

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
3 May 2007 (03.05.2007)

PCT

(10) International Publication Number
WO 2007/051044 A2

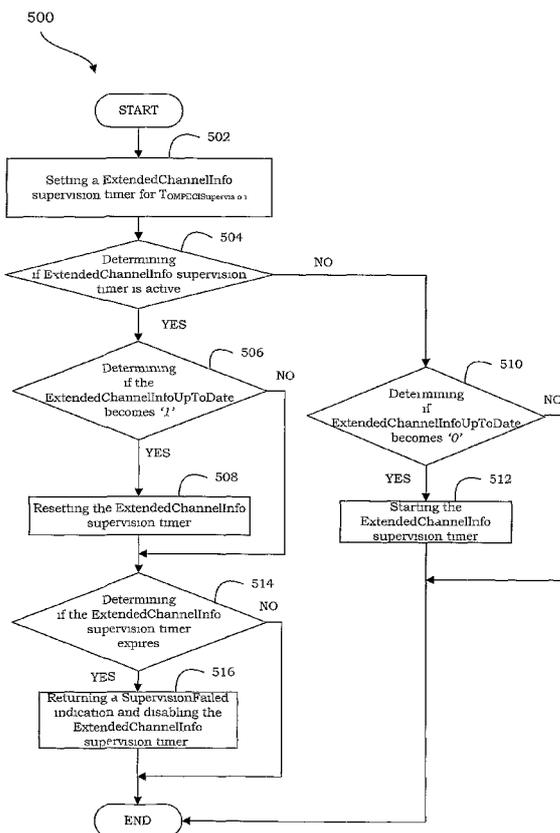
- (51) **International Patent Classification:** Not classified
- (21) **International Application Number:**
PCT/US2006/042419
- (22) **International Filing Date:** 27 October 2006 (27.10.2006)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
60/731,126 27 October 2005 (27.10.2005) US
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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW
- (84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,

[Continued on next page]

(54) **Title:** A METHOD AND APPARATUS FOR SUPERVISING QUICKCHANNELINFO BLOCK, EXTENDEDCHANNELINFO MESSAGE AND SECTORPARAMETERS MESSAGE IN WIRELESS COMMUNICATION SYSTEMS



(57) **Abstract:** A method and apparatus for supervising a QuickChannelInfo block, ExtendedChannelInfo message and SectorParameters message in a wireless communication is described. A QuickChannelInfo supervision timer for TOMPECSupervision is set. It is determined if the QuickChannelInfo supervision timer is active. An ExtendedChannelInfo supervision timer is set to TOMPECSupervision and determined if ExtendedChannelInfo supervision timer is active. A SectorParameters supervision timer is set to TOMPECSupervision and determined if the SectorParameters supervision timer is active.

WO 2007/051044 A2



ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(Ui))*

Published:

— *without international search report and to be republished upon receipt of that report*

Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(U))*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A METHOD AND APPARATUS FOR SUPERVISING
QUICKCHANNELINFO BLOCK, EXTENDEDCHANNELINFO
MESSAGE AND SECTORPARAMETERS MESSAGE IN
WIRELESS COMMUNICATION SYSTEMS

CLAIM OF PRIORITY UNDER 35 U.S.C.§119

[0001] The present Application for Patent claims priority to Provisional Application Serial No.60/731,126 entitled "METHODS AND APPARATUS FOR PROVIDING MOBILE BROADBAND WIRELESS LOWER MAC", filed 10/27/2005, assigned to the assignee hereof, and expressly incorporated herein by reference.

BACKGROUND

Field

[0002] The present disclosure relates generally to wireless communications, and more particularly to method and apparatus for supervising QuickChannelInfo block, ExtendedChannelInfo message and SectorParameters message.

Background

[0003] Wireless communication systems have become a prevalent means by which a majority of people worldwide have come to communicate. Wireless communication devices have become smaller and more powerful in order to meet consumer needs and to improve portability and convenience. The increase in processing power in mobile devices such as cellular telephones has lead to an increase in demands on wireless network transmission systems. Such systems typically are not as easily updated as the cellular devices that communicate there over. As mobile device capabilities expand, it can be difficult to maintain an older wireless network system in a manner that facilitates fully exploiting new and improved wireless device capabilities.

[0004] Wireless communication systems generally utilize different approaches to generate transmission resources in the form of channels. These systems may be code

division multiplexing (CDM) systems, frequency division multiplexing (FDM) systems, and time division multiplexing (TDM) systems. One commonly utilized variant of FDM is orthogonal frequency division multiplexing (OFDM) that effectively partitions the overall system bandwidth into multiple orthogonal subcarriers. These subcarriers may also be referred to as tones, bins, and frequency channels. Each subcarrier can be modulated with data. With time division based techniques, each subcarrier can comprise a portion of sequential time slices or time slots. Each user may be provided with a one or more time slot and subcarrier combinations for transmitting and receiving information in a defined burst period or frame. The hopping schemes may generally be a symbol rate hopping scheme or a block hopping scheme.

[0005] Code division based techniques typically transmit data over a number of frequencies available at any time in a range. In general, data is digitized and spread over available bandwidth, wherein multiple users can be overlaid on the channel and respective users can be assigned a unique sequence code. Users can transmit in the same wide-band chunk of spectrum, wherein each user's signal is spread over the entire bandwidth by its respective unique spreading code. The technique can provide for sharing, wherein one or more users can concurrently transmit and receive. Such sharing can be achieved through spread spectrum digital modulation, wherein a user's stream of bits is generated and spread across a very wide channel in a pseudo-random fashion. The receiver is designed to recognize the associated unique sequence code and undo the randomization in order to collect the bits for a particular user in a coherent manner.

[0006] A typical wireless communication network (*e.g.*, employing frequency, time, and/or code division techniques) includes one or more base stations that provide a coverage area and one or more mobile (*e.g.*, wireless) terminals that can transmit and receive data within the coverage area. A typical base station can simultaneously transmit multiple data streams for broadcast, multicast, and/or unicast services, wherein a data stream is a stream of data that can be of independent reception interest to a mobile terminal. A mobile terminal within the coverage area of that base station can be interested in receiving one, more than one or all the data streams transmitted from the base station. Likewise, a mobile terminal can transmit data to the base station or another mobile terminal. In these systems the bandwidth and other system resources are assigned utilizing a scheduler.

[0007] The signals, signal formats, signal exchanges, methods, processes, and techniques disclosed herein provide several advantages over known approaches. These include, for example, reduced signaling overhead, improved system throughput, increased signaling flexibility, reduced information processing, reduced transmission bandwidth, reduced bit processing, increased robustness, improved efficiency, and reduced transmission power.

SUMMARY

[0008] The following presents a simplified summary of one or more embodiments in order to provide a basic understanding of such embodiments. The summary is not an extensive overview of all contemplated embodiments, and is intended to neither identify key or critical elements of all embodiments nor delineate the scope of any or all embodiments. Its sole purpose is to present some concepts of one or more embodiments in a simplified form as a prelude to the more detailed description that is presented later.

[0009] According to an embodiment, a method is provided for supervising operation including QuickChannelInfo block in a wireless communication system comprising setting a QuickChannelInfo supervision timer for $T_{\text{MP}_{\text{E}}\text{Cis}_{\text{u}}\text{pervisi}_{\text{on}}}$ and determining if QuickChannelInfo supervision timer is active.

[0010] According to yet another embodiment, an apparatus operable in a wireless communication system is described which includes means for setting a QuickChannelInfo supervision timer for $T_{\text{MPE}\text{Cis}_{\text{u}}\text{pervisi}_{\text{on}}}$ and means for determining if QuickChannelInfo supervision timer is active.

[0011] According to yet another embodiment, a computer readable medium is described having a first set of instructions for setting a QuickChannelInfo supervision timer for $T_{\text{MPE}\text{Cis}_{\text{u}}\text{pervisi}_{\text{on}}}$ and a second set of instructions for determining if QuickChannelInfo supervision timer is active.

[0012] According to an embodiment, a method is provided for supervising operation including ExtendedChannelInfo message in a wireless communication system comprising setting an ExtendedChannelInfo supervision timer for $T_{\text{O}_{\text{MPE}\text{Cis}_{\text{u}}\text{pervisi}_{\text{on}}}}$ and determining if ExtendedChannelInfo supervision timer is active.

[0013] According to yet another embodiment, an apparatus operable in a wireless communication system is described which includes means for setting an ExtendedChannellInfo supervision timer for ToMPEc_isup_vision and means for determining if ExtendedChannellInfo supervision timer is active.

[0014] According to yet another embodiment, a computer readable medium is described having a first set of instructions for setting an ExtendedChannellInfo supervision timer for ToMPEc_isup_vision and a second set of instructions for determining if ExtendedChannellInfo supervision timer is active.

[0015] According to an embodiment, a method is provided for supervising SectorParameters message in a wireless communication system comprising setting a SectorParameters supervision timer for ToM_PS_Psup_vision and determining if SectorParameters supervision timer is active.

[0016] According to yet another embodiment, an apparatus operable in a wireless communication system is described which includes means for setting a SectorParameters supervision timer for ToM_PS_PSup_vision and means for determining if SectorParameters supervision timer is active.

[0017] According to yet another embodiment, a computer readable medium is described having a first set of instructions for setting a SectorParameters supervision timer for ToM_PS_Psup_vision and a second set of instructions for determining if SectorParameters supervision timer is active

[0018] To the accomplishment of the foregoing and related ends, the one or more embodiments comprise the features hereinafter fully described and particularly pointed out in the claims. The following description and the annexed drawings set forth in detail certain illustrative embodiments of the one or more embodiments. These embodiments are indicative, however, of but a few of the various ways in which the principles of various embodiments may be employed and the described embodiments are intended to include all such embodiments and their equivalents.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] Fig. 1 illustrates embodiments of a multiple access wireless communication system;

[0020] Fig. 2 illustrates embodiments of a transmitter and receiver in a multiple access wireless communication system;

[0021] Figs. 3A and 3B illustrate embodiments of *superframe* structures for a multiple access wireless communication system;

[0022] Fig. 4A illustrates a flow diagram of a process used by access terminal for supervising QuickChannellInfo block;

[0023] Fig. 4B illustrates one or more processors for supervising QuickChannellInfo block;

[0024] Fig. 5A illustrates a flow diagram of a process used by the access terminal for supervising ExtendedChannellInfo message;

[0025] Fig. 5B illustrates one or more processors for supervising ExtendedChannellInfo message;

[0026] Fig. 6A illustrates a flow diagram of a process used by access terminal for supervising SectorParameters message; and

[0027] Fig. 6B illustrates one or more processors for supervising SectorParameters message.

DETAILED DESCRIPTION

[0028] Various embodiments are now described with reference to the drawings, wherein like reference numerals are used to refer to like elements throughout. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of one or more embodiments. It may be evident; however, that such embodiment(s) may be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form in order to facilitate describing one or more embodiments.

[0029] Referring to Fig. 1, a multiple access wireless communication system according to one embodiment is illustrated. A multiple access wireless communication system 100 includes multiple cells, e.g. cells 102, 104, and 106. In the embodiment of Fig. 1, each cell 102, 104, and 106 may include an access point 150 that includes multiple sectors. The multiple sectors are formed by groups of antennas each responsible for communication with access terminals in a portion of the cell. In cell 102, antenna groups 112, 114, and 116 each correspond to a different sector. In cell 104, antenna

groups 118, 120, and 122 each correspond to a different sector. In cell 106, antenna groups 124, 126, and 128 each correspond to a different sector.

[0030] Each cell includes several access terminals which are in communication with one or more sectors of each access point. For example, access terminals 130 and 132 are in communication base 142, access terminals 134 and 136 are in communication with access point 144, and access terminals 138 and 140 are in communication with access point 146.

[0031] Controller 130 is coupled to each of the cells 102, 104, and 106. Controller 130 may contain one or more connections to multiple networks, e.g. the Internet, other packet based networks, or circuit switched voice networks that provide information to, and from, the access terminals in communication with the cells of the multiple access wireless communication system 100. The controller 130 includes, or is coupled with, a scheduler that schedules transmission from and to access terminals. In other embodiments, the scheduler may reside in each individual cell, each sector of a cell, or a combination thereof.

[0032] As used herein, an access point may be a fixed station used for communicating with the terminals and may also be referred to as, and include some or all the functionality of, a base station, a Node B, or some other terminology. An access terminal may also be referred to as, and include some or all the functionality of, a user equipment (UE), a wireless communication device, terminal, a mobile station or some other terminology.

[0033] It should be noted that while Fig. 1, depicts physical sectors, i.e. having different antenna groups for different sectors, other approaches may be utilized. For example, utilizing multiple fixed "beams" that each cover different areas of the cell in frequency space may be utilized in lieu of, or in combination with physical sectors. Such an approach is depicted and disclosed in copending US Patent Application Serial No. 11/260,895, entitled "Adaptive Sectorization In Cellular System."

[0034] Referring to Fig.2, a block diagram of an embodiment of a transmitter system 210 and a receiver system 250 in a MDvIO system 200 is illustrated. At transmitter system 210, traffic data for a number of data streams is provided from a data source 212 to transmit (TX) data processor 214. In an embodiment, each data stream is transmitted over a respective transmit antenna. TX data processor 214 formats, codes, and

interleaves the traffic data for each data stream based on a particular coding scheme selected for that data stream to provide coded data.

[0035] The coded data for each data stream may be multiplexed with pilot data using OFDM, or other orthogonalization or non-orthogonalization techniques. The pilot data is typically a known data pattern that is processed in a known manner and may be used at the receiver system to estimate the channel response. The multiplexed pilot and coded data for each data stream is then modulated (i.e., symbol mapped) based on one or more particular modulation schemes (e.g., BPSK, QSPK, M-PSK, or M-QAM) selected for that data stream to provide modulation symbols. The data rate, coding, and modulation for each data stream may be determined by instructions performed on provided by processor 230.

[0036] The modulation symbols for all data streams are then provided to a TX processor 220, which may further process the modulation symbols (e.g., for OFDM). TX processor 220 then provides N_T modulation symbol streams to N_T transmitters (TMTR) 222a through 222t. Each transmitter 222 receives and processes a respective symbol stream to provide one or more analog signals, and further conditions (e.g., amplifies, filters, and upconverts) the analog signals to provide a modulated signal suitable for transmission over the MIMO channel. N_T modulated signals from transmitters 222a through 222t are then transmitted from N_T antennas 224a through 224t, respectively.

[0037] At receiver system 250, the transmitted modulated signals are received by N_R antennas 252a through 252r and the received signal from each antenna 252 is provided to a respective receiver (RCVR) 254. Each receiver 254 conditions (e.g., filters, amplifies, and downconverts) a respective received signal, digitizes the conditioned signal to provide samples, and further processes the samples to provide a corresponding "received" symbol stream.

[0038] An RX data processor 260 then receives and processes the N_R received symbol streams from N_R receivers 254 based on a particular receiver processing technique to provide N_T "detected" symbol streams. The processing by RX data processor 260 is described in further detail below. Each detected symbol stream includes symbols that are estimates of the modulation symbols transmitted for the corresponding data stream. RX data processor 260 then demodulates, deinterleaves, and processes each detected symbol stream to recover the traffic data for the data stream. The processing by RX data

processor 218 is complementary to that performed by TX processor 220 and TX data processor 214 at transmitter system 210.

[0039] RX data processor 260 may be limited in the number of subcarriers that it may simultaneously demodulate, e.g. 512 subcarriers or 5 MHz, and such a receiver should be scheduled on a single carrier. The limitation may be a function of its FFT range, e.g. sample rates at which the processor 260 may operate, the memory available for FFT, or other functions available for demodulation. Further, the greater the number of subcarriers utilized, the greater the expense of the access terminal.

[0040] The channel response estimate generated by RX processor 260 may be used to perform space, space/time processing at the receiver, adjust power levels, change modulation rates or schemes, or other actions. RX processor 260 may further estimate the signal-to-noise-and-interference ratios (SNRs) of the detected symbol streams, and possibly other channel characteristics, and provides these quantities to a processor 270. RX data processor 260 or processor 270 may further derive an estimate of the "operating" SNR for the system. Processor 270 then provides channel state information (CSI), which may comprise various types of information regarding the communication link and/or the received data stream. For example, the CSI may comprise only the operating SNR. In other embodiments, the CSI may comprise a channel quality indicator (CQI), which may be a numerical value indicative of one or more channel conditions. The CSI is then processed by a TX data processor 278, modulated by a modulator 280, conditioned by transmitters 254a through 254r, and transmitted back to transmitter system 210.

[0041] At transmitter system 210, the modulated signals from receiver system 250 are received by antennas 224, conditioned by receivers 222, demodulated by a demodulator 240, and processed by a RX data processor 242 to recover the CSI reported by the receiver system. The reported CSI is then provided to processor 230 and used to (1) determine the data rates and coding and modulation schemes to be used for the data streams and (2) generate various controls for TX data processor 214 and TX processor 220. Alternatively, the CSI may be utilized by processor 270 to determine modulation schemes and/or coding rates for transmission, along with other information. The may then be provided to the transmitter which uses the information, which may be quantized, to provide later transmissions to the receiver.

[0042] Processors 230 and 270 direct the operation at the transmitter and receiver systems, respectively. Memories 232 and 272 provide storage for program codes and data used by processors 230 and 270, respectively.

[0043] At the receiver, various processing techniques may be used to process the y_R received signals to detect the N_T transmitted symbol streams. These receiver processing techniques may be grouped into two primary categories (i) spatial and space-time receiver processing techniques (which are also referred to as equalization techniques); and (ii) "successive nulling/equalization and interference cancellation" receiver processing technique (which is also referred to as "successive interference cancellation" or "successive cancellation" receiver processing technique).

[0044] While Fig. 2 discusses a MBVIO system, the same system may be applied to a multi-input single-output system where multiple transmit antennas, e.g. those on a base station, transmit one or more symbol streams to a single antenna device, e.g. a mobile station. Also, a single output to single input antenna system may be utilized in the same manner as described with respect to Fig. 2.

[0045] The transmission techniques described herein may be implemented by various means. For example, these techniques may be implemented in hardware, firmware, software, or a combination thereof. For a hardware implementation, the processing units at a transmitter may be implemented within one or more application specific integrated circuits (ASICs), digital signal processors (DSPs), digital signal processing devices (DSPDs), programmable logic devices (PLDs), field programmable gate arrays (FPGAs), processors, controllers, micro-controllers, microprocessors, processors, other electronic units designed to perform the functions described herein, or a combination thereof. The processing units at a receiver may also be implemented within one or more ASICs, DSPs, processors, and so on.

[0046] For a software implementation, the transmission techniques may be implemented with processors (e.g., procedures, functions, and so on) that perform the functions described herein. The software codes may be stored in a memory (e.g., memory 230, 272x or 272y in Fig. 2) and executed by a processor (e.g., processor 232, 270x or 270y). The memory may be implemented within the processor or external to the processor.

[0047] It should be noted that the concept of channels herein refers to information or transmission types that may be transmitted by the access point or access terminal. It does not require or utilize fixed or predetermined blocks of subcarriers, time periods, or other resources dedicated to such transmissions.

[0048] Referring to Figs. 3A and 3B, embodiments of *superframe* structures for a multiple access wireless communication system are illustrated. Fig. 3A illustrates embodiments of *superframe* structures for a frequency division duplexed (FDD) multiple access wireless communication system, while Fig. 3B illustrates embodiments of *superframe* structures for a time division duplexed (TDD) multiple access wireless communication system. The superframe preamble may be transmitted separately for each carrier or may span all of the carriers of the sector.

[0049] In both Figs. 3A and 3B, the forward link transmission is divided into units of superframes. A superframe may consist of a superframe preamble followed by a series of frames. In an FDD system, the reverse link and the forward link transmission may occupy different frequency bandwidths so that transmissions on the links do not, or for the most part do not, overlap on any frequency subcarriers. In a TDD system, N forward link frames and M reverse link frames define the number of sequential forward link and reverse link frames that may be continuously transmitted prior to allowing transmission of the opposite type of frame. It should be noted that the number of N and M may vary within a given superframe or between superframes.

[0050] In both FDD and TDD systems each superframe may comprise a superframe preamble. In certain embodiments, the superframe preamble includes a pilot channel that includes pilots that may be used for channel estimation by access terminals, a broadcast channel that includes configuration information that the access terminal may utilize to demodulate the information contained in the forward link frame. Further acquisition information such as timing and other information sufficient for an access terminal to communicate on one of the carriers and basic power control or offset information may also be included in the superframe preamble. In other cases, only some of the above and/or other information may be included in the superframe preamble.

[0051] As shown in Figs. 3A and 3B, the superframe preamble is followed by a sequence of frames. Each frame may consist of a same or a different number of OFDM symbols, which may constitute a number of subcarriers that may simultaneously utilized

for transmission over some defined period. Further, each frame may operate according to a symbol rate hopping mode, where one or more non-contiguous OFDM symbols are assigned to a user on a forward link or reverse link, or a block hopping mode, where users hop within a block of OFDM symbols. The actual blocks or OFDM symbols may or may not hop between frames.

[0052] The access terminal processes the QuickChannellInfo block, ExtendedChannellInfo message and SectorParameters message according to an embodiment. Using a communication link and based upon predetermined timing, system conditions, or other decision criteria, the access terminal will process the QuickChannellInfo block, ExtendedChannellInfo message and SectorParameters message. The communication link may be implemented using communication protocols/standards such as World Interoperability for Microwave Access (WiMAX), infrared protocols such as Infrared Data Association (IrDA), short-range wireless protocols/technologies, Bluetooth® technology, ZigBee® protocol, ultra wide band (UWB) protocol, home radio frequency (HomeRF), shared wireless access protocol (SWAP), wideband technology such as a wireless Ethernet compatibility alliance (WECA), wireless fidelity alliance (Wi-Fi Alliance), 802.11 network technology, public switched telephone network technology, public heterogeneous communications network technology such as the Internet, private wireless communications network, land mobile radio network, code division multiple access (CDMA), wideband code division multiple access (WCDMA), universal mobile telecommunications system (UMTS), advanced mobile phone service (AMPS), time division multiple access (TDMA), frequency division multiple access (FDMA), orthogonal frequency division multiple (OFDM), orthogonal frequency division multiple access (OFDMA), orthogonal frequency division multiple FLASH (OFDM-FLASH), global system for mobile communications (GSM), single carrier (IX) radio transmission technology (RTT), evolution data only (EV-DO) technology, general packet radio service (GPRS), enhanced data GSM environment (EDGE), high speed downlink data packet access (HSPDA), analog and digital satellite systems, and any other technologies/protocols that may be used in at least one of a wireless communications network and a data communications network

[0053] The access terminal is configured to process the QuickChannellInfo block comprising setting a QuickChannellInfo supervision timer for $ToMPECiSupervi_{opt}$ and determining if QuickChannellInfo supervision timer is active. In one embodiment, the

access terminal determines if the QuickChannelInfoUpToDate becomes '1' and resets the QuickChannelInfo supervision timer. In another embodiment, the access terminal determines if the QuickChannelInfoUpToDate becomes '0' and starts the QuickChannelInfo supervision timer. In one embodiment, the access terminal determines if the QuickChannelInfo supervision timer has expired and returns a SupervisionFailed indication and disables the QuickChannelInfo supervision timer.

[0054] The access terminal is configured to process the ExtendedChannelInfo message comprising setting a ExtendedChannelInfo supervision timer for $T_{\text{MPE C isupervision}}$ and determining if ExtendedChannelInfo supervision timer is active. In one embodiment, the access terminal determines if the ExtendedChannelInfoUpToDate becomes '1' and resets the ExtendedChannelInfo supervision timer. In another embodiment, the access terminal determines if the ExtendedChannelInfoUpToDate becomes '0' and starts the ExtendedChannelInfo supervision timer. In one embodiment, the access terminal determines if the ExtendedChannelMb supervision timer has expired and returns a SupervisionFailed indication and disables the ExtendedChannelInfo supervision timer.

[0055] The access terminal is configured to process the SectorParameters message comprising setting a SectorParameters supervision timer for $T_{\text{MP SP Supervision}}$ and determining if SectorParameters supervision timer is active. In one embodiment, the access terminal determines if the SectorParametersUpToDate becomes '1' and resets the SectorParameters supervision timer. In another embodiment, the access terminal determines if the SectorParametersUpToDate becomes '0' and starts the SectorParameters supervision timer. In one embodiment, the access terminal determines if the SectorParameters supervision timer has expired and returns a SupervisionFailed indication and disables the SectorParameters supervision timer.

[0056] FIG. 4A illustrates a flow diagram of process 400, according to an embodiment. At 402, the access terminal sets a QuickChannelInfo supervision timer for $T_{\text{MPE C isupervision}}$. At 404, the access terminal determines if QuickChannelInfo supervision timer is active. In one embodiment, at 406, the access terminal determines if the QuickChannelInfoUpToDate becomes '1' and at 408, the access terminal resets the QuickChannelInfo supervision timer. In another embodiment, at 410, the access terminal determines if the QuickChannelInfoUpToDate becomes '0' and at 412, the access terminal starts the QuickChannelInfo supervision timer. In one embodiment, at 414, the access terminal determines if the QuickChannelInfo supervision timer has expired. At

416, the access terminal returns a SupervisionFailed indication and disables the QuickChannellInfo supervision timer. Determining if the QuickChannellInfo supervision timer is active increases the access terminal efficiency such that one or more of the aforementioned embodiments need not occur.

[0057] Fig 4B illustrates a processor 450 for supervising the QuickChannellInfo block. The processor referred to may be electronic devices and may comprise one or more processors configured for supervising the QuickChannellInfo block. Processor 452 sets a QuickChannellInfo supervision timer for ToMPEci_{Supervision}. Processor 454 determines if QuickChannellInfo supervision timer is active. In one embodiment, processor 456, determines if the QuickChannellInfoUpToDate becomes '1' and processor 458 resets the QuickChannellInfo supervision timer. In another embodiment, processor 460 determines if the QuickChannellInfoUpToDate becomes '0' and processor 462 starts the QuickChannellInfo supervision timer, in one embodiment, Processor 464 determines if the QuickChannellInfo supervision timer has expired. Processor 466 returns a SupervisionFailed indication and disables the QuickChannellInfo supervision timer. The functionality of the discrete processors 452 to 466 depicted in the figure may be combined into a single processor 468. A memory 470 is also coupled to the processor 468. Determining if the QuickChannellInfo supervision timer is active increases the processing efficiency such that one or more of the aforementioned embodiments need not occur.

[0058] In another embodiment, an apparatus is described which includes means for supervising the QuickChannellInfo block comprising setting a QuickChannellInfo supervision timer for ToMPEciSupervision and determining if QuickChannellInfo supervision timer is active. In one embodiment, the apparatus comprises means for determining if the QuickChannellInfoUpToDate becomes '1' and means for resetting the QuickChannellInfo supervision timer. In another embodiment, the apparatus comprises means for determining if the QuickChannellInfoUpToDate becomes '0' and means for starting the QuickChannellInfo supervision timer. In one embodiment, the apparatus comprises means for determining if the QuickChannellInfo supervision timer has expired. The apparatus also comprises means for returning a SupervisionFailed indication and means for disabling the QuickChannellInfo supervision timer. The means described herein may be one or more processors.

[0059] FIG. 5A illustrates a flow diagram of process 500, according to an embodiment. At 502, the access terminal sets an ExtendedChannellInfo supervision timer for ToMPECisupervision. At 504, the access terminal determines if ExtendedChannellInfo supervision timer is active. In one embodiment, at 506, the access terminal determines if the ExtendedChannellInfoUpToDate becomes '1' and at 508, the access terminal resets the ExtendedChannellInfo supervision timer. In another embodiment, at 510, the access terminal determines if the ExtendedChannellInfoUpToDate becomes '0' and at 512, the access terminal starts the ExtendedChannellInfo supervision timer. In one embodiment, at 514, the access terminal determines if the ExtendedChannellInfo supervision timer has expired. At 516, the access terminal returns a SupervisionFailed indication and disables the ExtendedChannellInfo supervision timer. Determining if the ExtendedChannellInfo supervision timer is active increases the access terminal efficiency such that one or more of the aforementioned embodiments need not occur.

[0060] Fig 5B illustrates a processor 550 for supervising the ExtendedChannellInfo message. The processor referred to may be electronic devices and may comprise one or more processors configured for supervising the ExtendedChannellInfo message. Processor 502 sets an ExtendedChannellInfo supervision timer for ToMPECisupervision. Processor 554, the access terminal determines if ExtendedChannellInfo supervision timer is active. In one embodiment, processor 556 determines if the ExtendedChannellInfoUpToDate becomes '1' and processor 558 resets the ExtendedChannellInfo supervision timer. In another embodiment, processor 560 determines if the ExtendedChannellInfoUpToDate becomes '0' and processor 562 starts the ExtendedChannellInfo supervision timer. In one embodiment, processor 564 determines if the ExtendedChannellInfo supervision timer has expired. Processor 566 returns a SupervisionFailed indication and disables the ExtendedChannellInfo supervision timer. The functionality of the discrete processors 552 to 566 depicted in the figure may be combined into a single processor 568. A memory 570 is also coupled to the processor 568. Determining if the ExtendedChannellInfo supervision timer is active increases the processing efficiency such that one or more of the aforementioned embodiments need not occur.

[0061] In another embodiment, an apparatus is described which includes means for supervising the ExtendedChannellInfo message comprising setting an ExtendedChannellInfo supervision timer for ToMPECisupervision and determining if

ExtendedChannellInfo supervision timer is active. In one embodiment, the apparatus comprises means for determining if the ExtendedChannellInfoUpToDate becomes '1' and means for resetting the ExtendedChannellInfo supervision timer. In another embodiment, the apparatus comprises means for determining if the ExtendedChannellInfoUpToDate becomes '0' and means for starting the ExtendedChannellInfo supervision timer. In one embodiment, the apparatus comprises means for determining if the ExtendedChannellInfo supervision timer has expired. The apparatus also comprises means for returning a SupervisionFailed indication and means for disabling the ExtendedChannellInfo supervision timer. The means described herein may be one or more processors.

[0062] FIG. 6A illustrates a flow diagram of process 600, according to an embodiment. At 602, the access terminal sets a SectorParameters supervision timer for ToMPSPSupervision. At 604, the access terminal determines if SectorParameters supervision timer is active. In one embodiment, at 606, the access terminal determines if the SectorParametersUpToDate becomes '1'. At 608, the access terminal resets the SectorParameters supervision timer. In another embodiment, at 610, the access terminal determines if the SectorParametersUpToDate becomes '0'. At 612, the access terminal starts the SectorParameters supervision timer, in one embodiment, at 614, the access terminal determines if the SectorParameters supervision timer has expired. At 616, the access terminal returns a SupervisionFailed indication and disables the SectorParameters supervision timer. Determining if the SectorParameters supervision timer is active increases the access terminal efficiency such that one or more of the aforementioned embodiments need not occur.

[0063] Fig 6B illustrates a processor 650 for supervising the SectorParameters message. The processor referred to may be electronic devices and may comprise one or more processors configured for supervising the SectorParameters message. Processor 652 sets a SectorParameters supervision timer for ToMPSPSupervision. Processor 654 determines if SectorParameters supervision timer is active. In one embodiment, processor 656 determines if the SectorParametersUpToDate becomes '1'. Processor 658 resets the SectorParameters supervision timer. In another embodiment, processor 660 determines if the SectorParametersUpToDate becomes '0' and processor 662 starts the SectorParameters supervision timer. In one embodiment, processor 664 determines if the SectorParameters supervision timer has expired. Processor 666 returns a

SupervisionFailed indication and disables the SectorParameters supervision timer. The functionality of the discrete processors 652 to 666 depicted in the figure may be combined into a single processor 668. A memory 670 is also coupled to the processor 668. Determining if the SectorParameters supervision timer is active increases the processing efficiency such that one or more of the aforementioned embodiments need not occur.

[0064] In another embodiment, an apparatus is described which includes means for supervising the SectorParameters message comprising setting a SectorParameters supervision timer for $T_{OPSPSupervision}$ and determining if SectorParameters supervision timer is active. In one embodiment, the apparatus comprises means for determining if the SectorParametersUpToDate becomes T and means for resetting the SectorParameters supervision timer. In another embodiment, the apparatus comprises means for determining if the SectorParametersUpToDate becomes '0' and means for starting the SectorParameters supervision timer. In one embodiment, the apparatus comprises means for determining if the SectorParameters supervision timer has expired. The apparatus also comprises means for returning a SupervisionFailed indication and means for disabling the SectorParameters supervision timer. The means described herein may be one or more processors.

[0065] Furthermore, embodiments may be implemented by hardware, software, firmware, middleware, microcode, or any combination thereof. When implemented in software, firmware, middleware or microcode, the program code or code segments to perform the necessary tasks may be stored in a machine readable medium such as a separate storage(s) not shown. A processor may perform the necessary tasks. A code segment may represent a procedure, a function, a subprogram, a program, a routine, a subroutine, a module, a software package, a class, or any combination of instructions, data structures, or program statements. A code segment may be coupled to another code segment or a hardware circuit by passing and/or receiving information, data, arguments, parameters, or memory contents. Information, arguments, parameters, data, etc. may be passed, forwarded, or transmitted via any suitable means including memory sharing, message passing, token passing, network transmission, etc.

[0066] Various modifications to these embodiments will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other embodiments. Thus, the description is not intended to be limited to the embodiments

shown herein but is to be accorded the widest scope consistent with the principles and novel features disclosed herein.

CLAIMS

We claim:

1. A method of supervising operation including a QuickChannellInfo block in a wireless communication system, characterized in that:

setting a QuickChannellInfo supervision timer to $ToMPECisupervi_{ion}$; and

determining if the QuickChannellInfo supervision timer is active.

2. The method as claimed in claim 1, characterized in that determining if the QuickChannellInfoUpToDate becomes $7'$.

3. The method as claimed in claim 2, characterized in that resetting the QuickChannellInfo supervision timer, if the QuickChannellInfoUpToDate becomes $7'$.

4. The method as claimed in claim 1, characterized in that determining if the QuickChannellInfoUpToDate becomes $0'$.

5. The method as claimed in claim 4, characterized in that starting the QuickChannellInfo supervision timer, if the QuickChannellInfoUpToDate becomes $0'$.

6. The method as claimed in claim 1, characterized in that returning a SupervisionFailed indication and disabling the QuickChannellInfo supervision timer, if the QuickChannellInfo supervision timer has expired.

7. A computer readable medium including instructions stored thereon, characterized in

that:

first instructions for setting a QuickChannellInfo supervision timer for

$ToMPECISupervision$; and

second instructions for determining if the QuickChannellInfo supervision timer is active.

8. An apparatus operable in a wireless communication system, characterized in that:

means for setting a QuickChannellInfo supervision timer to $T_{OMPEcisupervision}$;

and

means for determining if the QuickChannellInfo supervision timer is active.

9. The apparatus as claimed in claim 8, characterized in that means for determining if

the QuickChannellInfoUpToDate becomes '1'.

10. The apparatus as claimed in claim 9, characterized in that means for resetting the QuickChannellInfo supervision timer, if the QuickChannellInfoUpToDate becomes '1'.

11. The apparatus as claimed in claim 8, characterized in that means for determining if

the QuickChannellInfoUpToDate becomes '0'.

12. The apparatus as claimed in claim 11, characterized in that means for starting the QuickChannellInfo supervision timer, if the QuickChannellInfoUpToDate becomes '0'.

13. The apparatus as claimed in claim 14, characterized in that means for returning a SupervisionFailed indication and disabling the QuickChannellInfo supervision timer, if the QuickChannellInfo supervision timer has expired.

14. A method of supervising operation including an ExtendedChannellInfo message in

a wireless communication system, characterized in that:

setting an ExtendedChannellInfo supervision timer to $T_{OMPEcis_{upervision}}$; and

determining if ExtendedChannellInfo supervision timer is active.

15. The method as claimed in claim 14, characterized in that determining if the ExtendedChannellInfoUpToDate becomes '1'.

16. The method as claimed in claim 15, characterized in that resetting the ExtendedChannellInfo supervision timer, if the ExtendedChannellInfoUpToDate becomes '1'.

17. The method as claimed in claim 14, characterized in that determining if the ExtendedChannellInfoUpToDate becomes '0'

18. The method as claimed in claim 17, characterized in that starting the ExtendedChannellInfo supervision timer, if the ExtendedChannellInfoUpToDate becomes '0'.

19. The method as claimed in claim 21, characterized in that returning a SupervisionFailed indication and disabling the ExtendedChannellInfo supervision timer, if the ExtendedChannellInfo supervision timer expires.

20. A computer readable medium including instructions stored thereon, characterized in

that:

first instructions for setting an ExtendedChannellInfo supervision timer to

ToMPECISupervision', and

second instructions for determining if ExtendedChannellInfosupervision timer is active.

21. An apparatus operable in a wireless communication system, characterized in that:

means for setting an ExtendedChannellInfo supervision timer to

ToMPECISupervisioni and

means for detemining if ExtendedChannellInfo supervision timer is active.

22. The apparatus as claimed in claim 21, characterized in that means for determining

if the ExtendedChannellInfoUpToDate becomes '7'.

23. The apparatus as claimed in claim 22, characterized in that means for resetting the ExtendedChannellhfo supervision timer, if the ExtendedChannellInfoUpToDate becomes '1'.

24. The apparatus as claimed in claim 21, characterized in that means for determining if the ExtendedChannellInfoUpToDate becomes '0'.

25. The apparatus as claimed in claim 24, characterized in that means for starting the ExtendedChannellhfo supervision timer, if the ExtendedChannellInfoUpToDate becomes '0'.

26. The apparatus as claimed in claim 21, characterized in that means for returning a SupervisionFailed indication and disabling the ExtendedChannellInfo supervision timer, if the ExtendedChannellInfo supervision timer expires..

27. A method of supervising a SectorParameters message in a wireless communication system, characterized in that:
setting a SectorParameters supervision timer to ToMPSPSupervision; and
determining if the SectorParameters supervision timer is active.

28. The method as claimed in claim 27, characterized in that determining if the SectorParametersUpToDate becomes '1'.

29. The method as claimed in claim 28, characterized in that resetting the SectorParameters supervision timer, if the SectorParametersUpToDate becomes '1'.

30. The method as claimed in claim 27, characterized in that determining if the SectorParametersUpToDate becomes '0'.

31. The method as claimed in claim 30, characterized in that starting the

SectorParameters supervision timer, if the SectorParametersUpToDate becomes '0'.

32. The method as claimed in claim 27, characterized in that returning a SupervisionFailed indication and disabling the SectorParameters supervision timer, if the SectorParameters supervision timer expires.

33. A computer readable medium including instructions stored thereon, characterized in

that:

a first set of instructions for setting a SectorParameters supervision timer for

ToMPSPSupervision; **and**

a second set of instructions for determining if SectorParameters supervision timer is active.

34. An apparatus operable in a wireless communication system, characterized in that:

means for setting a SectorParameters supervision timer to

ToMPSPSupervision; **and**

means for determining if SectorParameters supervioin timer is active.

35. The apparatus as claimed in claim 34, characterized in that means for determining

if the SectorParametersUpToDate becomes '1'.

36. The apparatus as claimed in claim 35, characterized in that means for resetting the

SectorParameters supervision timer, if the SectorParametersUpToDate becomes '1'.

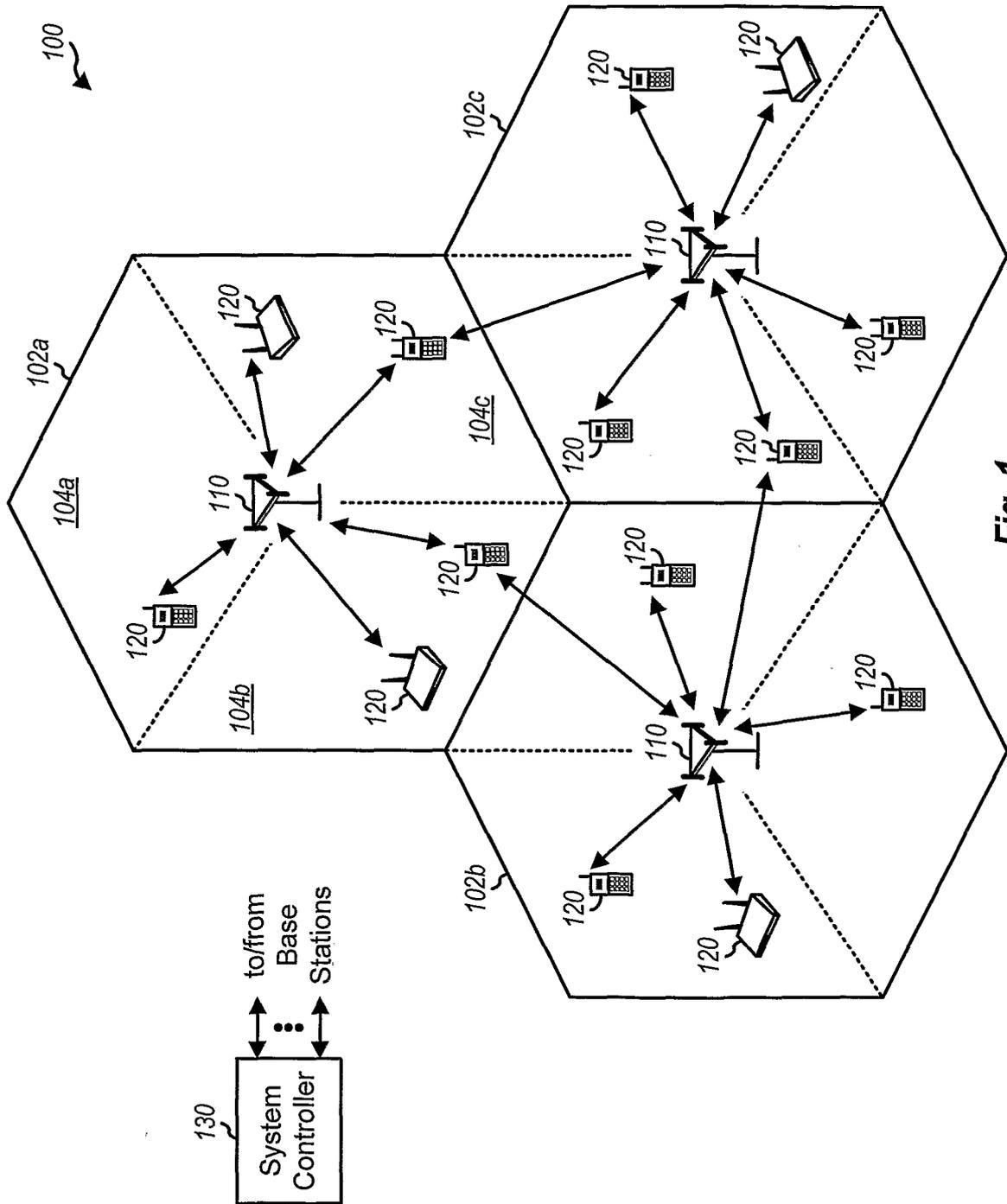
37. The apparatus as claimed in claim 34, characterized in that means for determining if

the SectorParametersUpToDate becomes '0'.

38. The apparatus as claimed in claim 37, characterized in that means for starting the

SectorParameters supervision timer, if the SectorParametersUpToDate becomes 7'.

39. The apparatus as claimed in claim 34, characterized in that means for returning a SupervisionFailed indication and disabling the SectorParameters supervision timer, if the SectorParameters supervision timer expires.



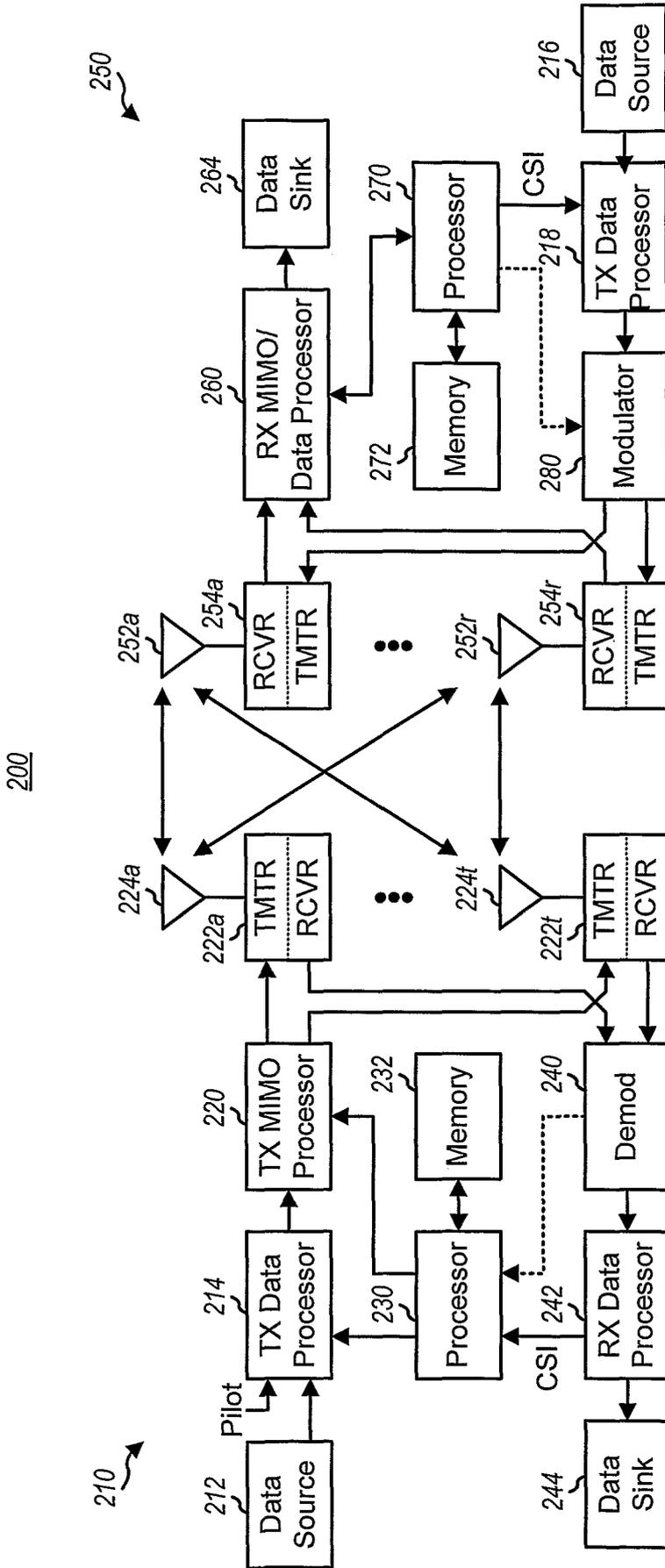


Fig 2

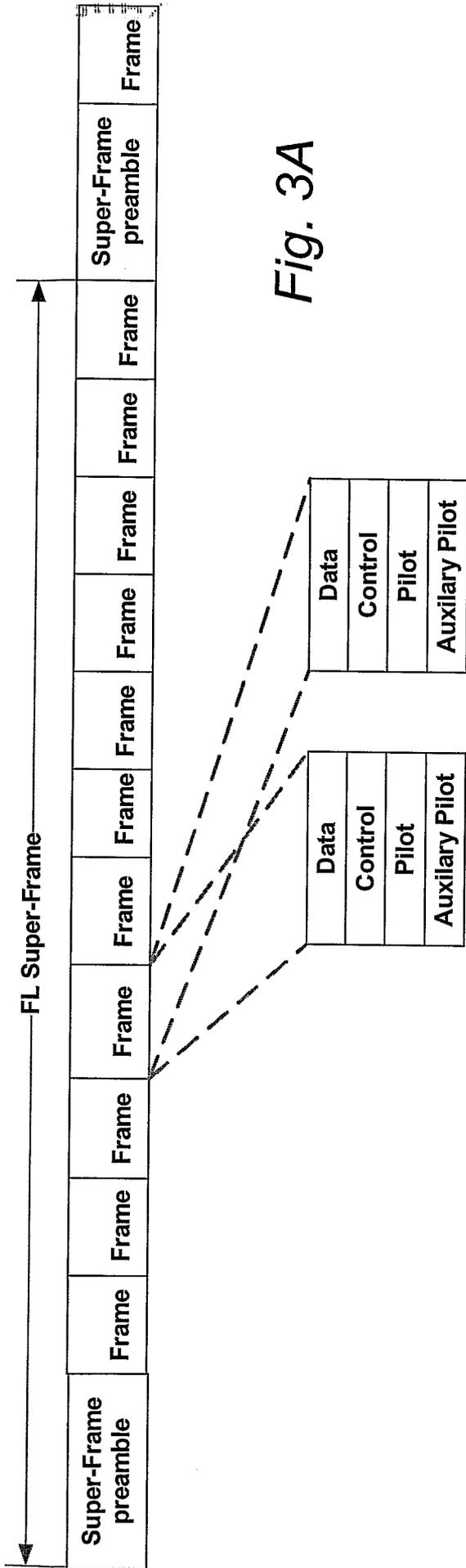


Fig. 3A

Block Hopping mode Symbol Rate Hopping mode

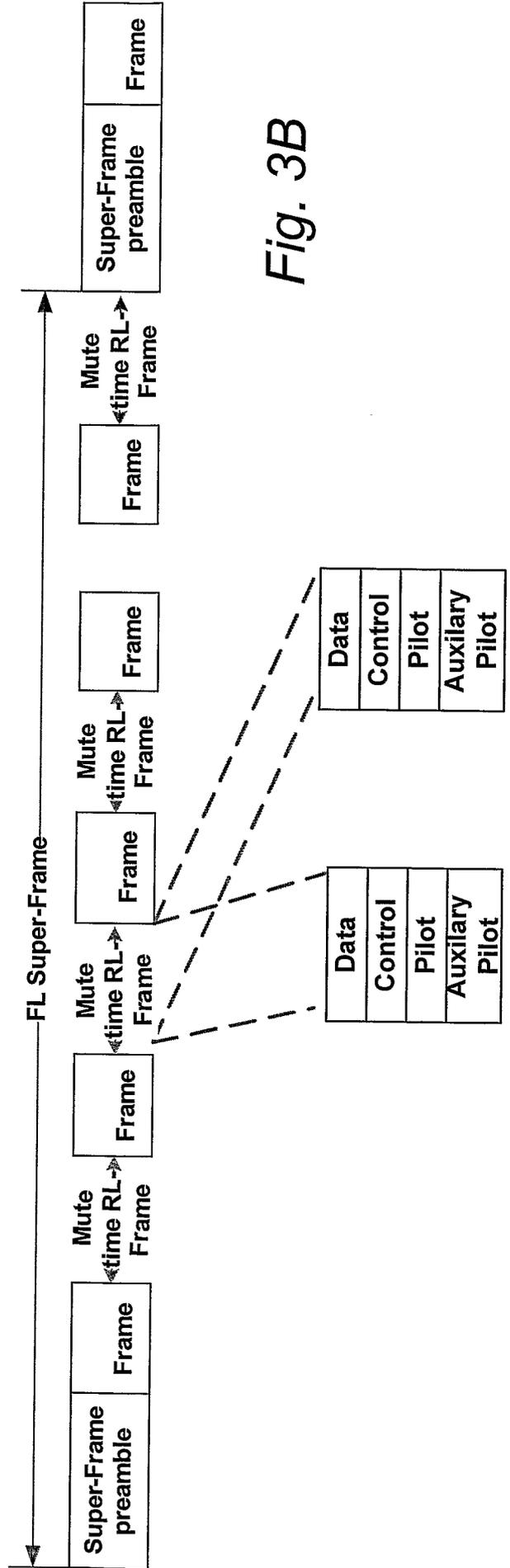


Fig. 3B

Block Hopping mode Symbol Rate Hopping mode

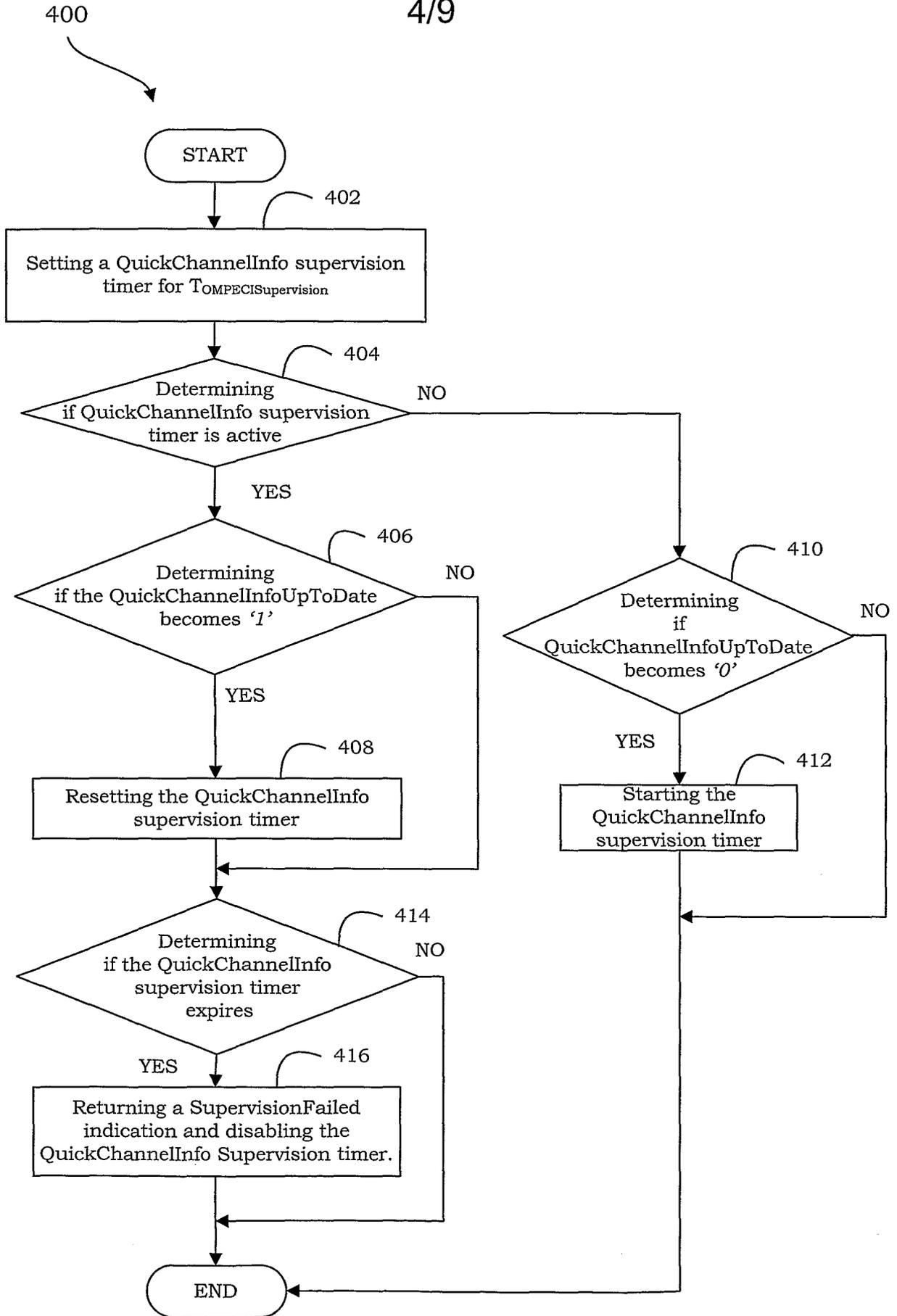


Fig. 4A

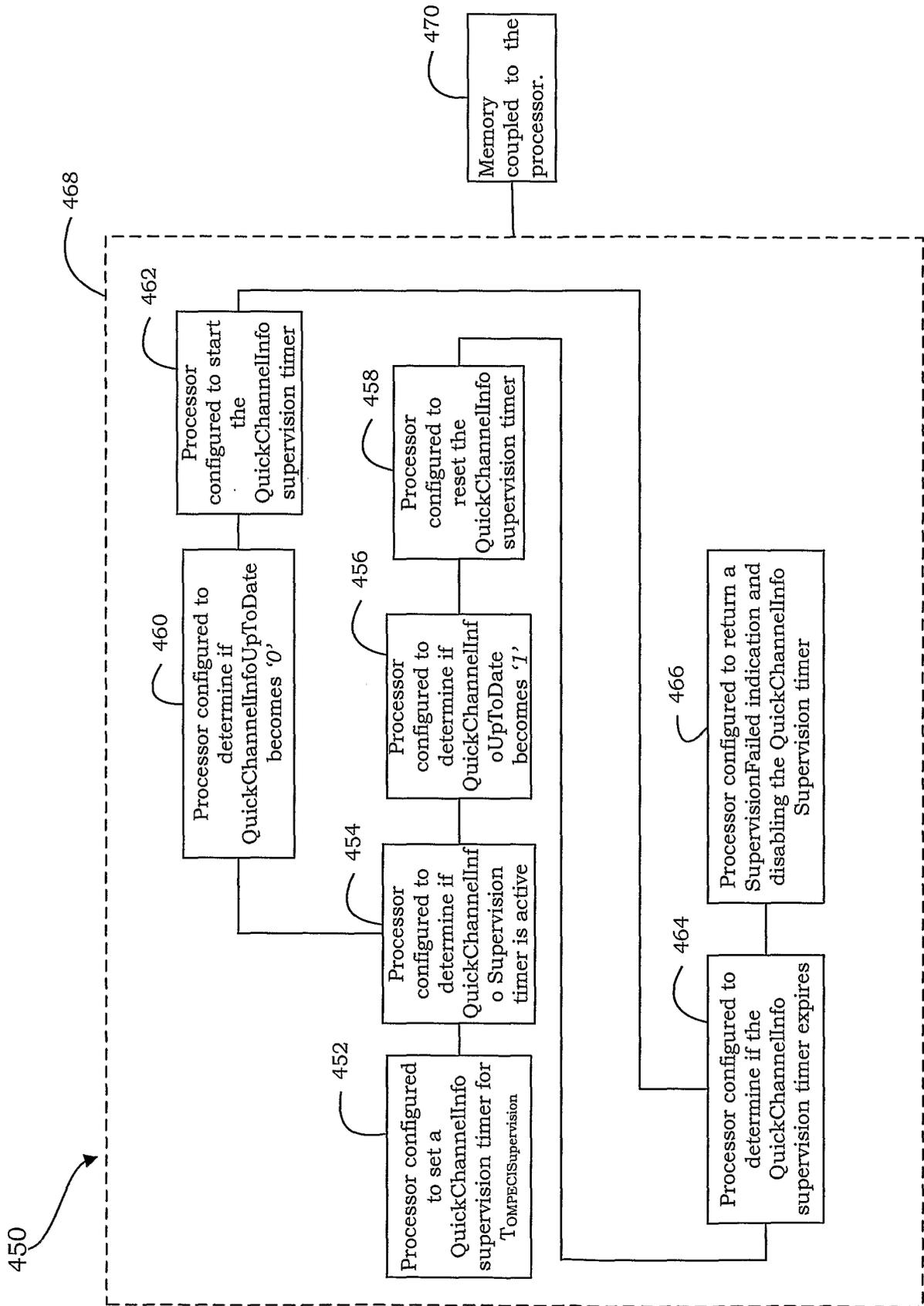


Fig. 4B

500 6/9

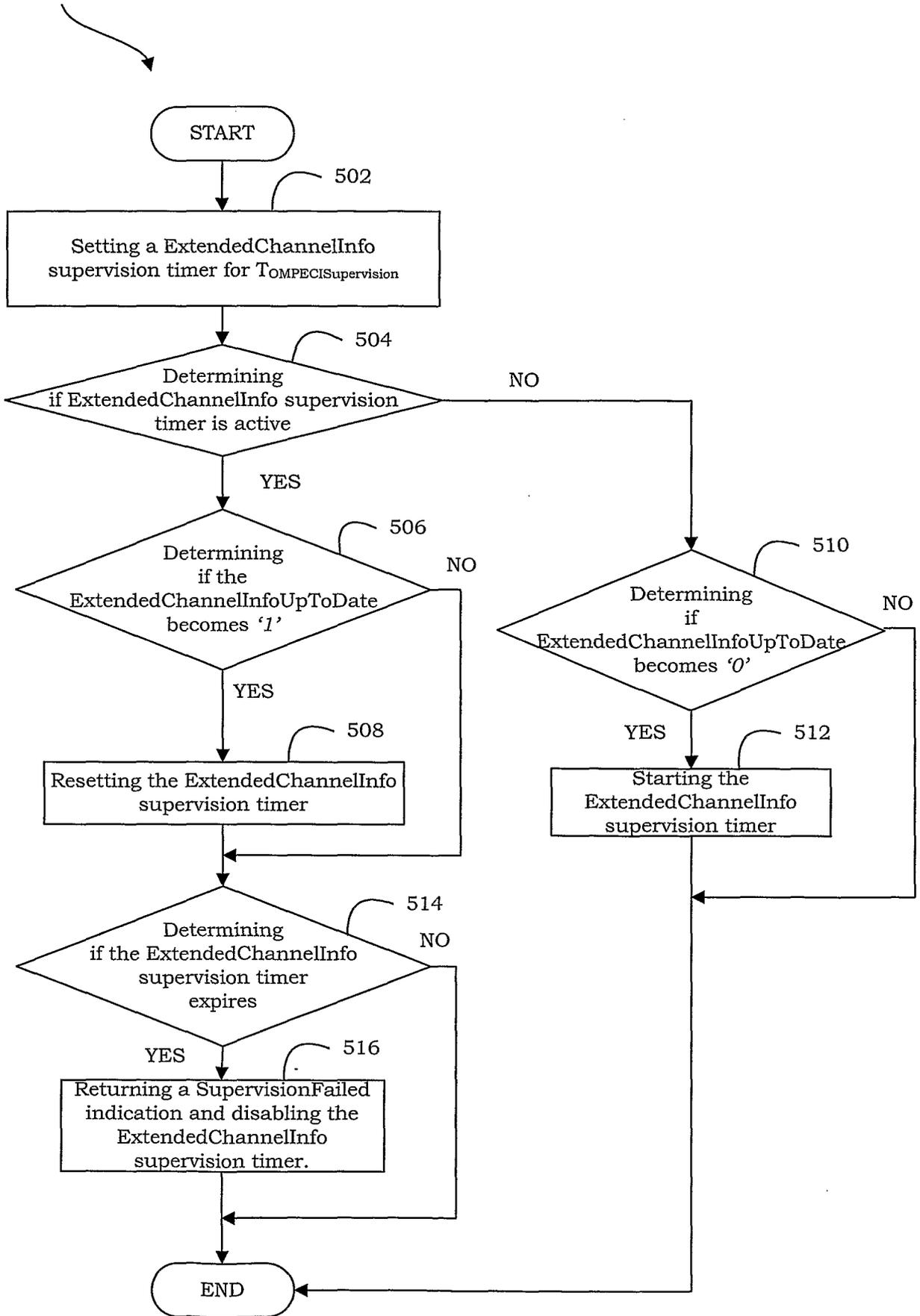


Fig. 5A

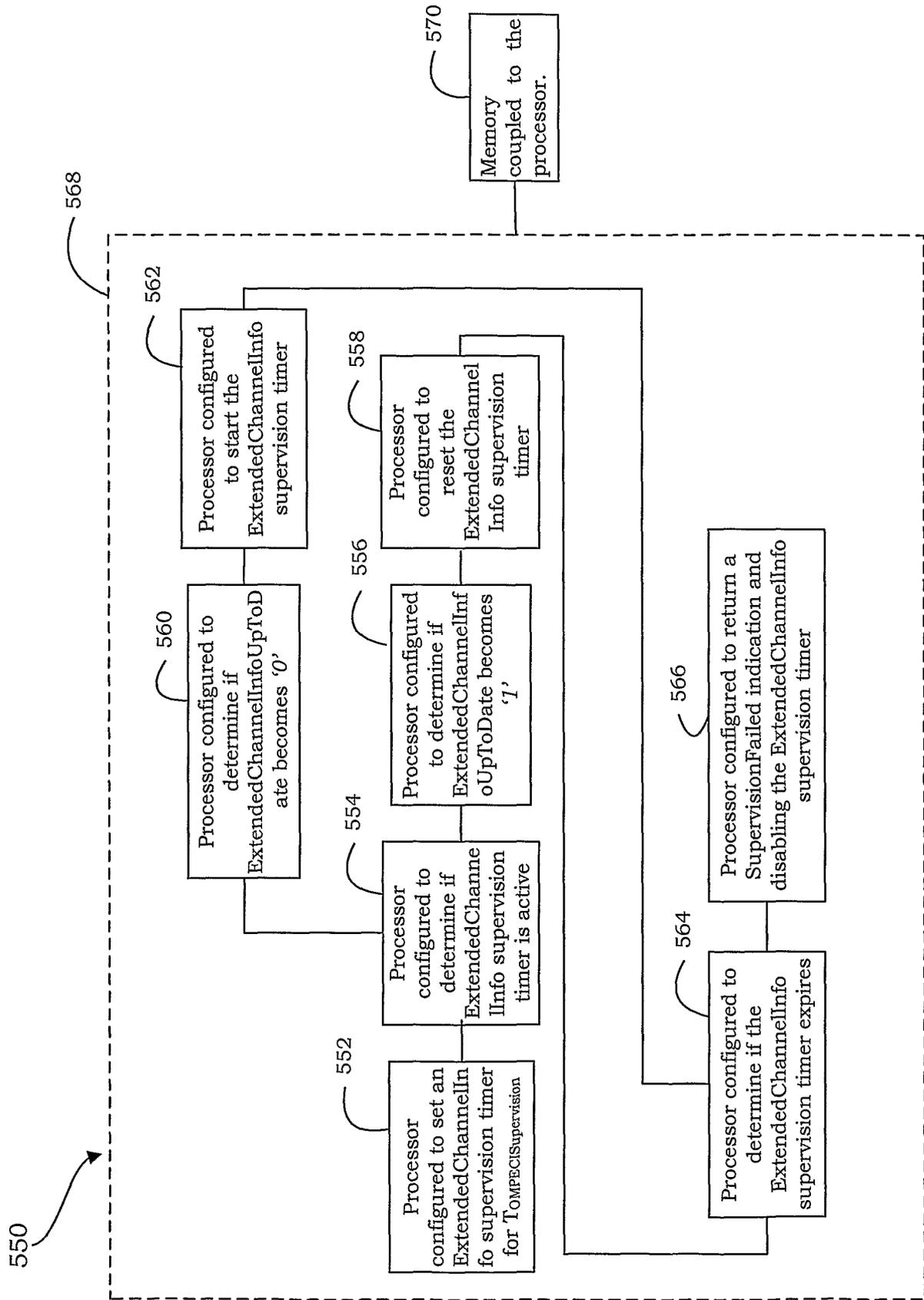


Fig. 5B

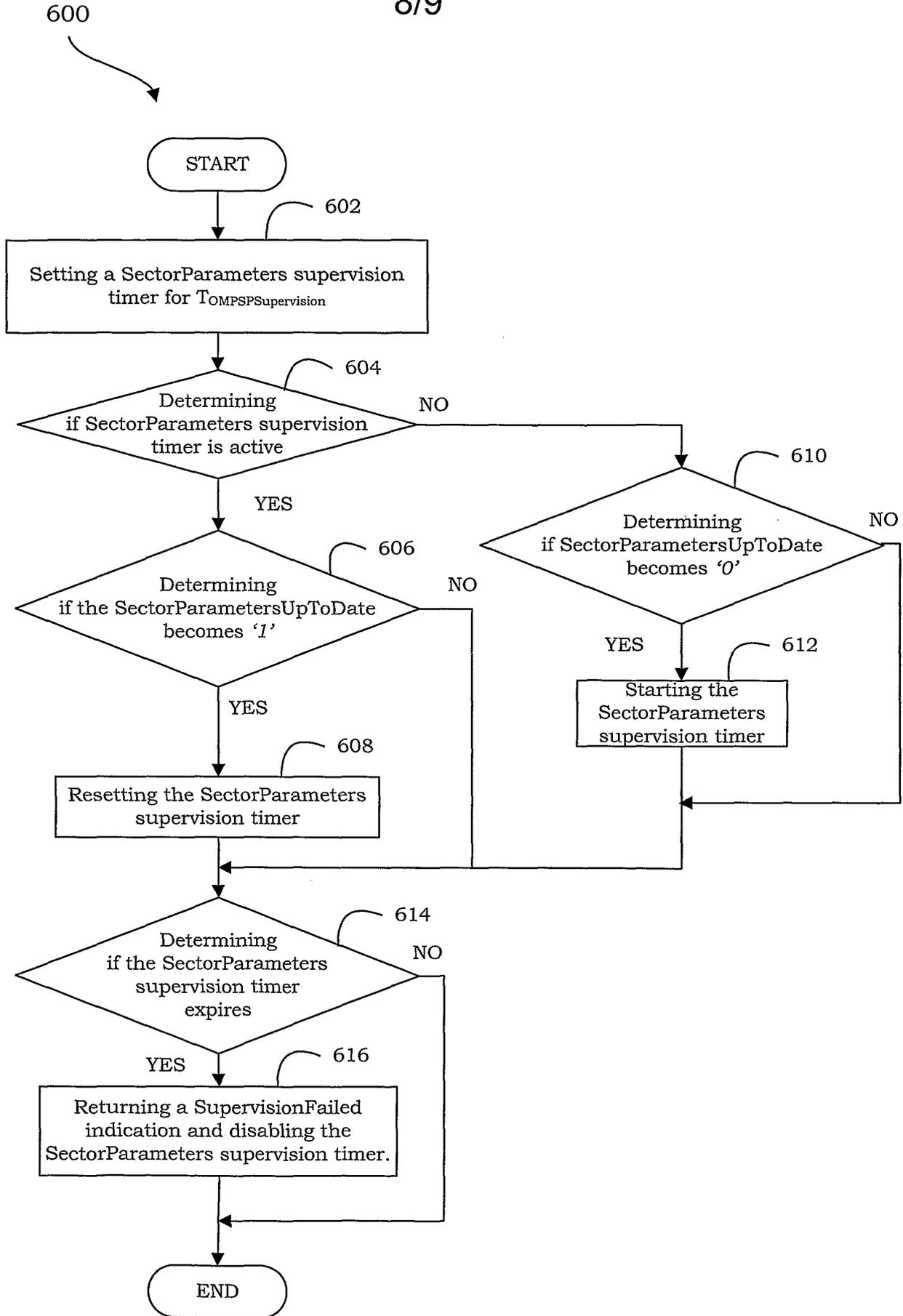


Fig. 6A

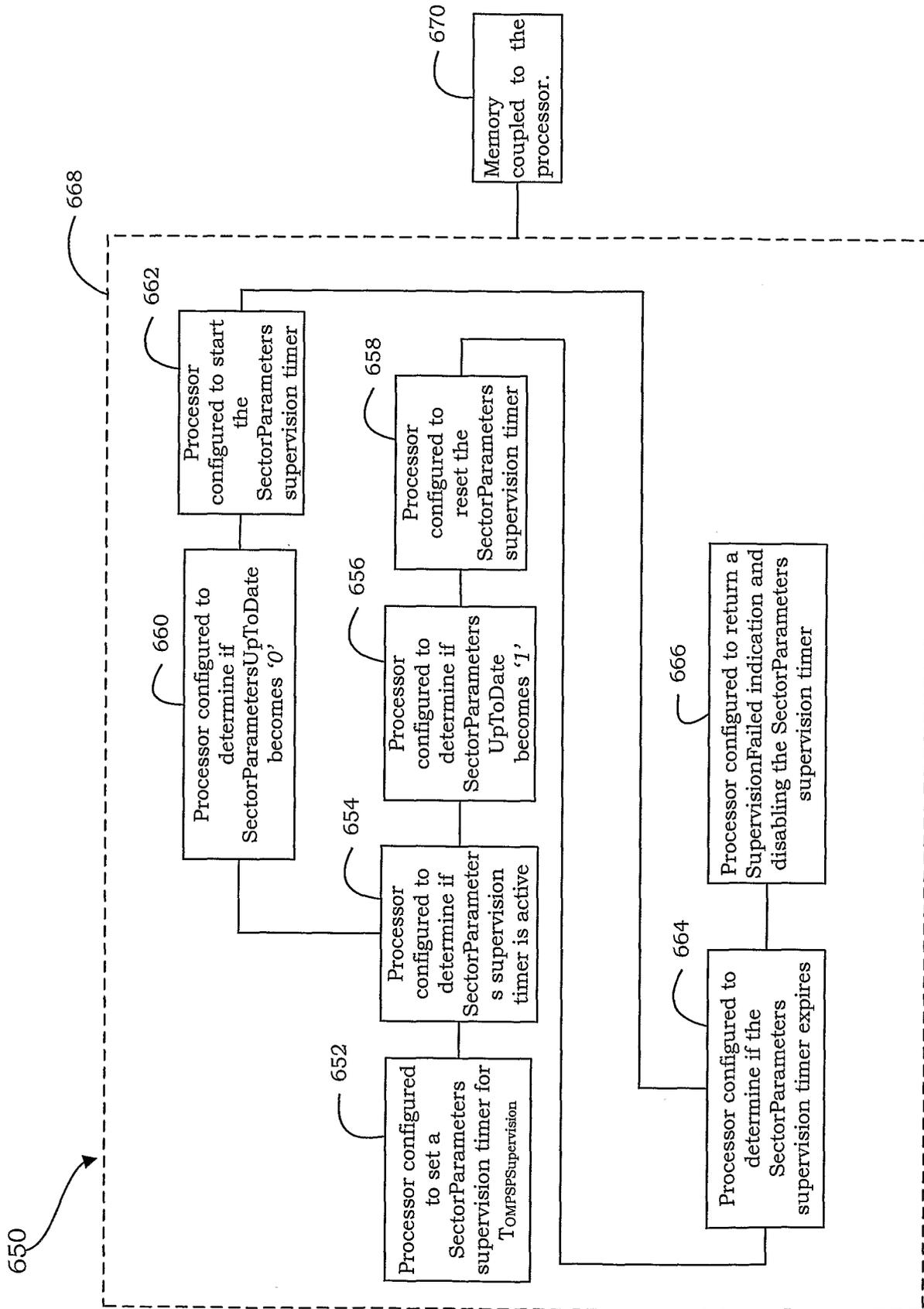


Fig. 6B