FCH PDU N_{fch}
RCH PDU 1
RCH PDU 2
RCH PDU N_{rch}
RACH PDU(s)
T_{BCH}
FCCH Length
FCH Length
RCH Length
RACH Length
FCH Offset 2
FCH Offset 3
RCH Offset 2
RCH Offset 3

FIG. 5

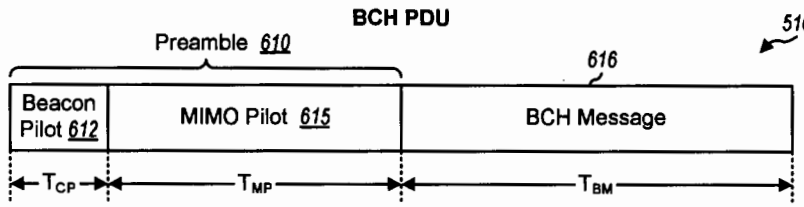

BCH PDU
510
Preamble 610
616
Beacon Pilot 612
MIMO Pilot 615
BCH Message
T_{CP}
T_{MP}
T_{BM}

FIG. 6A

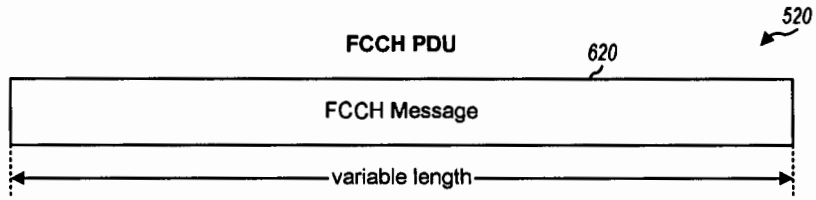

520
FCCH PDU
620
FCCH Message
variable length

FIG. 6B

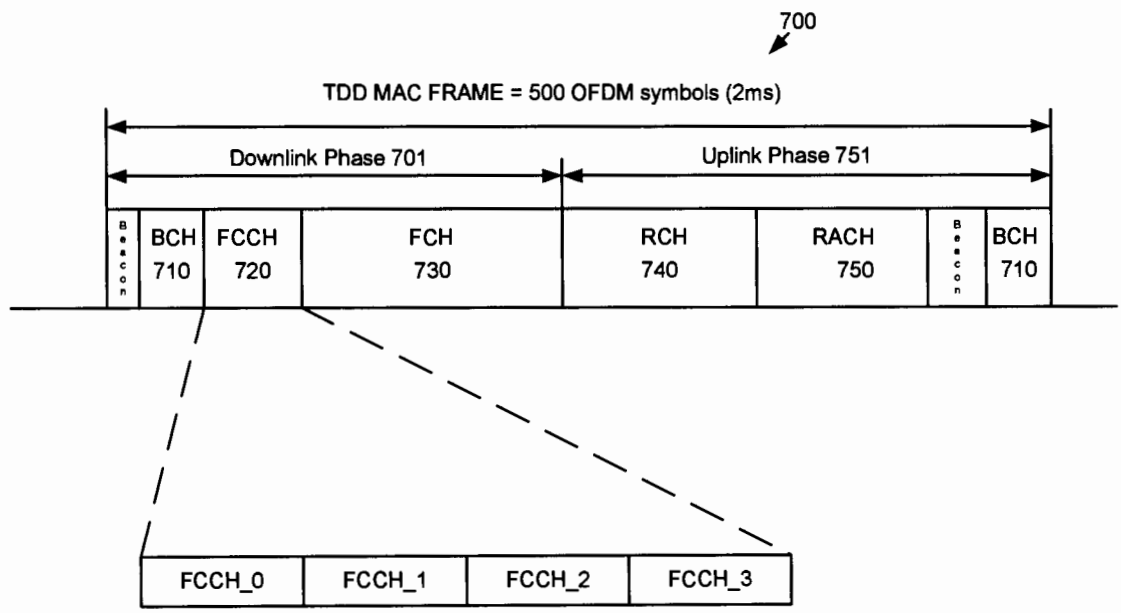

700
TDD MAC FRAME = 500 OFDM symbols (2ms)
Downlink Phase 701
Uplink Phase 751
Beacon
BCH 710
FCCH 720
FCH 730
RCH 740
RACH 750
Beacon
BCH 710
FCCH_0
FCCH_1
FCCH_2
FCCH_3

FIG. 7

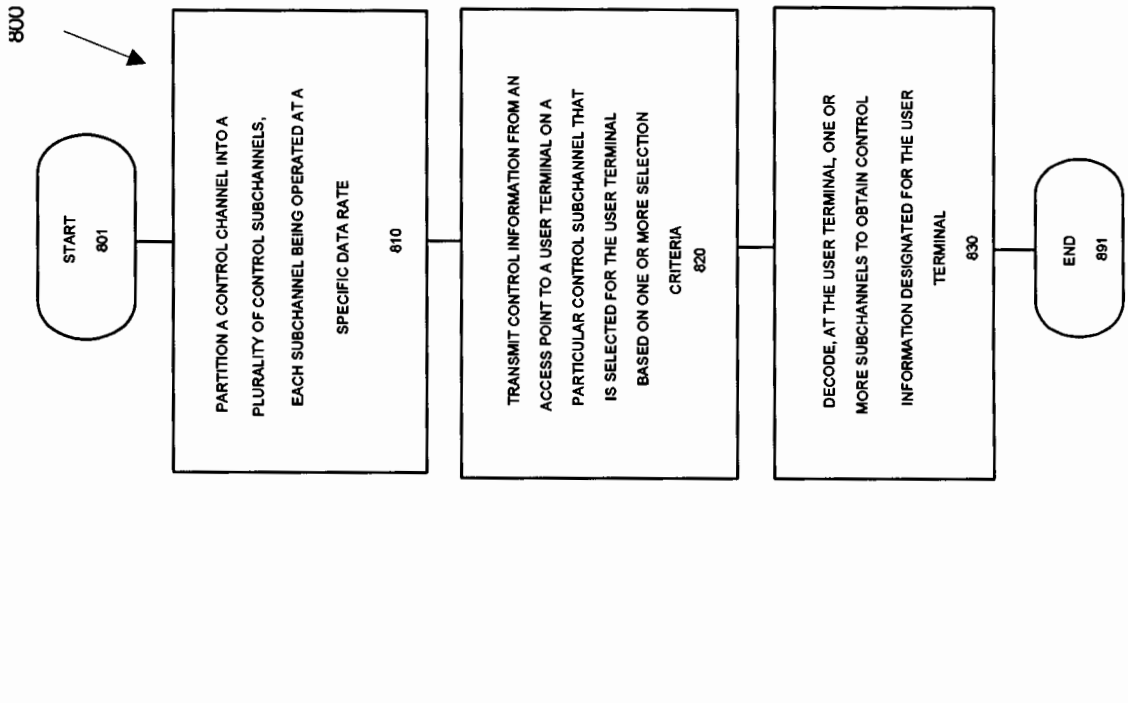

800
START
801
PARTITION A CONTROL CHANNEL INTO A PLURALITY OF CONTROL SUBCHANNELS, EACH SUBCHANNEL BEING OPERATED AT A SPECIFIC DATA RATE
810
TRANSMIT CONTROL INFORMATION FROM AN ACCESS POINT TO A USER TERMINAL ON A PARTICULAR CONTROL SUBCHANNEL THAT IS SELECTED FOR THE USER TERMINAL BASED ON ONE OR MORE SELECTION CRITERIA
820
DECODE, AT THE USER TERMINAL, ONE OR MORE SUBCHANNELS TO OBTAIN CONTROL INFORMATION DESIGNATED FOR THE USER TERMINAL
830
END
891

FIG. 8

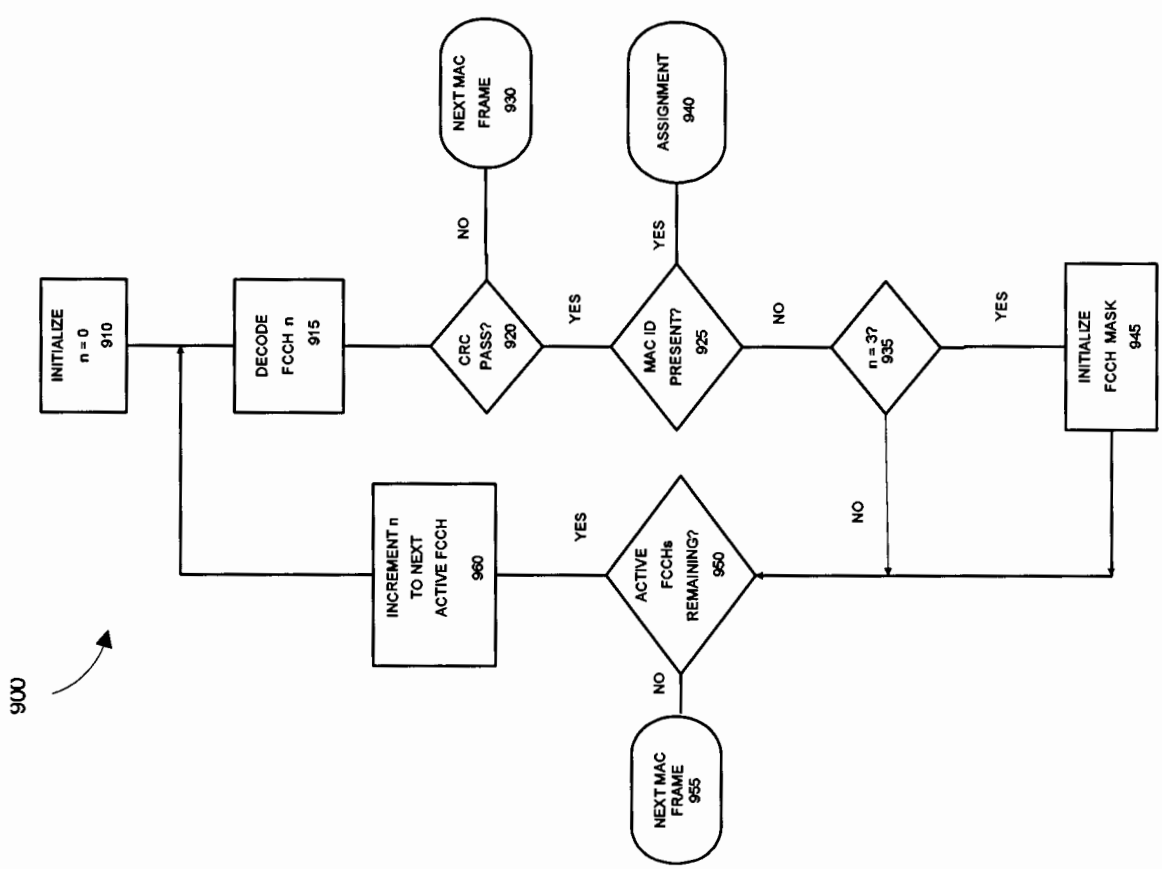

900
INITIALIZE
n = 0
910
DECODE
FCCH n
915
CRC
PASS?
920
NO
NEXT MAC
FRAME
930
YES
MAC ID
PRESENT?
925
YES
ASSIGNMENT
940
NO
n = 37
935
YES
INITIALIZE
FCCH MASK
945
NO
ACTIVE
FCCHs
REMAINING?
950
YES
INCREMENT n
TO NEXT
ACTIVE FCCH
960
NO
NEXT MAC
FRAME
955

FIG. 9