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(54) **SSB TRANSMISSION FOR TRANSITION PERIOD FOR SCELL OPERATION**

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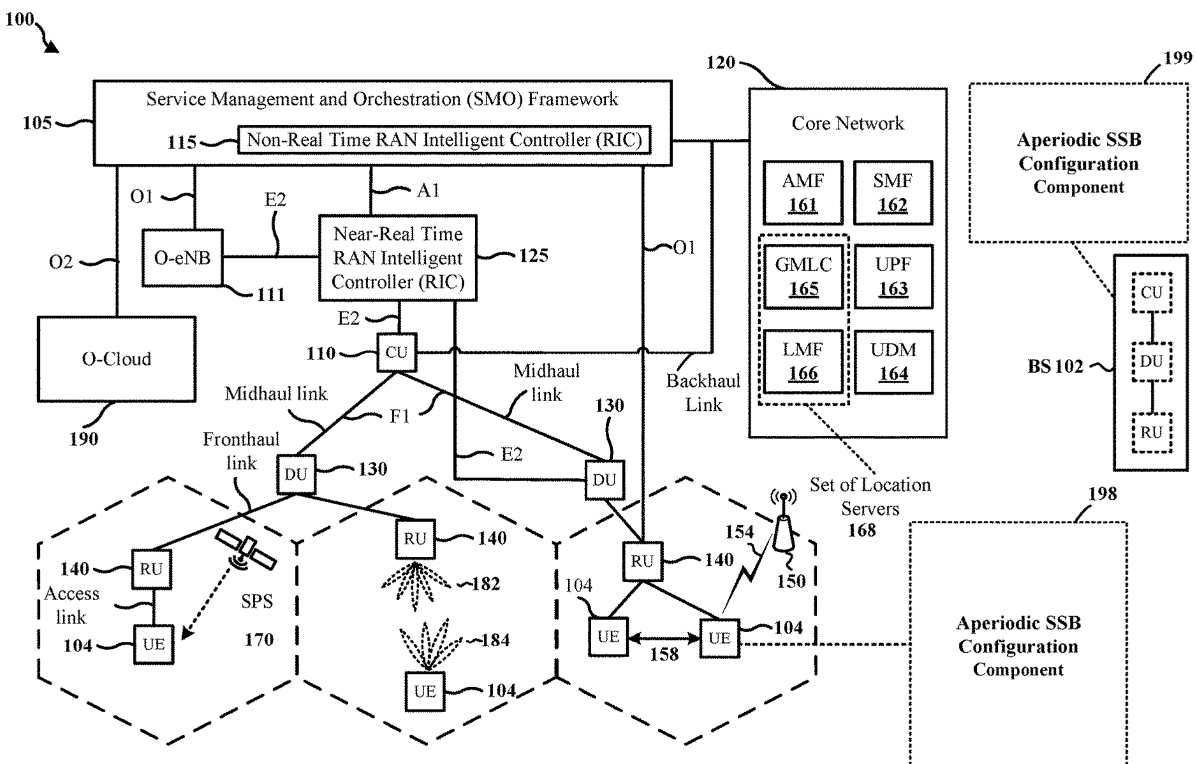
(52) **U.S. Cl.**

CPC .................................. *H04W 48/16* (2013.01)

(57) **ABSTRACT**

The apparatus may be a wireless device configured to receive a configuration for SSBs associated with a SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE and measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. The apparatus may be a network device configured to output a configuration for SSBs from a SCell associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a UE, and output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration.



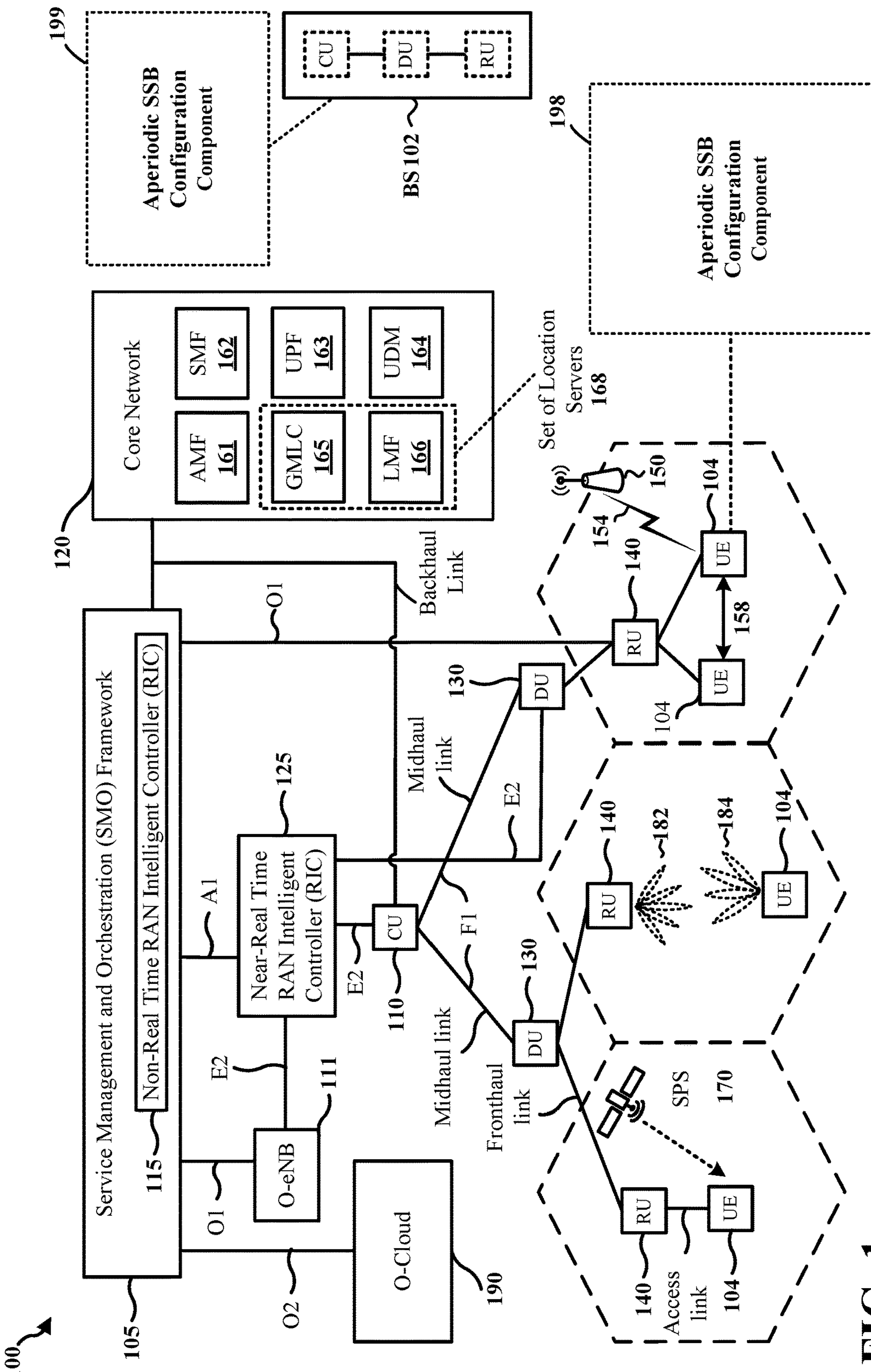

100
105
Service Management and Orchestration (SMO) Framework
Non-Real Time RAN Intelligent Controller (RIC)
115
O1
O2
A1
E2
O-eNB
111
O-Cloud
190
Near-Real Time RAN Intelligent Controller (RIC)
125
E2
CU
110
F1
Midhaul link
DU
130
Fronthaul link
RU
140
Access link
UE
104
SPS
170
182
184
Midhaul link
E2
Backhaul Link
O1
158
154
150
120
Core Network
AMF 161
SMF 162
GMLC 165
UPF 163
LMF 166
UDM 164
Set of Location Servers 168
198
Aperiodic SSB Configuration Component
199
Aperiodic SSB Configuration Component
CU
DU
RU
BS 102

FIG. 1

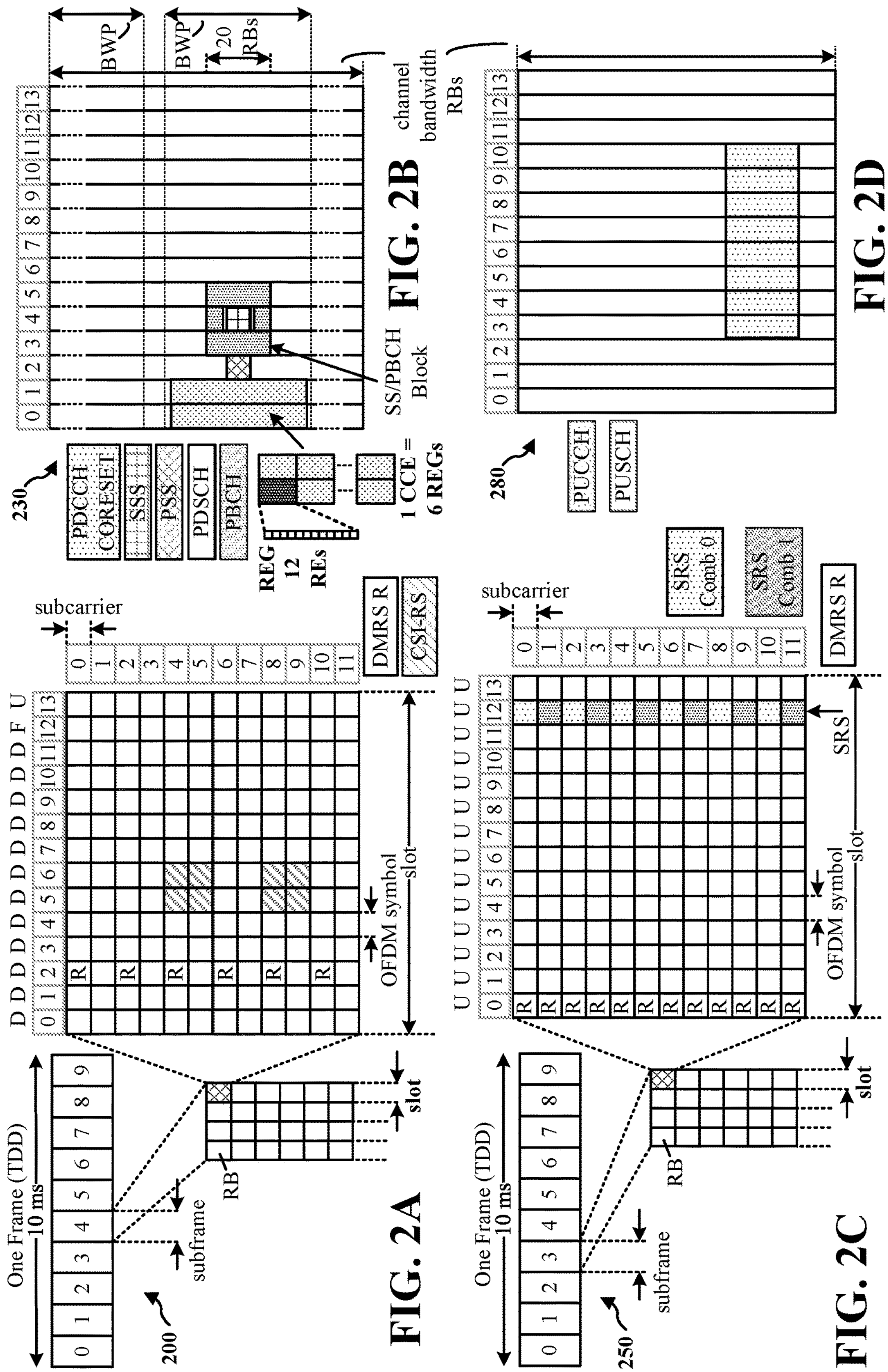



FIG. 2A

FIG. 2B

FIG. 2C

FIG. 2D

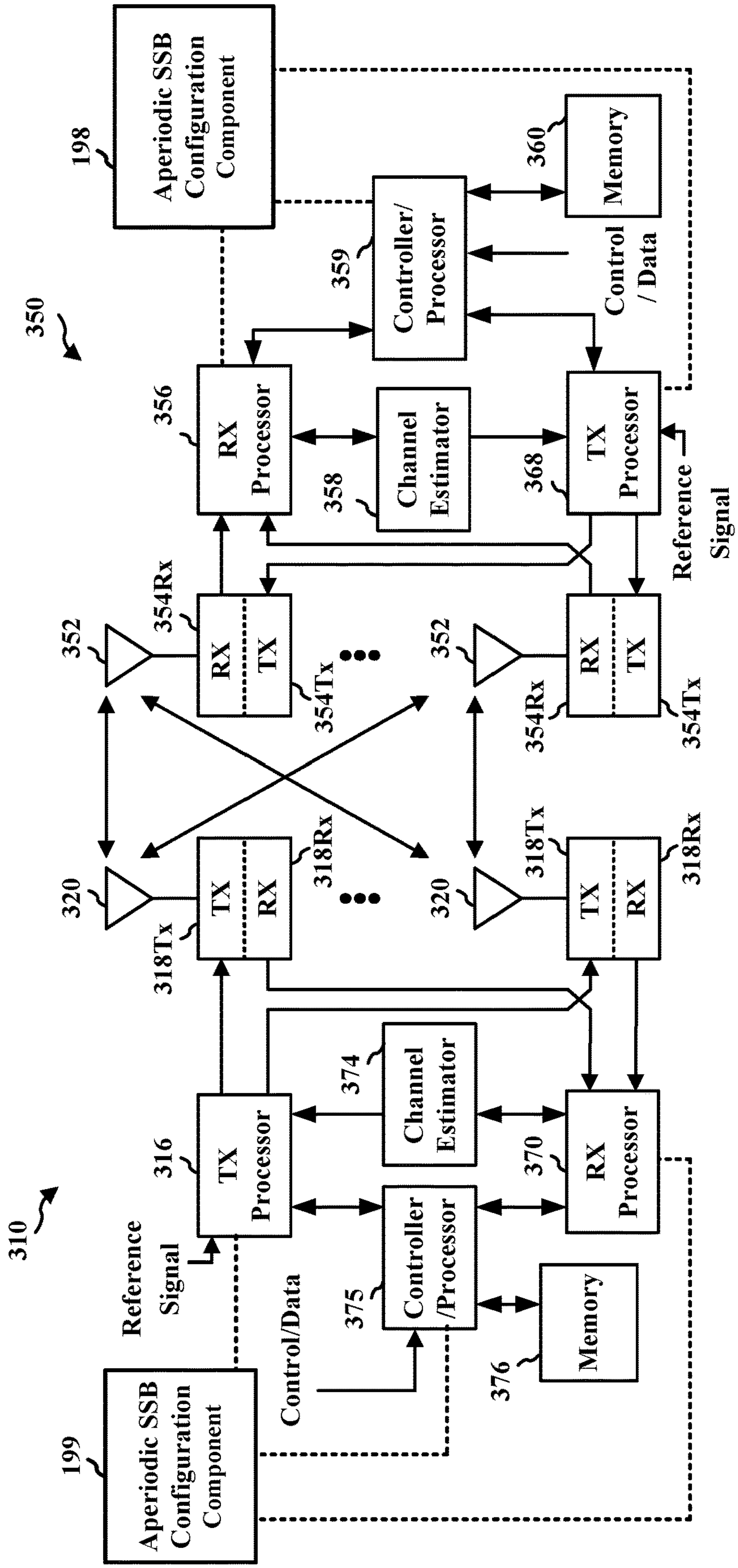

350
198
Aperiodic SSB Configuration Component
359
Controller/ Processor
360
Memory
Control / Data
356
RX Processor
358
Channel Estimator
368
TX Processor
Reference Signal
352
354Rx
RX
TX
354Tx
352
354Rx
RX
TX
354Tx
320
318Tx
TX
RX
318Rx
320
318Tx
TX
RX
318Rx
310
316
TX Processor
374
Channel Estimator
370
RX Processor
375
Controller /Processor
376
Memory
Reference Signal
Control/Data
199
Aperiodic SSB Configuration Component

FIG. 3

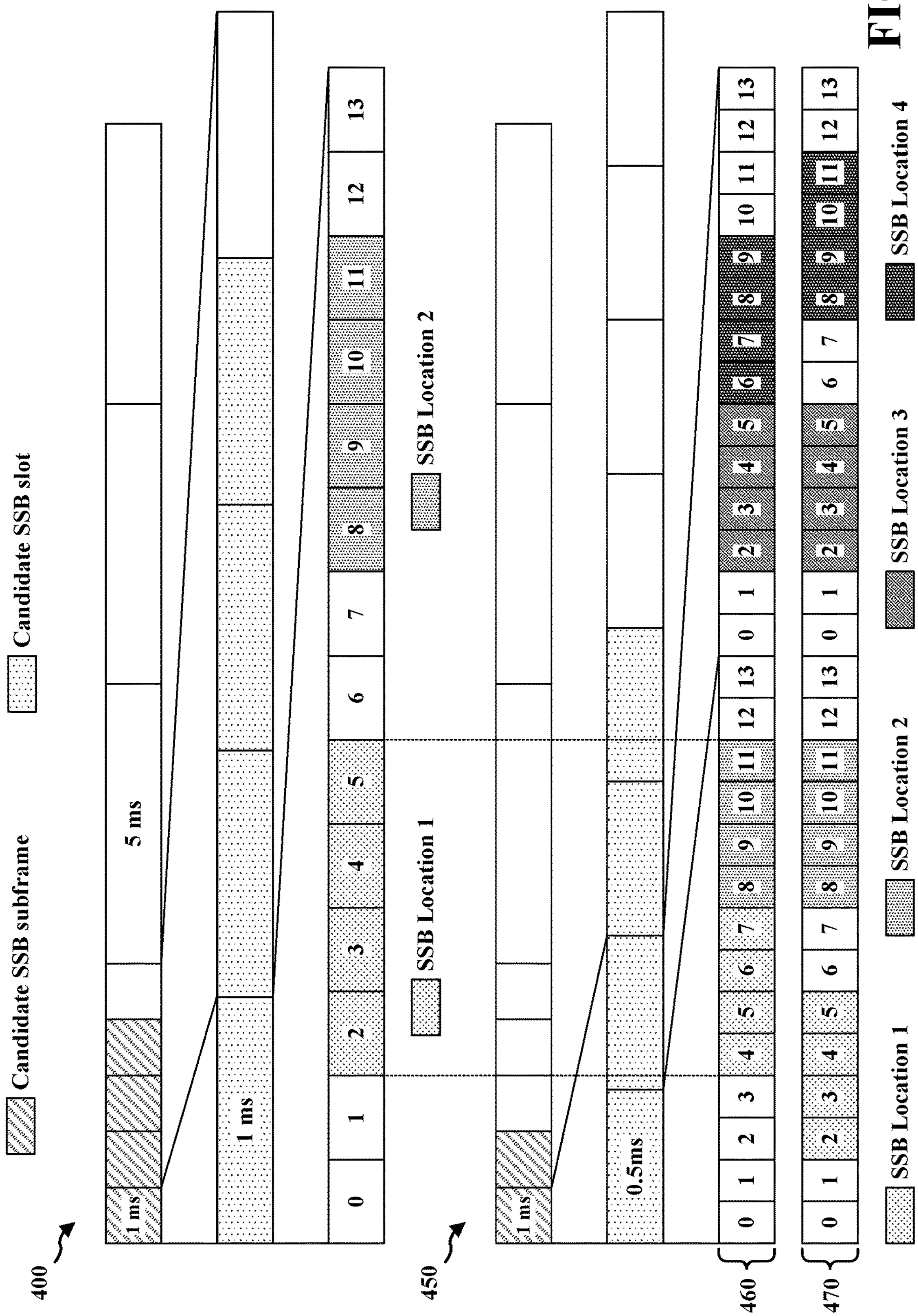

400
450
460
470
Candidate SSB subframe
Candidate SSB slot
1 ms
5 ms
1 ms
0.5ms
0 1 2 3 4 5 6 7 8 9 10 11 12 13
SSB Location 1
SSB Location 2
SSB Location 3
SSB Location 4

FIG. 4

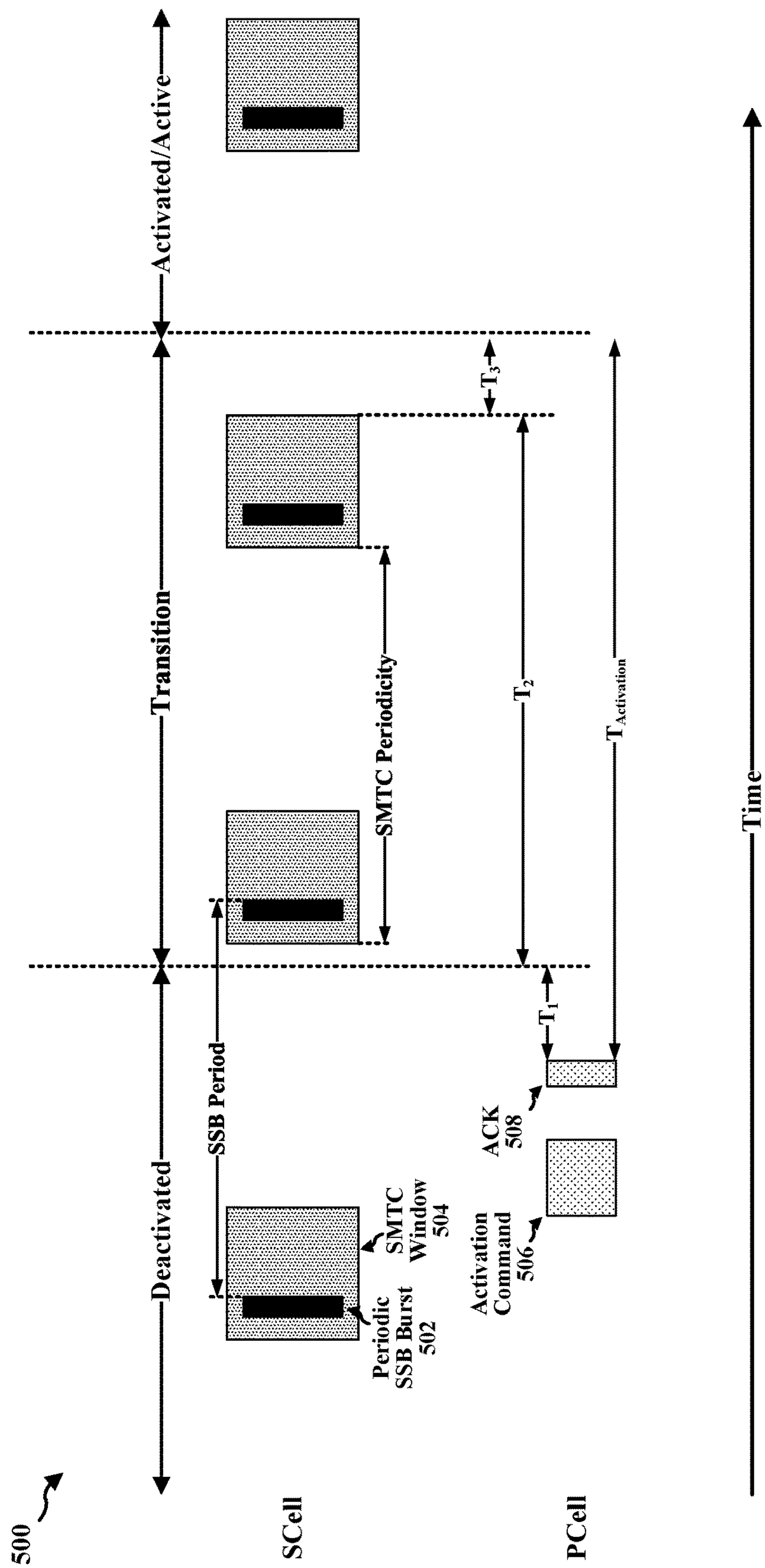

500
SCell
PCell
Deactivated
Transition
Activated/Active
Periodic SSB Burst 502
SMTC Window 504
SSB Period
SMTC Periodicity
Activation Command 506
ACK 508
$T_1$
$T_2$
$T_3$
$T_{Activation}$
Time

FIG. 5

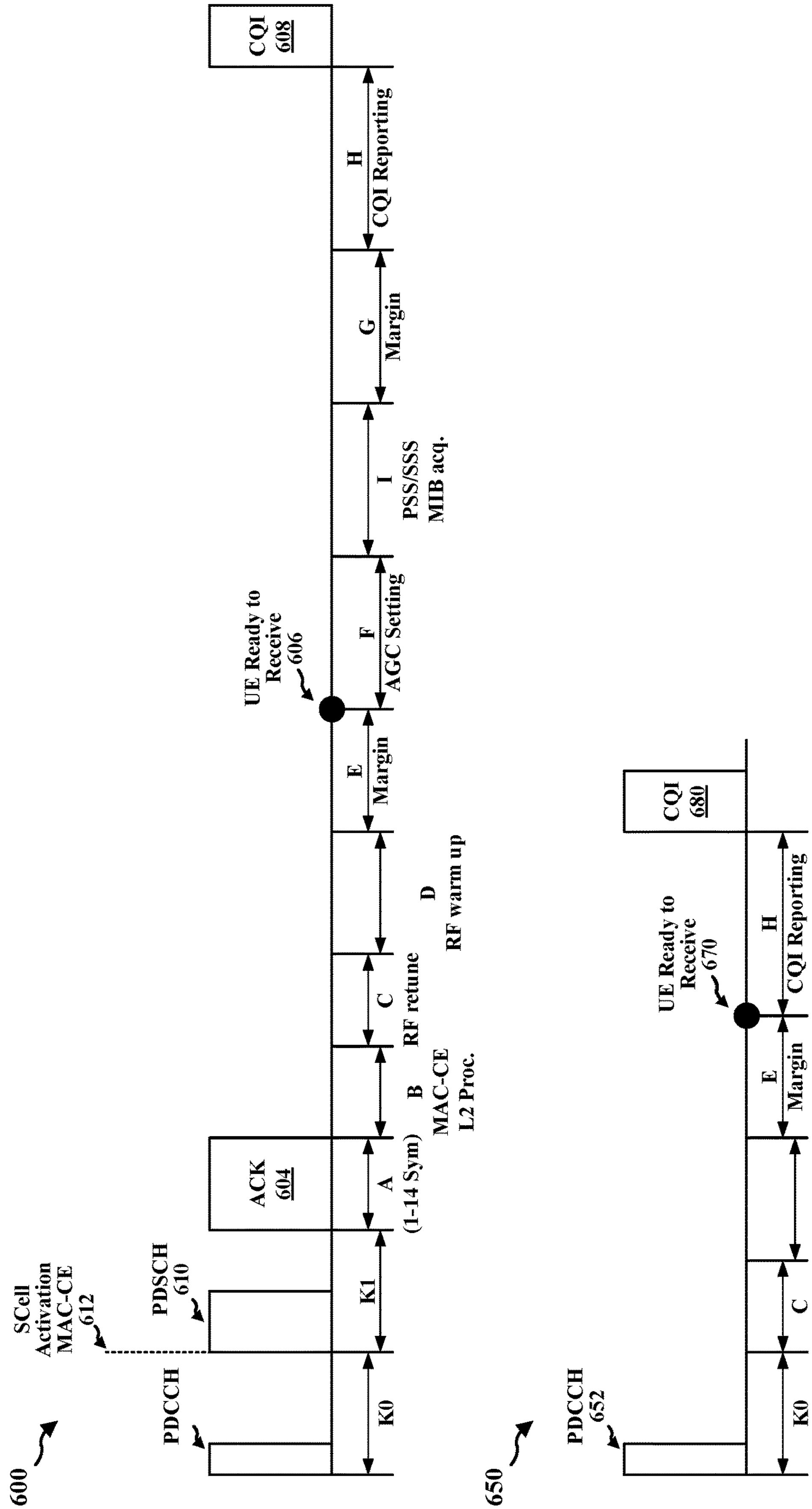

600
PDCCH
SCell Activation MAC-CE 612
PDSCH 610
K0
K1
ACK 604
A (1-14 Sym)
B MAC-CE L2 Proc.
C RF retune
D RF warm up
E Margin
UE Ready to Receive 606
F AGC Setting
I PSS/SSS MIB acq.
G Margin
H CQI Reporting
CQI 608
650
PDCCH 652
K0
C RF retune
D RF warm up
E Margin
UE Ready to Receive 670
H CQI Reporting
CQI 680

FIG. 6

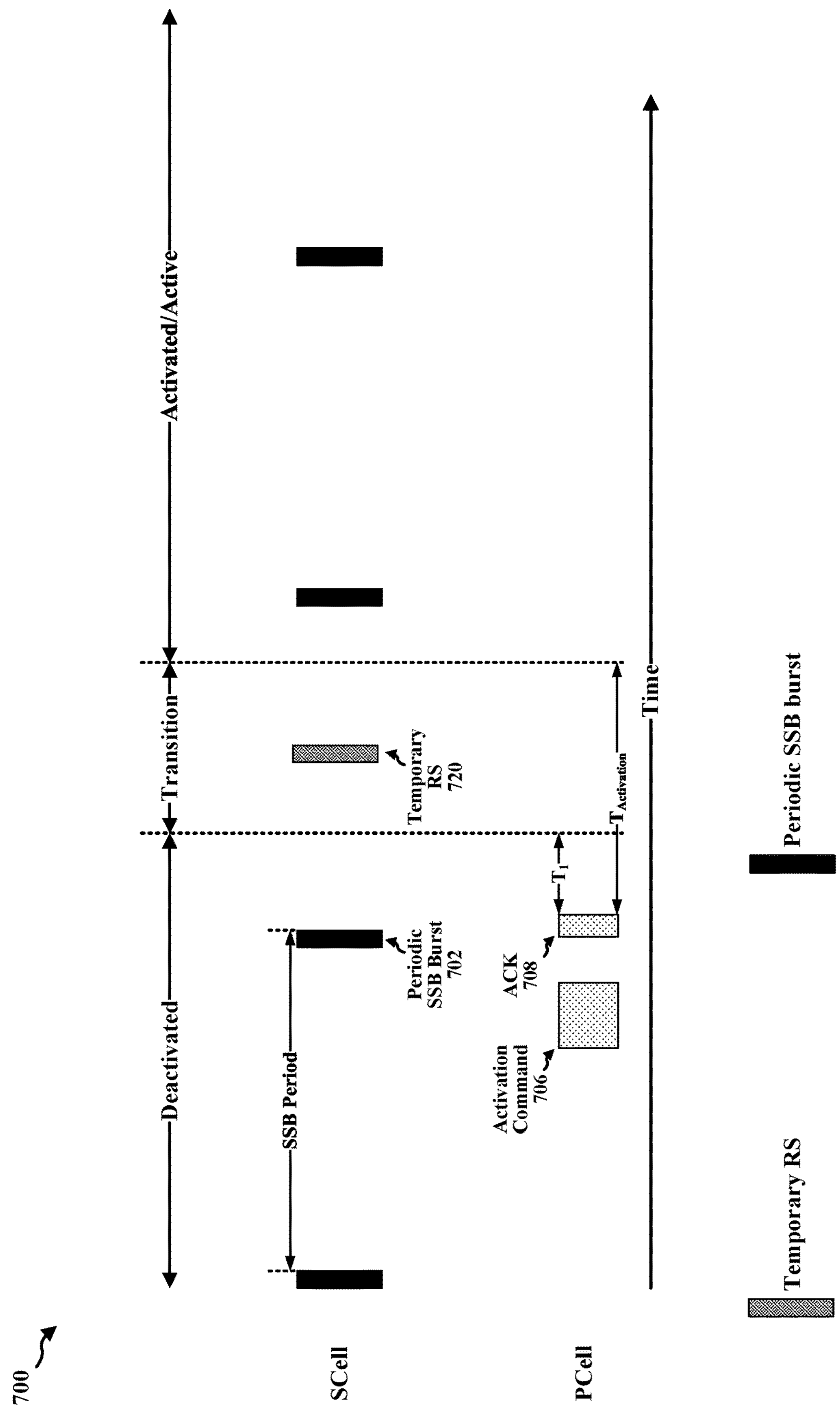

700
SCell
PCell
Deactivated
Transition
Activated/Active
SSB Period
Periodic SSB Burst 702
Activation Command 706
ACK 708
$T_1$
$T_{Activation}$
Temporary RS 720
Time
Temporary RS
Periodic SSB burst

FIG. 7

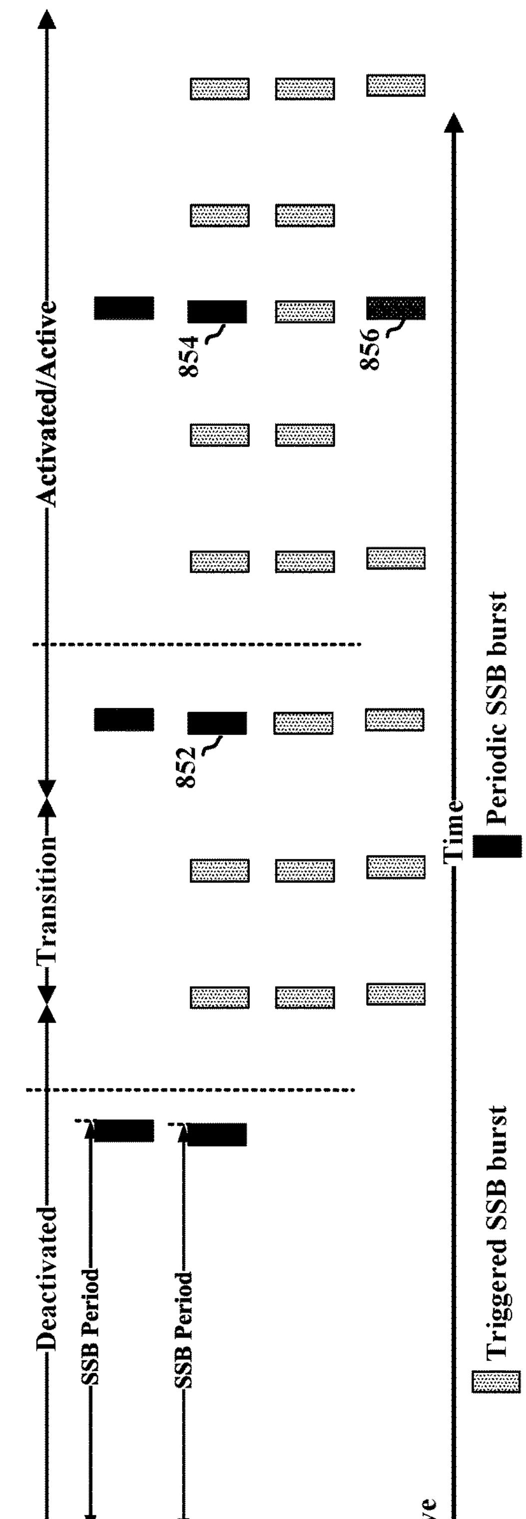

850
Always on periodic SSB
Sparse SSB in deactivated cell
No SSB in deactivated cell
Denser SSB in transition than active
Deactivated
Transition
Activated/Active
SSB Period
SSB Period
852
854
856
Time
Triggered SSB burst
Periodic SSB burst

FIG. 8A

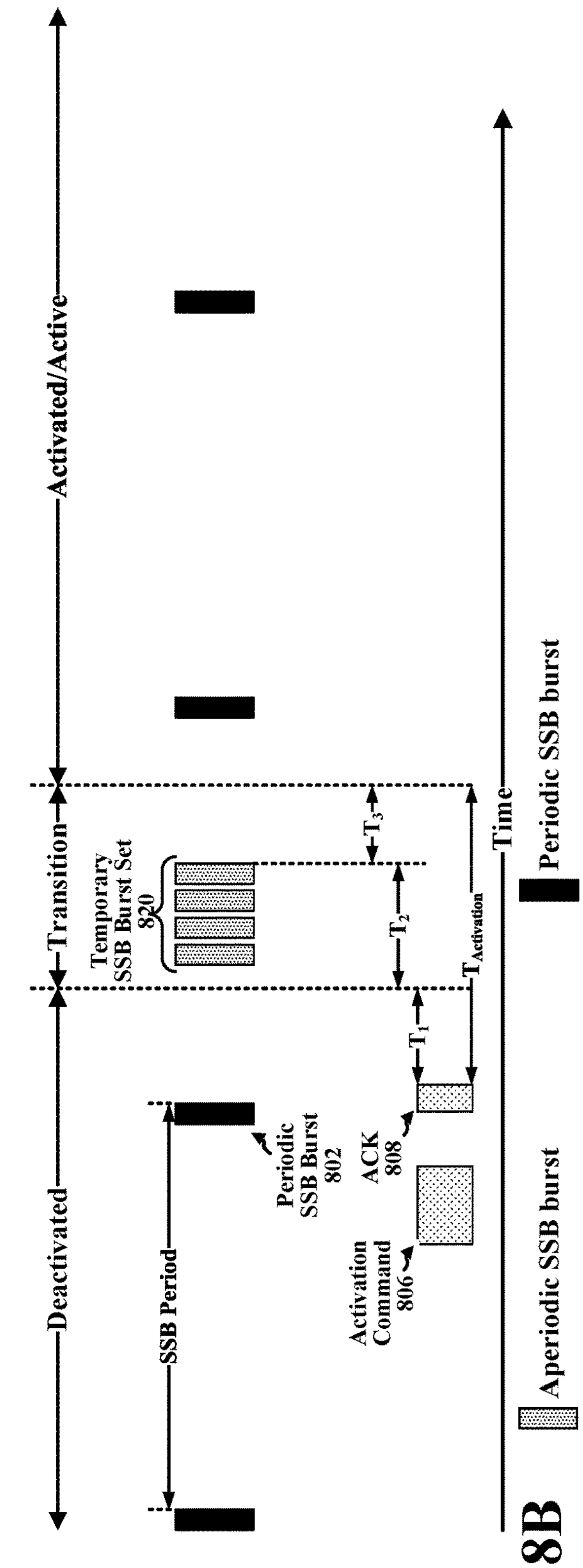

800
SCell
PCell
Deactivated
Transition
Activated/Active
SSB Period
Periodic SSB Burst 802
Activation Command 806
ACK 808
Temporary SSB Burst Set 820
$T_1$
$T_2$
$T_3$
$T_{Activation}$
Time
Aperiodic SSB burst
Periodic SSB burst

FIG. 8B

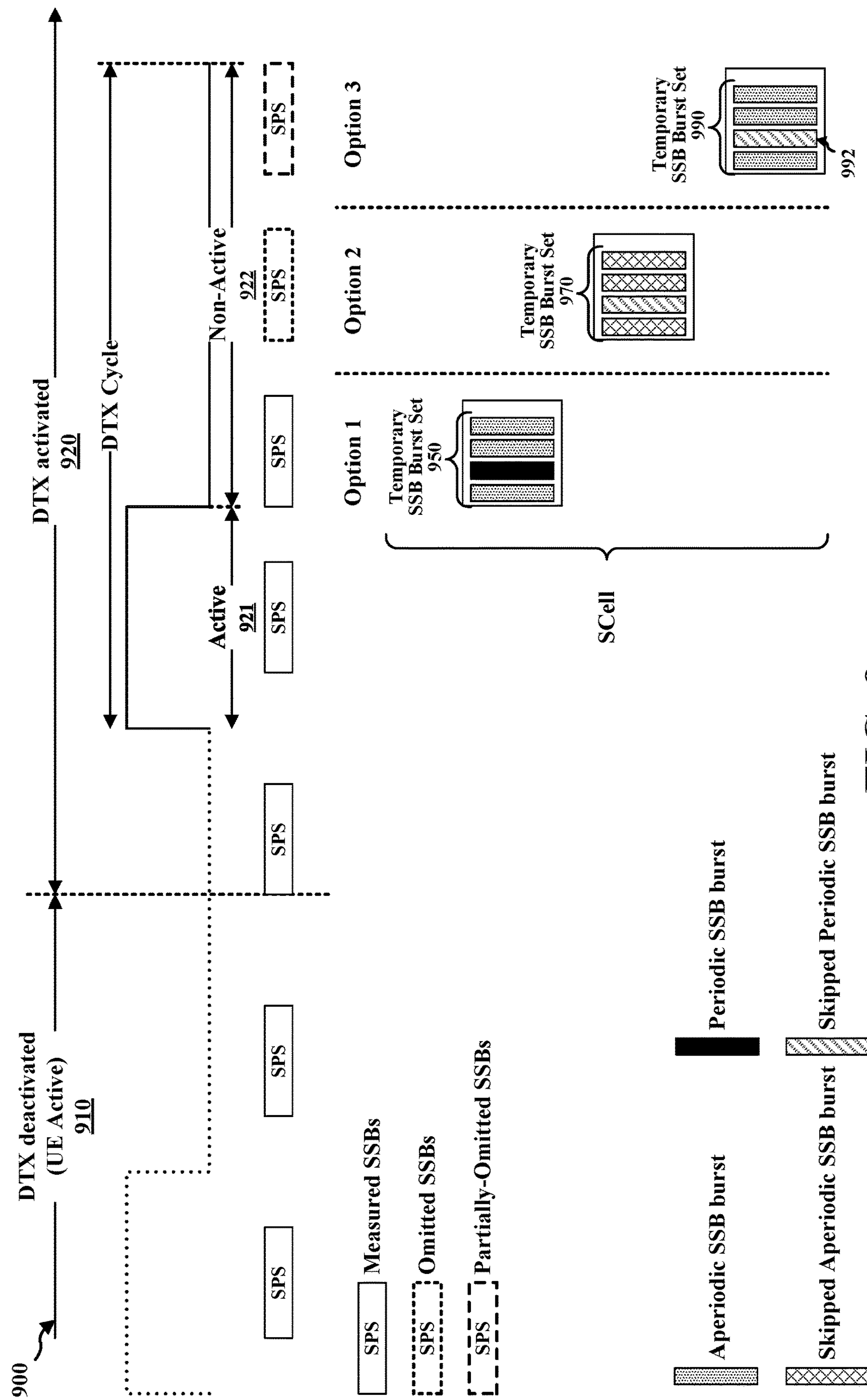

900
DTX deactivated
(UE Active)
910
DTX activated
920
DTX Cycle
Active
921
Non-Active
922
SPS
SPS
SPS
SPS
SPS
SPS
SPS
SPS
Option 1
Option 2
Option 3
Temporary
SSB Burst Set
950
Temporary
SSB Burst Set
970
Temporary
SSB Burst Set
990
992
SCell
SPS Measured SSBs
SPS Omitted SSBs
SPS Partially-Omitted SSBs
Aperiodic SSB burst
Periodic SSB burst
Skipped Aperiodic SSB burst
Skipped Periodic SSB burst

FIG. 9

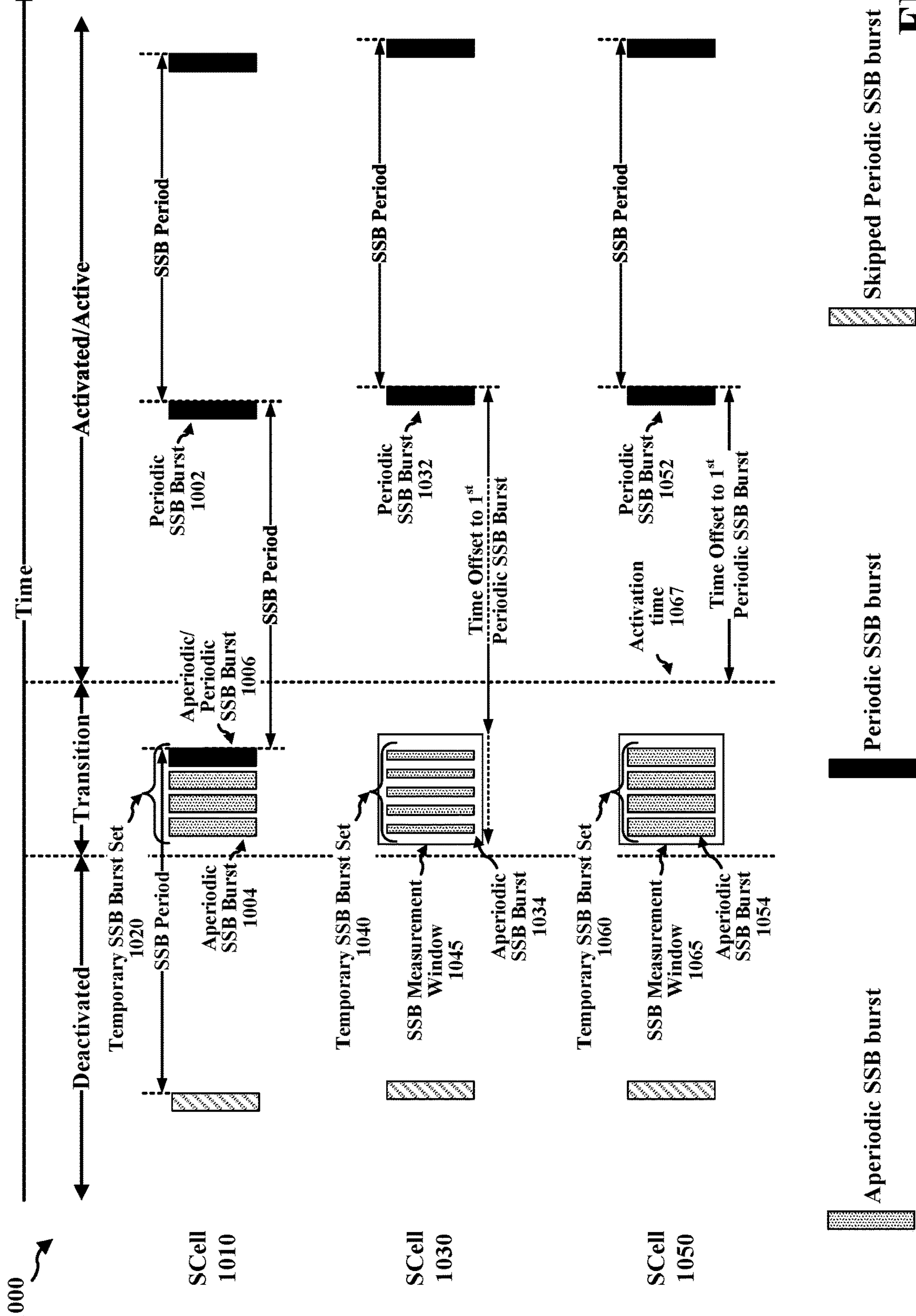

1000
Time
Deactivated
Transition
Activated/Active
SCell 1010
SCell 1030
SCell 1050
Temporary SSB Burst Set 1020
SSB Period
Aperiodic SSB Burst 1004
Aperiodic/ Periodic SSB Burst 1006
SSB Period
Periodic SSB Burst 1002
SSB Period
Temporary SSB Burst Set 1040
SSB Measurement Window 1045
Aperiodic SSB Burst 1034
Time Offset to 1st Periodic SSB Burst
Periodic SSB Burst 1032
SSB Period
Temporary SSB Burst Set 1060
SSB Measurement Window 1065
Aperiodic SSB Burst 1054
Activation time 1067
Time Offset to 1st Periodic SSB Burst
Periodic SSB Burst 1052
SSB Period
Aperiodic SSB burst
Periodic SSB burst
Skipped Periodic SSB burst

FIG. 10

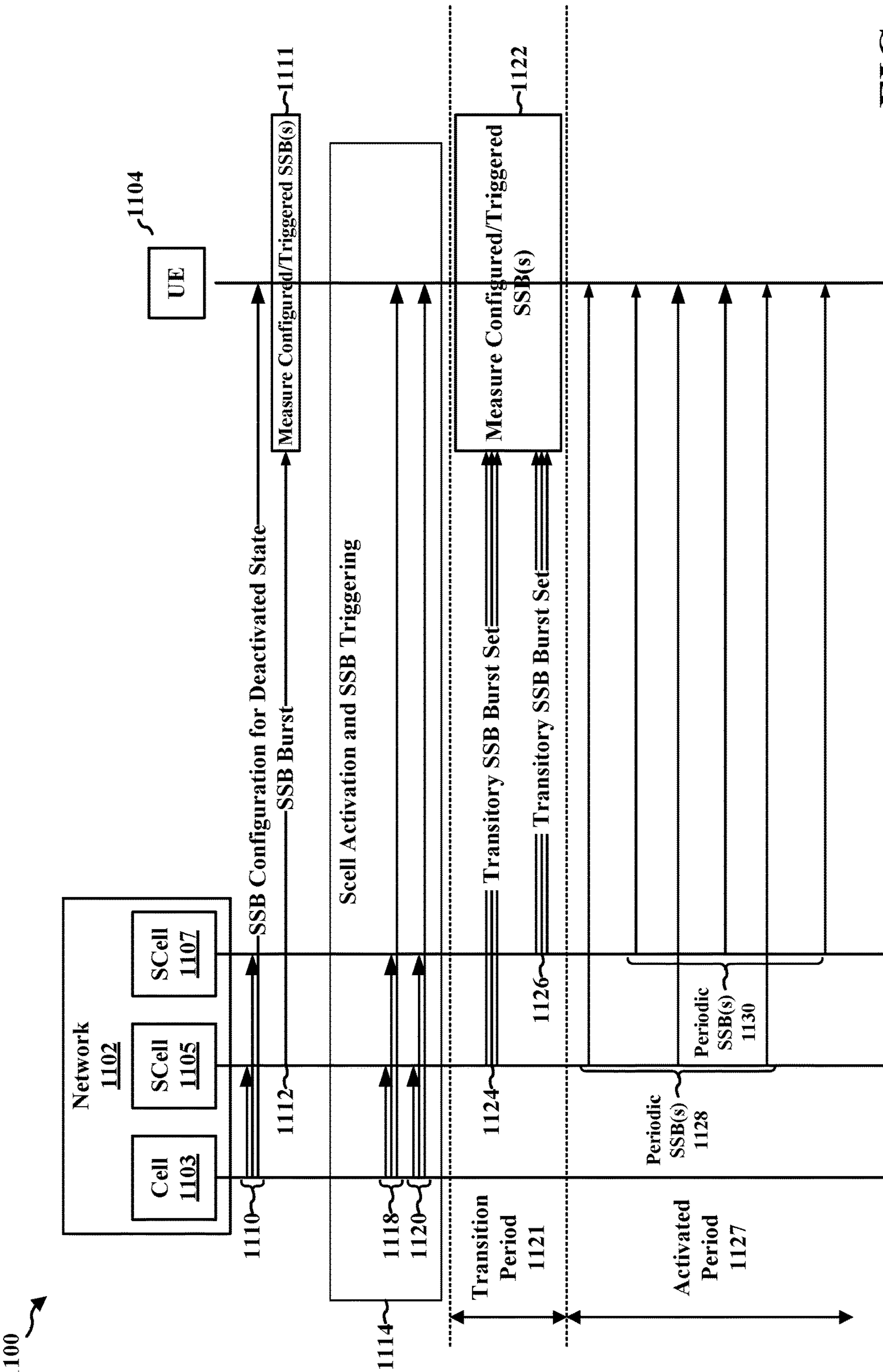

1100
Network
1102
Cell
1103
SCell
1105
SCell
1107
UE
1104
1110
SSB Configuration for Deactivated State
1112
SSB Burst
Measure Configured/Triggered SSB(s)
1111
1114
Scell Activation and SSB Triggering
1118
1120
Transition
Period
1121
1124
Transitory SSB Burst Set
1126
Transitory SSB Burst Set
Measure Configured/Triggered
SSB(s)
1122
Activated
Period
1127
Periodic
SSB(s)
1128
Periodic
SSB(s)
1130

FIG. 11

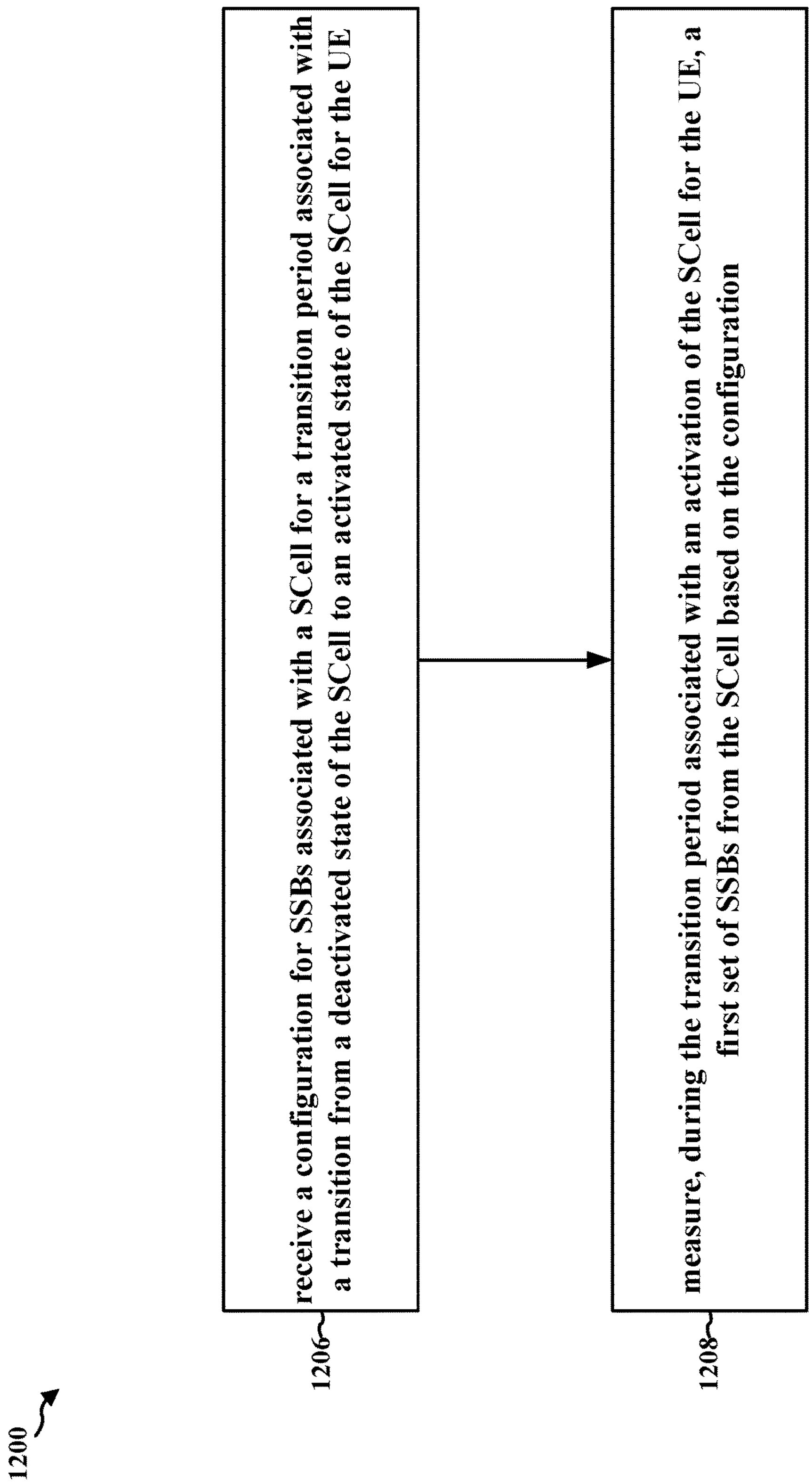

1200
1206
receive a configuration for SSBs associated with a SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE
1208
measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration

FIG. 12

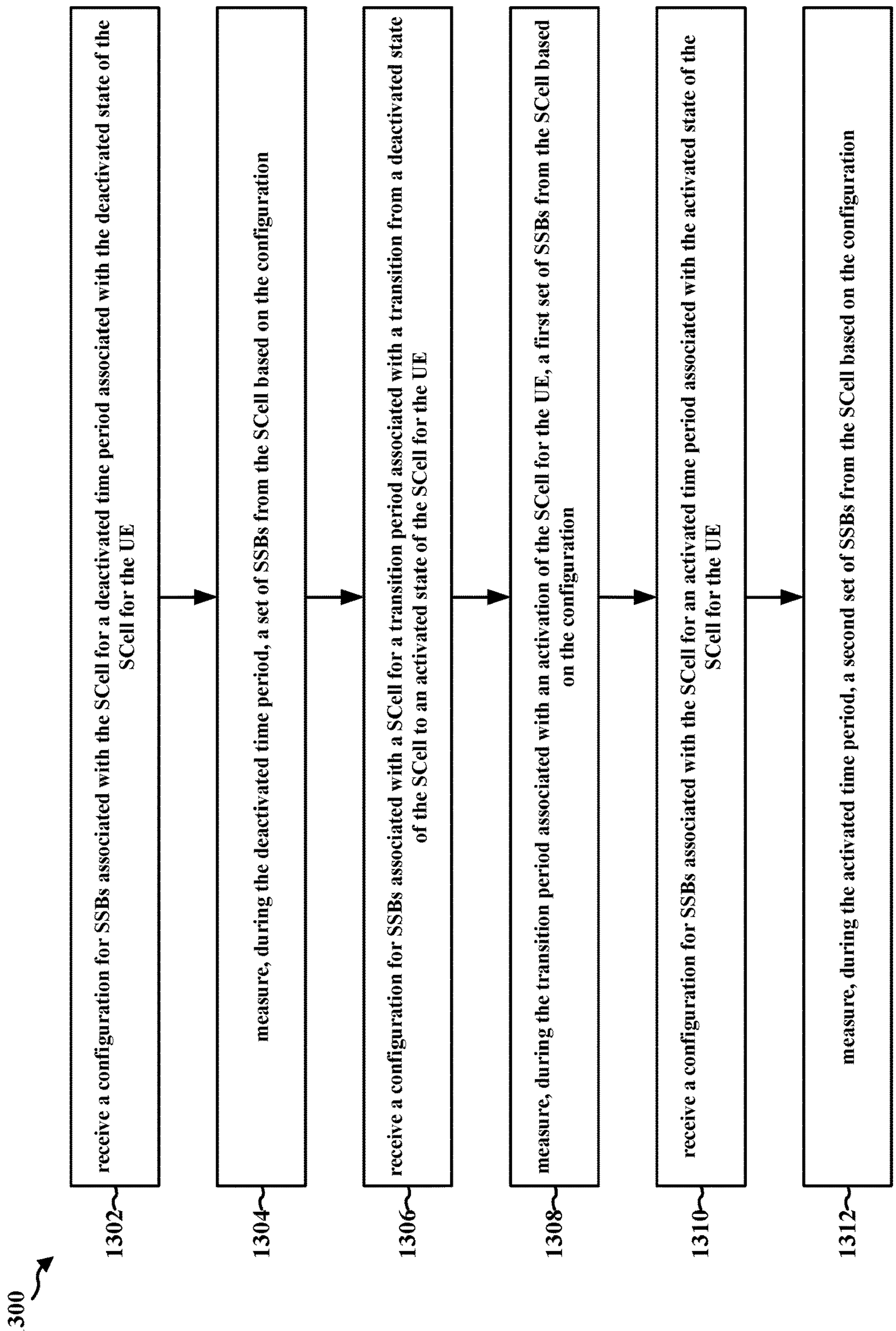

1300
1302
receive a configuration for SSBs associated with the SCell for a deactivated time period associated with the deactivated state of the SCell for the UE
1304
measure, during the deactivated time period, a set of SSBs from the SCell based on the configuration
1306
receive a configuration for SSBs associated with a SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE
1308
measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration
1310
receive a configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE
1312
measure, during the activated time period, a second set of SSBs from the SCell based on the configuration

FIG. 13

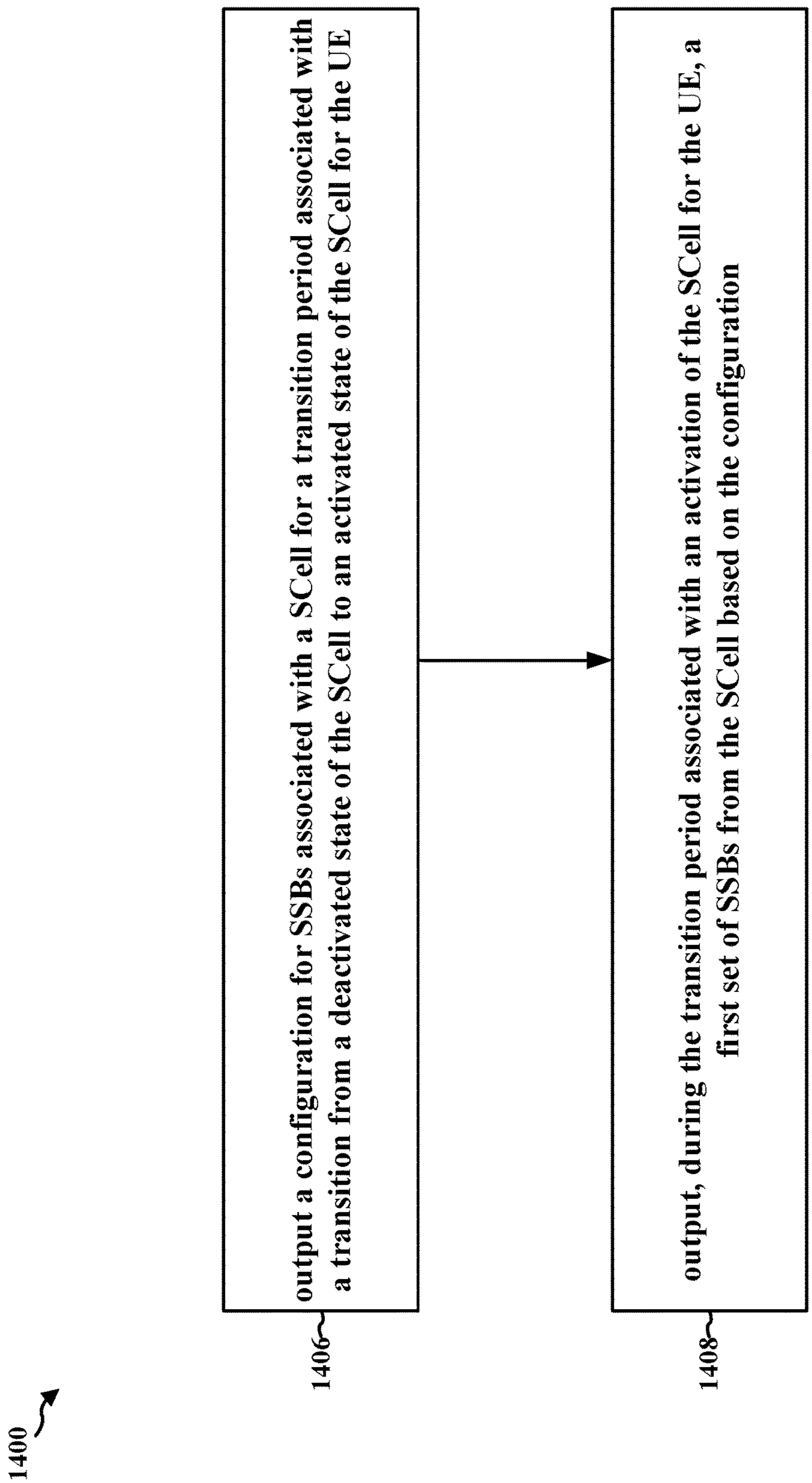

1400
1406
output a configuration for SSBs associated with a SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE
1408
output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration

FIG. 14

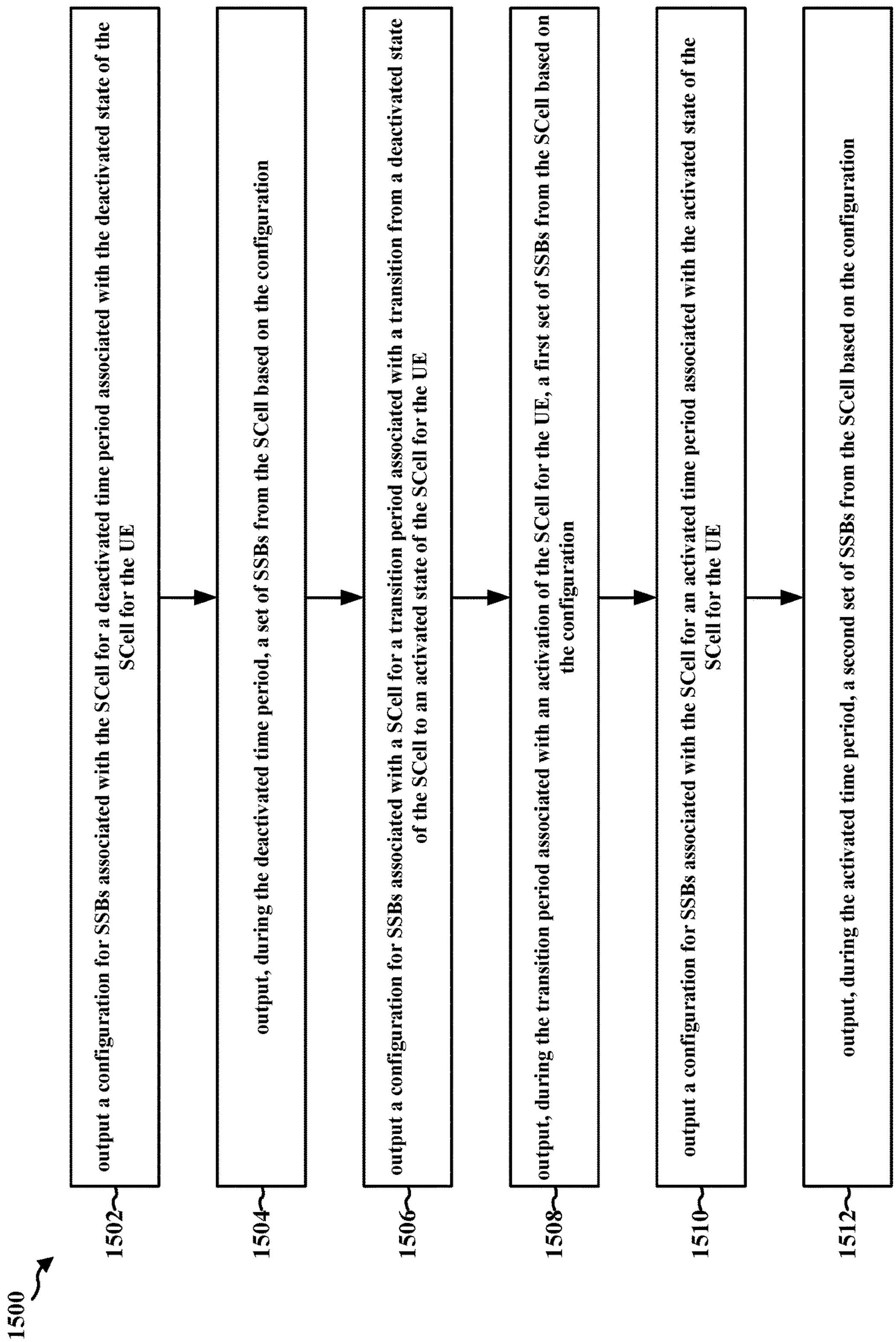

1500
1502
output a configuration for SSBs associated with the SCell for a deactivated time period associated with the deactivated state of the SCell for the UE
1504
output, during the deactivated time period, a set of SSBs from the SCell based on the configuration
1506
output a configuration for SSBs associated with a SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE
1508
output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration
1510
output a configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE
1512
output, during the activated time period, a second set of SSBs from the SCell based on the configuration

FIG. 15

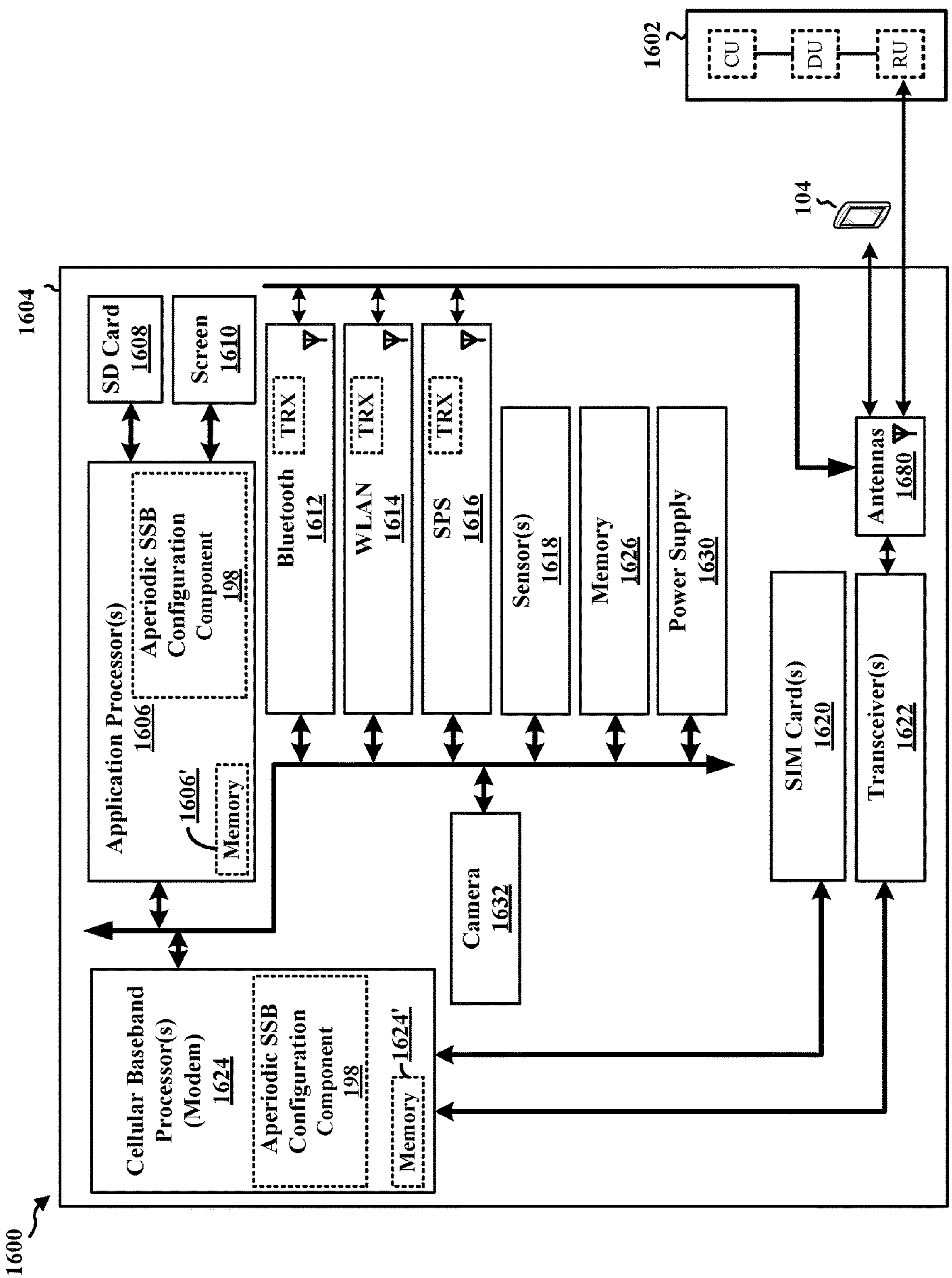

1600
1604
SD Card 1608
Screen 1610
Application Processor(s) 1606
Aperiodic SSB Configuration Component 198
1606'
Memory
Bluetooth 1612
TRX
WLAN 1614
TRX
SPS 1616
TRX
Sensor(s) 1618
Memory 1626
Power Supply 1630
Camera 1632
Cellular Baseband Processor(s) (Modem) 1624
Aperiodic SSB Configuration Component 198
1624'
Memory
SIM Card(s) 1620
Transceiver(s) 1622
Antennas 1680
104
1602
CU
DU
RU

FIG. 16

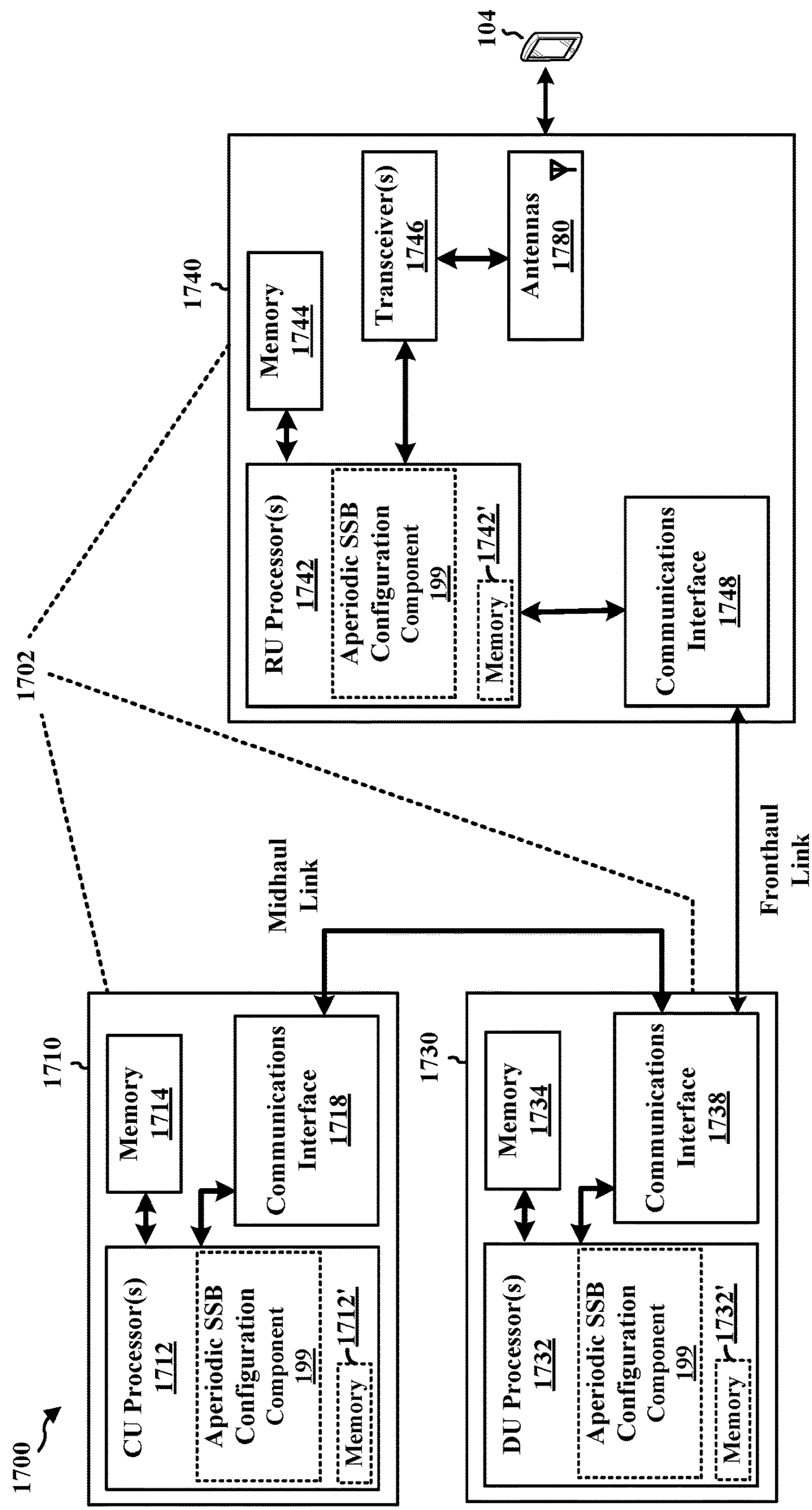

1700
1710
Memory
1714
Communications
Interface
1718
CU Processor(s)
1712
Aperiodic SSB
Configuration
Component
199
Memory
1712'
1730
Memory
1734
Communications
Interface
1738
DU Processor(s)
1732
Aperiodic SSB
Configuration
Component
199
Memory
1732'
Midhaul
Link
Fronthaul
Link
1702
1740
Memory
1744
Transceiver(s)
1746
Antennas
1780
RU Processor(s)
1742
Aperiodic SSB
Configuration
Component
199
Memory
1742'
Communications
Interface
1748
104

FIG. 17

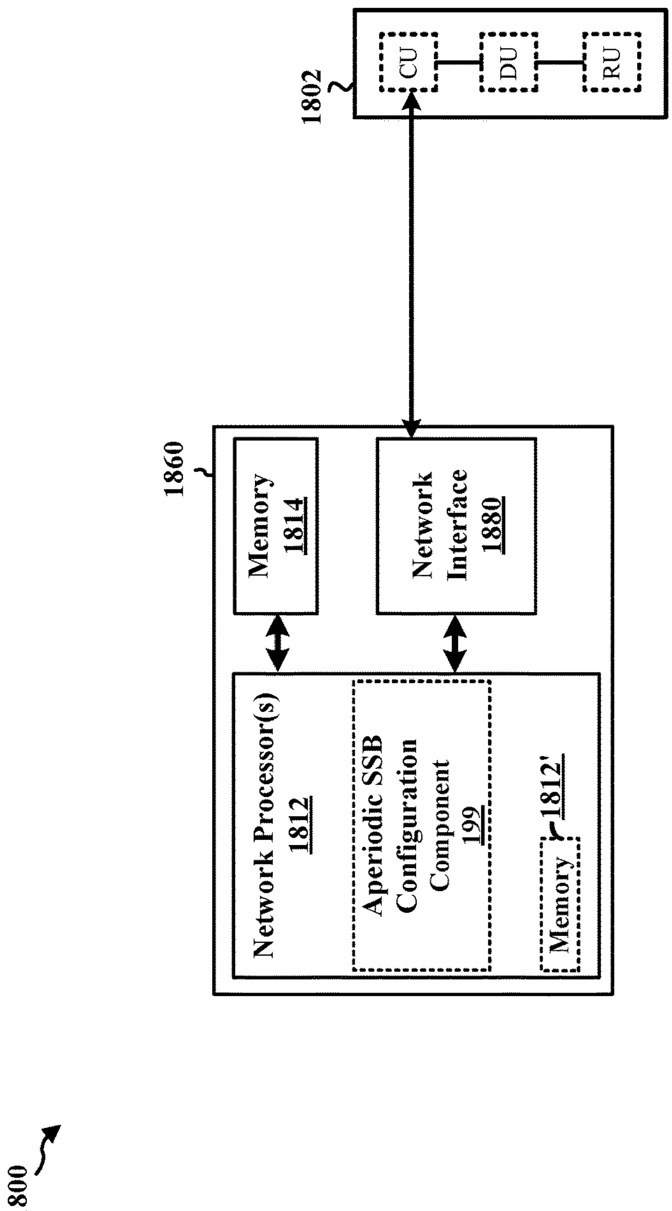

1800
1860
Memory
1814
Network
Interface
1880
Network Processor(s)
1812
Aperiodic SSB
Configuration
Component
199
Memory
1812'
1802
CU
DU
RU

FIG. 18

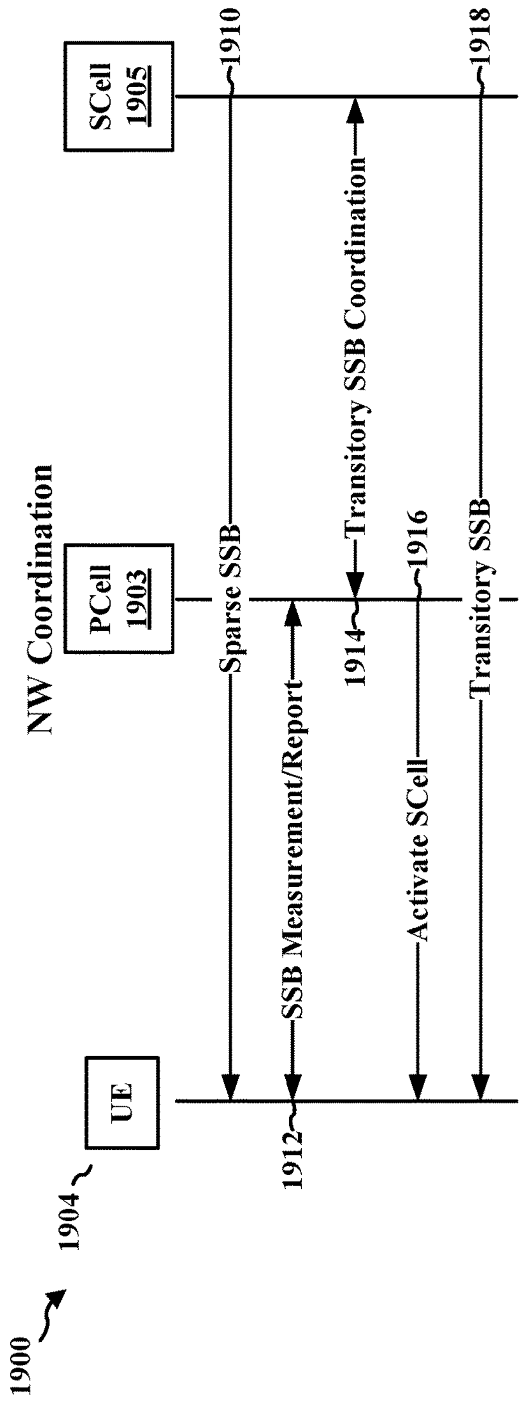



FIG. 19A

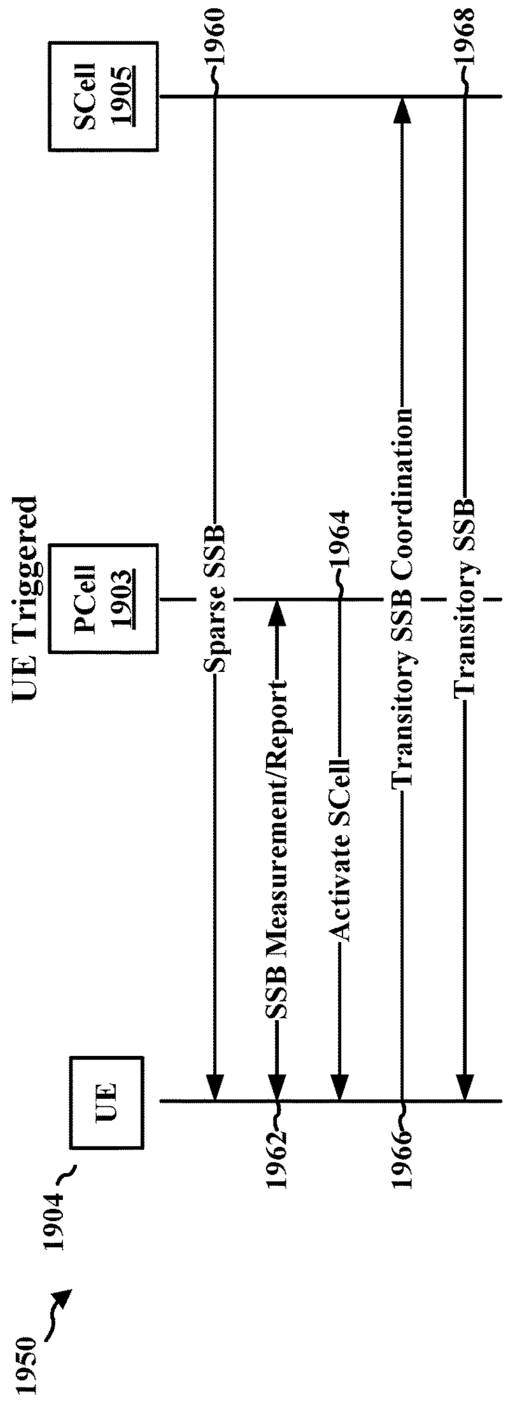



FIG. 19B

# SSB TRANSMISSION FOR TRANSITION PERIOD FOR SCELL OPERATION

## TECHNICAL FIELD

**[0001]** The present disclosure relates generally to communication systems, and more particularly, to wireless communication associated with an activation of a secondary cell.

## INTRODUCTION

**[0002]** Wireless communication systems are widely deployed to provide various telecommunication services such as telephony, video, data, messaging, and broadcasts. Typical wireless communication systems may employ multiple-access technologies capable of supporting communication with multiple users by sharing available system resources. Examples of such multiple-access technologies include code division multiple access (CDMA) systems, time division multiple access (TDMA) systems, frequency division multiple access (FDMA) systems, orthogonal frequency division multiple access (OFDMA) systems, single-carrier frequency division multiple access (SC-FDMA) systems, and time division synchronous code division multiple access (TD-SCDMA) systems.

**[0003]** These multiple access technologies have been adopted in various telecommunication standards to provide a common protocol that enables different wireless devices to communicate on a municipal, national, regional, and even global level. An example telecommunication standard is 5G New Radio (NR). 5G NR is part of a continuous mobile broadband evolution promulgated by Third Generation Partnership Project (3GPP) to meet new requirements associated with latency, reliability, security, scalability (e.g., with Internet of Things (IoT)), and other requirements. 5G NR includes services associated with enhanced mobile broadband (eMBB), massive machine type communications (mMTC), and ultra-reliable low latency communications (URLLC). Some aspects of 5G NR may be based on the 4G Long Term Evolution (LTE) standard. There exists a need for further improvements in 5G NR technology. These improvements may also be applicable to other multi-access technologies and the telecommunication standards that employ these technologies.

## BRIEF SUMMARY

**[0004]** The following presents a simplified summary of one or more aspects in order to provide a basic understanding of such aspects. This summary is not an extensive overview of all contemplated aspects. This summary neither identifies key or critical elements of all aspects nor delineates the scope of any or all aspects. Its sole purpose is to present some concepts of one or more aspects in a simplified form as a prelude to the more detailed description that is presented later.

**[0005]** In an aspect of the disclosure, a method, a computer-readable medium, and an apparatus are provided. The apparatus may be a wireless device such as a user equipment (UE) configured to receive a configuration for synchronization signal blocks (SSBs) associated with a secondary cell (SCell) for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE and measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration.

**[0006]** In an aspect of the disclosure, a method, a computer-readable medium, and an apparatus are provided. The apparatus may be a network, network device, or network component configured to output a configuration for SSBs from a SCell associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a UE, and output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration.

**[0007]** To the accomplishment of the foregoing and related ends, the one or more aspects may include the features hereinafter fully described and particularly pointed out in the claims. The following description and the drawings set forth in detail certain illustrative features of the one or more aspects. These features are indicative, however, of but a few of the various ways in which the principles of various aspects may be employed.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0008]** FIG. **1** is a diagram illustrating an example of a wireless communications system and an access network.

**[0009]** FIG. **2**A is a diagram illustrating an example of a first frame, in accordance with various aspects of the present disclosure.

**[0010]** FIG. **2**B is a diagram illustrating an example of downlink (DL) channels within a subframe, in accordance with various aspects of the present disclosure.

**[0011]** FIG. **2**C is a diagram illustrating an example of a second frame, in accordance with various aspects of the present disclosure.

**[0012]** FIG. **2**D is a diagram illustrating an example of uplink (UL) channels within a subframe, in accordance with various aspects of the present disclosure.

**[0013]** FIG. **3** is a diagram illustrating an example of a base station and UE in an access network.

**[0014]** FIG. **4** is a first diagram illustrating locations within a slot for SSBs associated with a first subcarrier spacing (SCS) and a second diagram illustrating different locations (and/or location patterns) within a slot for SSBs associated with a second SCS.

**[0015]** FIG. **5** is a diagram illustrating a transition from a deactivated state of an SCell to an activated state of the SCell associated with a first periodicity of an SSB burst (or SSB burst set).

**[0016]** FIG. **6** is a set of diagrams illustrating some aspects of an SCell activation.

**[0017]** FIG. **7** is a diagram illustrating an alternative method of reducing a time for SCell activation that does not rely on measurements made for a deactivated SCell.

**[0018]** FIG. **8**A is a time diagram illustrating example aspects of SSB burst transmissions during a transition period in response to an activation of an SCell in accordance with some aspects of the disclosure.

**[0019]** FIG. **8**B is a diagram illustrating a configuration of an SSB burst set during a transition time in accordance with some aspects of the disclosure.

**[0020]** FIG. **9** is a diagram illustrating a discontinuous transmission/discontinuous reception DTX/DRX mode of operation at a UE in accordance with some aspects of the disclosure.

**[0021]** FIG. **10** is a diagram illustrating possible configurations for a transitory SSB burst set and/or a periodic SSB burst set in accordance with some aspects of the disclosure.

**[0022]** FIG. **11** is a call flow diagram illustrating a method of configuring and/or triggering a transitory SSB burst set and/or a periodic SSB set in accordance with some aspects of the disclosure.

**[0023]** FIG. **12** is a flowchart of a method of wireless communication.

**[0024]** FIG. **13** is a flowchart of a method of wireless communication.

**[0025]** FIG. **14** is a flowchart of a method of wireless communication.

**[0026]** FIG. **15** is a flowchart of a method of wireless communication.

**[0027]** FIG. **16** is a diagram illustrating an example of a hardware implementation for an example apparatus and/or network entity.

**[0028]** FIG. **17** is a diagram illustrating an example of a hardware implementation for an example network entity.

**[0029]** FIG. **18** is a diagram illustrating an example of a hardware implementation for an example network entity.

**[0030]** FIG. **19**A is a call flow diagram illustrating a network-based coordination of a transitory SSB burst set in accordance with some aspects of the disclosure.

**[0031]** FIG. **19**B is a call flow diagram illustrating a UE-based coordination of a transitory SSB burst set in accordance with some aspects of the disclosure.

## DETAILED DESCRIPTION

**[0032]** In some aspects of wireless communication, a wireless device (e.g., a UE) may be capable of communicating with multiple cells. For example, a UE may receive a configuration for carrier aggregation involving multiple cells, e.g., including a primary cell (PCell) and one or more SCells. A PCell may, accordingly, activate one or more SCells for the UE. As a part of activation of the one or more SCells, in some aspects, the UE may monitor for (and measure) one or more SSBs (e.g., monitoring for SSBs in SSB bursts or SSB opportunities). For example, the UE may measure SSBs transmitted by the SCell that is in a different frequency band than the PCell or that is not collocated with the PCell. In some aspects, the SCell may transmit one or more SSBs with a first periodicity (e.g., 20-160 ms) configured for active operation of the SCell (after an initial cell search, or time and/or frequency tracking has completed). However, as part of the initial activation, the UE may use measurements of multiple SSB transmissions to successfully perform the cell search, automatic gain control (AGC), time and/or frequency tracking, layer 1 (L1) and/or layer 3 (L3) measurements, and other functions associated with cell activation. The activation latency may be large due the relatively long periods between SSB transmissions.

**[0033]** Various aspects relate generally to indicating a configuration of at least aperiodic (e.g., SSBs triggered by transition of the SCell) and/or periodic SSBs associated with a transition from a deactivated state of an SCell to an activated state of the SCell. Some aspects relate specifically to indicating the configuration via a medium access control (MAC) control element (CE) (MAC-CE) instead of via radio resource control (RRC) configuration to configure a set of SSBs associated with the transition from the deactivated state of an SCell to the activated state of the SCell. In some examples, a UE may be configured to receive a configuration for SSBs associated with an SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE and measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. In some aspects, a network (e.g., a PCell, a primary SCell (PSCell), or an activated SCell) may be configured to output a configuration for SSBs from a SCell associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a UE, and output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration.

**[0034]** Particular aspects of the subject matter described in this disclosure can be implemented to realize one or more of the following potential advantages. In some examples, by configuring a set of SSBs associated with a transition from a deactivated state of an SCell to an activated state of the SCell, the described techniques can be used to reduce a latency associated with the transition and/or the activation of the SCell by enabling the UE to make SSB measurements for SCell activation more quickly. For example, the set of SSBs associated with the transition may have a more compact configuration in time, which may enable the UE to measure a higher number of SSBs from the newly activated SCell more quickly and reduce latency for activation of the SCell.

**[0035]** The detailed description set forth below in connection with the drawings describes various configurations and does not represent the only configurations in which the concepts described herein may be practiced. The detailed description includes specific details for the purpose of providing a thorough understanding of various concepts. However, these concepts may be practiced without these specific details. In some instances, well known structures and components are shown in block diagram form in order to avoid obscuring such concepts.

**[0036]** Several aspects of telecommunication systems are presented with reference to various apparatus and methods. These apparatus and methods are described in the following detailed description and illustrated in the accompanying drawings by various blocks, components, circuits, processes, algorithms, etc. (collectively referred to as "elements"). These elements may be implemented using electronic hardware, computer software, or any combination thereof. Whether such elements are implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system.

**[0037]** By way of example, an element, or any portion of an element, or any combination of elements may be implemented as a "processing system" that includes one or more processors. When multiple processors are implemented, the multiple processors may perform the functions individually or in combination. Examples of processors include microprocessors, microcontrollers, graphics processing units (GPUs), central processing units (CPUs), application processors, digital signal processors (DSPs), reduced instruction set computing (RISC) processors, systems on a chip (SoC), baseband processors, field programmable gate arrays (FPGAs), programmable logic devices (PLDs), state machines, gated logic, discrete hardware circuits, and other suitable hardware configured to perform the various functionality described throughout this disclosure. One or more processors in the processing system may execute software. Software, whether referred to as software, firmware, middleware, microcode, hardware description language, or otherwise, shall be construed broadly to mean instructions, instruction sets, code, code segments, program code, programs, subprograms, software components, applications, software applications, software packages, routines, subroutines, objects, executables, threads of execution, procedures, functions, or any combination thereof.

**[0038]** Accordingly, in one or more example aspects, implementations, and/or use cases, the functions described may be implemented in hardware, software, or any combination thereof. If implemented in software, the functions may be stored on or encoded as one or more instructions or code on a computer-readable medium. Computer-readable media includes computer storage media. Storage media may be any available media that can be accessed by a computer. By way of example, such computer-readable media can include a random-access memory (RAM), a read-only memory (ROM), an electrically erasable programmable ROM (EEPROM), optical disk storage, magnetic disk storage, other magnetic storage devices, combinations of the types of computer-readable media, or any other medium that can be used to store computer executable code in the form of instructions or data structures that can be accessed by a computer.

**[0039]** While aspects, implementations, and/or use cases are described in this application by illustration to some examples, additional or different aspects, implementations and/or use cases may come about in many different arrangements and scenarios. Aspects, implementations, and/or use cases described herein may be implemented across many differing platform types, devices, systems, shapes, sizes, and packaging arrangements. For example, aspects, implementations, and/or use cases may come about via integrated chip implementations and other non-module-component based devices (e.g., end-user devices, vehicles, communication devices, computing devices, industrial equipment, retail/purchasing devices, medical devices, artificial intelligence (AI)-enabled devices, etc.). While some examples may or may not be specifically directed to use cases or applications, a wide assortment of applicability of described examples may occur. Aspects, implementations, and/or use cases may range a spectrum from chip-level or modular components to non-modular, non-chip-level implementations and further to aggregate, distributed, or original equipment manufacturer (OEM) devices or systems incorporating one or more techniques herein. In some practical settings, devices incorporating described aspects and features may also include additional components and features for implementation and practice of claimed and described aspect. For example, transmission and reception of wireless signals necessarily includes a number of components for analog and digital purposes (e.g., hardware components including antenna, RF-chains, power amplifiers, modulators, buffer, processor (s), interleaver, adders/summers, etc.). Techniques described herein may be practiced in a wide variety of devices, chip-level components, systems, distributed arrangements, aggregated or disaggregated components, end-user devices, etc. of varying sizes, shapes, and constitution.

**[0040]** Deployment of communication systems, such as 5G NR systems, may be arranged in multiple manners with various components or constituent parts. In a 5G NR system, or network, a network node, a network entity, a mobility element of a network, a radio access network (RAN) node, a core network node, a network element, or a network equipment, such as a base station (BS), or one or more units (or one or more components) performing base station functionality, may be implemented in an aggregated or disaggregated architecture. For example, a BS (such as a Node B (NB), evolved NB (eNB), NR BS, 5G NB, access point (AP), a transmission reception point (TRP), or a cell, etc.) may be implemented as an aggregated base station (also known as a standalone BS or a monolithic BS) or a disaggregated base station.

**[0041]** An aggregated base station may be configured to utilize a radio protocol stack that is physically or logically integrated within a single RAN node. A disaggregated base station may be configured to utilize a protocol stack that is physically or logically distributed among two or more units (such as one or more central or centralized units (CUs), one or more distributed units (DUs), or one or more radio units (RUs)). In some aspects, a CU may be implemented within a RAN node, and one or more DUs may be co-located with the CU, or alternatively, may be geographically or virtually distributed throughout one or multiple other RAN nodes. The DUs may be implemented to communicate with one or more RUs. Each of the CU, DU and RU can be implemented as virtual units, i.e., a virtual central unit (VCU), a virtual distributed unit (VDU), or a virtual radio unit (VRU).

**[0042]** Base station operation or network design may consider aggregation characteristics of base station functionality. For example, disaggregated base stations may be utilized in an integrated access backhaul (IAB) network, an open radio access network (O-RAN (such as the network configuration sponsored by the O-RAN Alliance)), or a virtualized radio access network (vRAN, also known as a cloud radio access network (C-RAN)). Disaggregation may include distributing functionality across two or more units at various physical locations, as well as distributing functionality for at least one unit virtually, which can enable flexibility in network design. The various units of the disaggregated base station, or disaggregated RAN architecture, can be configured for wired or wireless communication with at least one other unit.

**[0043]** FIG. **1** is a diagram **100** illustrating an example of a wireless communications system and an access network. The illustrated wireless communications system includes a disaggregated base station architecture. The disaggregated base station architecture may include one or more CUs **110** that can communicate directly with a core network **120** via a backhaul link, or indirectly with the core network **120** through one or more disaggregated base station units (such as a Near-Real Time (Near-RT) RAN Intelligent Controller (RIC) **125** via an E2 link, or a Non-Real Time (Non-RT) RIC **115** associated with a Service Management and Orchestration (SMO) Framework **105**, or both). A CU **110** may communicate with one or more DUs **130** via respective midhaul links, such as an F1 interface. The DUs **130** may communicate with one or more RUs **140** via respective fronthaul links. The RUs **140** may communicate with respective UEs **104** via one or more radio frequency (RF) access links. In some implementations, the UE **104** may be simultaneously served by multiple RUs **140**.

**[0044]** Each of the units, i.e., the CUs **110**, the DUs **130**, the RUs **140**, as well as the Near-RT RICs **125**, the Non-RT RICs **115**, and the SMO Framework **105**, may include one or more interfaces or be coupled to one or more interfaces configured to receive or to transmit signals, data, or information (collectively, signals) via a wired or wireless transmission medium. Each of the units, or an associated processor or controller providing instructions to the communication interfaces of the units, can be configured to communicate with one or more of the other units via the transmission medium. For example, the units can include a wired interface configured to receive or to transmit signals over a wired transmission medium to one or more of the other units. Additionally, the units can include a wireless interface, which may include a receiver, a transmitter, or a transceiver (such as an RF transceiver), configured to receive or to transmit signals, or both, over a wireless transmission medium to one or more of the other units.

**[0045]** In some aspects, the CU **110** may host one or more higher layer control functions. Such control functions can include radio resource control (RRC), packet data convergence protocol (PDCP), service data adaptation protocol (SDAP), or the like. Each control function can be implemented with an interface configured to communicate signals with other control functions hosted by the CU **110**. The CU **110** may be configured to handle user plane functionality (i.e., Central Unit-User Plane (CU-UP)), control plane functionality (i.e., Central Unit-Control Plane (CU-CP)), or a combination thereof. In some implementations, the CU **110** can be logically split into one or more CU-UP units and one or more CU-CP units. The CU-UP unit can communicate bidirectionally with the CU-CP unit via an interface, such as an E1 interface when implemented in an O-RAN configuration. The CU **110** can be implemented to communicate with the DU **130**, as necessary, for network control and signaling.

**[0046]** The DU **130** may correspond to a logical unit that includes one or more base station functions to control the operation of one or more RUs **140**. In some aspects, the DU **130** may host one or more of a radio link control (RLC) layer, a medium access control (MAC) layer, and one or more high physical (PHY) layers (such as modules for forward error correction (FEC) encoding and decoding, scrambling, modulation, demodulation, or the like) depending, at least in part, on a functional split, such as those defined by 3GPP. In some aspects, the DU **130** may further host one or more low PHY layers. Each layer (or module) can be implemented with an interface configured to communicate signals with other layers (and modules) hosted by the DU **130**, or with the control functions hosted by the CU **110**.

**[0047]** Lower-layer functionality can be implemented by one or more RUs **140**. In some deployments, an RU **140**, controlled by a DU **130**, may correspond to a logical node that hosts RF processing functions, or low-PHY layer functions (such as performing fast Fourier transform (FFT), inverse FFT (iFFT), digital beamforming, physical random access channel (PRACH) extraction and filtering, or the like), or both, based at least in part on the functional split, such as a lower layer functional split. In such an architecture, the RU(s) **140** can be implemented to handle over the air (OTA) communication with one or more UEs **104**. In some implementations, real-time and non-real-time aspects of control and user plane communication with the RU(s) **140** can be controlled by the corresponding DU **130**. In some scenarios, this configuration can enable the DU(s) **130** and the CU **110** to be implemented in a cloud-based RAN architecture, such as a vRAN architecture.

**[0048]** The SMO Framework **105** may be configured to support RAN deployment and provisioning of non-virtualized and virtualized network elements. For non-virtualized network elements, the SMO Framework **105** may be configured to support the deployment of dedicated physical resources for RAN coverage requirements that may be managed via an operations and maintenance interface (such as an O1 interface). For virtualized network elements, the SMO Framework **105** may be configured to interact with a cloud computing platform (such as an open cloud (O-Cloud) **190**) to perform network element life cycle management (such as to instantiate virtualized network elements) via a cloud computing platform interface (such as an O2 interface). Such virtualized network elements can include, but are not limited to, CUs **110**, DUs **130**, RUs **140** and Near-RT RICs **125**. In some implementations, the SMO Framework **105** can communicate with a hardware aspect of a 4G RAN, such as an open eNB (O-eNB) **111**, via an O1 interface. Additionally, in some implementations, the SMO Framework **105** can communicate directly with one or more RUs **140** via an O1 interface. The SMO Framework **105** also may include a Non-RT RIC **115** configured to support functionality of the SMO Framework **105**.

**[0049]** The Non-RT RIC **115** may be configured to include a logical function that enables non-real-time control and optimization of RAN elements and resources, artificial intelligence (AI)/machine learning (ML) (AI/ML) workflows including model training and updates, or policy-based guidance of applications/features in the Near-RT RIC **125**. The Non-RT RIC **115** may be coupled to or communicate with (such as via an AI interface) the Near-RT RIC **125**. The Near-RT RIC **125** may be configured to include a logical function that enables near-real-time control and optimization of RAN elements and resources via data collection and actions over an interface (such as via an E2 interface) connecting one or more CUs **110**, one or more DUs **130**, or both, as well as an O-eNB, with the Near-RT RIC **125**.

**[0050]** In some implementations, to generate AI/ML models to be deployed in the Near-RT RIC **125**, the Non-RT RIC **115** may receive parameters or external enrichment information from external servers. Such information may be utilized by the Near-RT RIC **125** and may be received at the SMO Framework **105** or the Non-RT RIC **115** from non-network data sources or from network functions. In some examples, the Non-RT RIC **115** or the Near-RT RIC **125** may be configured to tune RAN behavior or performance. For example, the Non-RT RIC **115** may monitor long-term trends and patterns for performance and employ AI/ML models to perform corrective actions through the SMO Framework **105** (such as reconfiguration via **01**) or via creation of RAN management policies (such as AI policies).

**[0051]** At least one of the CU **110**, the DU **130**, and the RU **140** may be referred to as a base station **102**. Accordingly, a base station **102** may include one or more of the CU **110**, the DU **130**, and the RU **140** (each component indicated with dotted lines to signify that each component may or may not be included in the base station **102**). The base station **102** provides an access point to the core network **120** for a UE **104**. The base station **102** may include macrocells (high power cellular base station) and/or small cells (low power cellular base station). The small cells include femtocells, picocells, and microcells. A network that includes both small cell and macrocells may be known as a heterogeneous network. A heterogeneous network may also include Home Evolved Node Bs (eNBs) (HeNBs), which may provide service to a restricted group known as a closed subscriber group (CSG). The communication links between the RUs **140** and the UEs **104** may include uplink (UL) (also referred to as reverse link) transmissions from a UE **104** to an RU **140** and/or downlink (DL) (also referred to as forward link) transmissions from an RU **140** to a UE **104**. The communication links may use multiple-input and multiple-output (MIMO) antenna technology, including spatial multiplexing, beamforming, and/or transmit diversity. The communication links may be through one or more carriers. The base station **102**/UEs **104** may use spectrum up to Y MHz (e.g., 5, 10, 15, 20, 100, 400, etc. MHz) bandwidth per carrier allocated in a carrier aggregation of up to a total of Yx MHz (x component carriers) used for transmission in each direction. The carriers may or may not be adjacent to each other. Allocation of carriers may be asymmetric with respect to DL and UL (e.g., more or fewer carriers may be allocated for DL than for UL). The component carriers may include a primary component carrier and one or more secondary component carriers. A primary component carrier may be referred to as a primary cell (PCell) and a secondary component carrier may be referred to as a secondary cell (SCell).

**[0052]** Certain UEs **104** may communicate with each other using device-to-device (D2D) communication link **158**. The D2D communication link **158** may use the DL/UL wireless wide area network (WWAN) spectrum. The D2D communication link **158** may use one or more sidelink channels, such as a physical sidelink broadcast channel (PSBCH), a physical sidelink discovery channel (PSDCH), a physical sidelink shared channel (PSSCH), and a physical sidelink control channel (PSCCH). D2D communication may be through a variety of wireless D2D communications systems, such as for example, Bluetooth™ (Bluetooth is a trademark of the Bluetooth Special Interest Group (SIG)), Wi-Fi™ (Wi-Fi is a trademark of the Wi-Fi Alliance) based on the Institute of Electrical and Electronics Engineers (IEEE) 802.11 standard, LTE, or NR.

**[0053]** The wireless communications system may further include a Wi-Fi AP **150** in communication with UEs **104** (also referred to as Wi-Fi stations (STAs)) via communication link **154**, e.g., in a 5 GHz unlicensed frequency spectrum or the like. When communicating in an unlicensed frequency spectrum, the UEs **104**/AP **150** may perform a clear channel assessment (CCA) prior to communicating in order to determine whether the channel is available.

**[0054]** The electromagnetic spectrum is often subdivided, based on frequency/wavelength, into various classes, bands, channels, etc. In 5G NR, two initial operating bands have been identified as frequency range designations FR1 (410 MHz-7.125 GHz) and FR2 (24.25 GHz-52.6 GHz). Although a portion of FR1 is greater than 6 GHz, FR1 is often referred to (interchangeably) as a "sub-6 GHz" band in various documents and articles. A similar nomenclature issue sometimes occurs with regard to FR2, which is often referred to (interchangeably) as a "millimeter wave" band in documents and articles, despite being different from the extremely high frequency (EHF) band (30 GHz-300 GHz) which is identified by the International Telecommunications Union (ITU) as a "millimeter wave" band.

**[0055]** The frequencies between FR1 and FR2 are often referred to as mid-band frequencies. Recent 5G NR studies have identified an operating band for these mid-band frequencies as frequency range designation FR3 (7.125 GHz-24.25 GHz). Frequency bands falling within FR3 may inherit FR1 characteristics and/or FR2 characteristics, and thus may effectively extend features of FR1 and/or FR2 into mid-band frequencies. In addition, higher frequency bands are currently being explored to extend 5G NR operation beyond 52.6 GHz. For example, three higher operating bands have been identified as frequency range designations FR2-2 (52.6 GHz-71 GHz), FR4 (71 GHz-114.25 GHz), and FR5 (114.25 GHz-300 GHz). Each of these higher frequency bands falls within the EHF band.

**[0056]** With the above aspects in mind, unless specifically stated otherwise, the term "sub-6 GHz" or the like if used herein may broadly represent frequencies that may be less than 6 GHz, may be within FR1, or may include mid-band frequencies. Further, unless specifically stated otherwise, the term "millimeter wave" or the like if used herein may broadly represent frequencies that may include mid-band frequencies, may be within FR2, FR4, FR2-2, and/or FR5, or may be within the EHF band.

**[0057]** The base station **102** and the UE **104** may each include a plurality of antennas, such as antenna elements, antenna panels, and/or antenna arrays to facilitate beamforming. The base station **102** may transmit a beamformed signal **182** to the UE **104** in one or more transmit directions. The UE **104** may receive the beamformed signal from the base station **102** in one or more receive directions. The UE **104** may also transmit a beamformed signal **184** to the base station **102** in one or more transmit directions. The base station **102** may receive the beamformed signal from the UE **104** in one or more receive directions. The base station **102**/UE **104** may perform beam training to determine the best receive and transmit directions for each of the base station **102**/UE **104**. The transmit and receive directions for the base station **102** may or may not be the same. The transmit and receive directions for the UE **104** may or may not be the same.

**[0058]** The base station **102** may include and/or be referred to as a gNB, Node B, eNB, an access point, a base transceiver station, a radio base station, a radio transceiver, a transceiver function, a basic service set (BSS), an extended service set (ESS), a TRP, network node, network entity, network equipment, or some other suitable terminology. The base station **102** can be implemented as an integrated access and backhaul (IAB) node, a relay node, a sidelink node, an aggregated (monolithic) base station with a baseband unit (BBU) (including a CU and a DU) and an RU, or as a disaggregated base station including one or more of a CU, a DU, and/or an RU. The set of base stations, which may include disaggregated base stations and/or aggregated base stations, may be referred to as next generation (NG) RAN (NG-RAN).

**[0059]** The core network **120** may include an Access and Mobility Management Function (AMF) **161**, a Session Management Function (SMF) **162**, a User Plane Function (UPF) **163**, a Unified Data Management (UDM) **164**, one or more location servers **168**, and other functional entities. The AMF **161** is the control node that processes the signaling between the UEs **104** and the core network **120**. The AMF **161** supports registration management, connection management, mobility management, and other functions. The SMF **162** supports session management and other functions. The UPF **163** supports packet routing, packet forwarding, and other functions. The UDM **164** supports the generation of authentication and key agreement (AKA) credentials, user identification handling, access authorization, and subscription management. The one or more location servers **168** are illustrated as including a Gateway Mobile Location Center (GMLC) **165** and a Location Management Function (LMF)

**166**. However, generally, the one or more location servers **168** may include one or more location/positioning servers, which may include one or more of the GMLC **165**, the LMF **166**, a position determination entity (PDE), a serving mobile location center (SMLC), a mobile positioning center (MPC), or the like. The GMLC **165** and the LMF **166** support UE location services. The GMLC **165** provides an interface for clients/applications (e.g., emergency services) for accessing UE positioning information. The LMF **166** receives measurements and assistance information from the NG-RAN and the UE **104** via the AMF **161** to compute the position of the UE **104**. The NG-RAN may utilize one or more positioning methods in order to determine the position of the UE **104**. Positioning the UE **104** may involve signal measurements, a position estimate, and an optional velocity computation based on the measurements. The signal measurements may be made by the UE **104** and/or the base station **102** serving the UE **104**. The signals measured may be based on one or more of a satellite positioning system **170** (e.g., one or more of a Global Navigation Satellite System (GNSS), global position system (GPS), non-terrestrial network (NTN), or other satellite position/location system), LTE signals, wireless local area network (WLAN) signals, Bluetooth signals, a terrestrial beacon system (TBS), sensor-based information (e.g., barometric pressure sensor, motion sensor), NR enhanced cell ID (NR E-CID) methods, NR signals (e.g., multi-round trip time (Multi-RTT), DL angle-of-departure (DL-AoD), DL time difference of arrival (DL-TDOA), UL time difference of arrival (UL-TDOA), and UL angle-of-arrival (UL-AoA) positioning), and/or other systems/signals/sensors.

**[0060]** Examples of UEs **104** include a cellular phone, a smart phone, a session initiation protocol (SIP) phone, a laptop, a personal digital assistant (PDA), a satellite radio, a global positioning system, a multimedia device, a video device, a digital audio player (e.g., MP3 player), a camera, a game console, a tablet, a smart device, a wearable device, a vehicle, an electric meter, a gas pump, a large or small kitchen appliance, a healthcare device, an implant, a sensor/actuator, a display, or any other similar functioning device. Some of the UEs **104** may be referred to as IoT devices (e.g., parking meter, gas pump, toaster, vehicles, heart monitor, etc.). The UE **104** may also be referred to as a station, a mobile station, a subscriber station, a mobile unit, a subscriber unit, a wireless unit, a remote unit, a mobile device, a wireless device, a wireless communications device, a remote device, a mobile subscriber station, an access terminal, a mobile terminal, a wireless terminal, a remote terminal, a handset, a user agent, a mobile client, a client, or some other suitable terminology. In some scenarios, the term UE may also apply to one or more companion devices such as in a device constellation arrangement. One or more of these devices may collectively access the network and/or individually access the network.

**[0061]** Referring again to FIG. **1**, in certain aspects, the UE **104** may have an aperiodic SSB configuration component **198** that may be configured to receive a configuration for SSBs associated with a SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE and measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. In certain aspects, the base station **102** may have an aperiodic SSB configuration component **199** that may be configured to output a configuration for SSBs from a SCell associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a UE, and output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. Although the following description may be focused on 5G NR, the concepts described herein may be applicable to other similar areas, such as LTE, LTE-A, CDMA, GSM, and other wireless technologies.

**[0062]** FIG. **2**A is a diagram **200** illustrating an example of a first subframe within a 5G NR frame structure. FIG. **2**B is a diagram **230** illustrating an example of DL channels within a 5G NR subframe. FIG. **2**C is a diagram **250** illustrating an example of a second subframe within a 5G NR frame structure. FIG. **2**D is a diagram **280** illustrating an example of UL channels within a 5G NR subframe. The 5G NR frame structure may be frequency division duplexed (FDD) in which for a particular set of subcarriers (carrier system bandwidth), subframes within the set of subcarriers are dedicated for either DL or UL, or may be time division duplexed (TDD) in which for a particular set of subcarriers (carrier system bandwidth), subframes within the set of subcarriers are dedicated for both DL and UL. In the examples provided by FIGS. **2**A, **2**C, the 5G NR frame structure is assumed to be TDD, with subframe 4 being configured with slot format 28 (with mostly DL), where D is DL, U is UL, and F is flexible for use between DL/UL, and subframe 3 being configured with slot format 1 (with all UL). While subframes 3, 4 are shown with slot formats 1, 28, respectively, any particular subframe may be configured with any of the various available slot formats 0-61. Slot formats 0, 1 are all DL, UL, respectively. Other slot formats 2-61 include a mix of DL, UL, and flexible symbols. UEs are configured with the slot format (dynamically through DL control information (DCI), or semi-statically/statically through radio resource control (RRC) signaling) through a received slot format indicator (SFI). Note that the description infra applies also to a 5G NR frame structure that is TDD.

**[0063]** FIGS. **2**A-**2**D illustrate a frame structure, and the aspects of the present disclosure may be applicable to other wireless communication technologies, which may have a different frame structure and/or different channels. A frame (10 ms) may be divided into 10 equally sized subframes (1 ms). Each subframe may include one or more time slots. Subframes may also include mini-slots, which may include 7, 4, or 2 symbols. Each slot may include 14 or 12 symbols, depending on whether the cyclic prefix (CP) is normal or extended. For normal CP, each slot may include 14 symbols, and for extended CP, each slot may include 12 symbols. The symbols on DL may be CP orthogonal frequency division multiplexing (OFDM) (CP-OFDM) symbols. The symbols on UL may be CP-OFDM symbols (for high throughput scenarios) or discrete Fourier transform (DFT) spread OFDM (DFT-s-OFDM) symbols (for power limited scenarios; limited to a single stream transmission). The number of slots within a subframe is based on the CP and the numerology. The numerology defines the subcarrier spacing (SCS) (see Table 1). The symbol length/duration may scale with 1/SCS.

TABLE 1

| Numerology, SCS, and CP | | |
|---|---|---|
| $\mu$ | SCS $\Delta f = 2^{\mu} \cdot 15$[kHz] | Cyclic prefix |
| 0 | 15 | Normal |
| 1 | 30 | Normal |
| 2 | 60 | Normal, Extended |
| 3 | 120 | Normal |
| 4 | 240 | Normal |
| 5 | 480 | Normal |
| 6 | 960 | Normal |

**[0064]** For normal CP (14 symbols/slot), different numerologies $\mu$ 0 to 4 allow for 1, 2, 4, 8, and 16 slots, respectively, per subframe. For extended CP, the numerology 2 allows for 4 slots per subframe. Accordingly, for normal CP and numerology $\mu$, there are 14 symbols/slot and 2 slots/subframe. The subcarrier spacing may be equal to $2^{\mu}*15$ kHz, where $\mu$ is the numerology 0 to 4. As such, the numerology $\mu$=0 has a subcarrier spacing of 15 kHz and the numerology $\mu$=4 has a subcarrier spacing of 240 kHz. The symbol length/duration is inversely related to the subcarrier spacing. FIGS. **2**A-**2**D provide an example of normal CP with 14 symbols per slot and numerology $\mu$=2 with 4 slots per subframe. The slot duration is 0.25 ms, the subcarrier spacing is 60 kHz, and the symbol duration is approximately 16.67 s. Within a set of frames, there may be one or more different bandwidth parts (BWPs) (see FIG. **2**B) that are frequency division multiplexed. Each BWP may have a particular numerology and CP (normal or extended).

**[0065]** A resource grid may be used to represent the frame structure. Each time slot includes a resource block (RB) (also referred to as physical RBs (PRBs)) that extends 12 consecutive subcarriers. The resource grid is divided into multiple resource elements (REs). The number of bits carried by each RE depends on the modulation scheme.

**[0066]** As illustrated in FIG. **2**A, some of the REs carry reference (pilot) signals (RS) for the UE. The RS may include demodulation RS (DM-RS) (indicated as R for one particular configuration, but other DM-RS configurations are possible) and channel state information reference signals (CSI-RS) for channel estimation at the UE. The RS may also include beam measurement RS (BRS), beam refinement RS (BRRS), and phase tracking RS (PT-RS).

**[0067]** FIG. **2**B illustrates an example of various DL channels within a subframe of a frame. The physical downlink control channel (PDCCH) carries DCI within one or more control channel elements (CCEs) (e.g., 1, 2, 4, 8, or 16 CCEs), each CCE including six RE groups (REGs), each REG including 12 consecutive REs in an OFDM symbol of an RB. A PDCCH within one BWP may be referred to as a control resource set (CORESET). A UE is configured to monitor PDCCH candidates in a PDCCH search space (e.g., common search space, UE-specific search space) during PDCCH monitoring occasions on the CORESET, where the PDCCH candidates have different DCI formats and different aggregation levels. Additional BWPs may be located at greater and/or lower frequencies across the channel bandwidth. A primary synchronization signal (PSS) may be within symbol 2 of particular subframes of a frame. The PSS is used by a UE **104** to determine subframe/symbol timing and a physical layer identity. A secondary synchronization signal (SSS) may be within symbol 4 of particular subframes of a frame. The SSS is used by a UE to determine a physical layer cell identity group number and radio frame timing. Based on the physical layer identity and the physical layer cell identity group number, the UE can determine a physical cell identifier (PCI). Based on the PCI, the UE can determine the locations of the DM-RS. The physical broadcast channel (PBCH), which carries a master information block (MIB), may be logically grouped with the PSS and SSS to form a synchronization signal (SS)/PBCH block (also referred to as SS block (SSB)). The MIB provides a number of RBs in the system bandwidth and a system frame number (SFN). The physical downlink shared channel (PDSCH) carries user data, broadcast system information not transmitted through the PBCH such as system information blocks (SIBs), and paging messages.

**[0068]** As illustrated in FIG. **2**C, some of the REs carry DM-RS (indicated as R for one particular configuration, but other DM-RS configurations are possible) for channel estimation at the base station. The UE may transmit DM-RS for the physical uplink control channel (PUCCH) and DM-RS for the physical uplink shared channel (PUSCH). The PUSCH DM-RS may be transmitted in the first one or two symbols of the PUSCH. The PUCCH DM-RS may be transmitted in different configurations depending on whether short or long PUCCHs are transmitted and depending on the particular PUCCH format used. The UE may transmit sounding reference signals (SRS). The SRS may be transmitted in the last symbol of a subframe. The SRS may have a comb structure, and a UE may transmit SRS on one of the combs. The SRS may be used by a base station for channel quality estimation to enable frequency-dependent scheduling on the UL.

**[0069]** FIG. **2**D illustrates an example of various UL channels within a subframe of a frame. The PUCCH may be located as indicated in one configuration. The PUCCH carries uplink control information (UCI), such as scheduling requests, a channel quality indicator (CQI), a precoding matrix indicator (PMI), a rank indicator (RI), and hybrid automatic repeat request (HARQ) acknowledgment (ACK) (HARQ-ACK) feedback (i.e., one or more HARQ ACK bits indicating one or more ACK and/or negative ACK (NACK)). The PUSCH carries data, and may additionally be used to carry a buffer status report (BSR), a power headroom report (PHR), and/or UCI.

**[0070]** FIG. **3** is a block diagram of a base station **310** in communication with a UE **350** in an access network. In the DL, Internet protocol (IP) packets may be provided to a controller/processor **375**. The controller/processor **375** implements layer 3 and layer 2 functionality. Layer 3 includes a radio resource control (RRC) layer, and layer 2 includes a service data adaptation protocol (SDAP) layer, a packet data convergence protocol (PDCP) layer, a radio link control (RLC) layer, and a medium access control (MAC) layer. The controller/processor **375** provides RRC layer functionality associated with broadcasting of system information (e.g., MIB, SIBs), RRC connection control (e.g., RRC connection paging, RRC connection establishment, RRC connection modification, and RRC connection release), inter radio access technology (RAT) mobility, and measurement configuration for UE measurement reporting; PDCP layer functionality associated with header compression/decompression, security (ciphering, deciphering, integrity protection, integrity verification), and handover support functions; RLC layer functionality associated with the transfer of upper layer packet data units (PDUs), error correction through ARQ, concatenation, segmentation, and reassembly of RLC service data units (SDUs), re-segmentation of RLC data PDUs, and reordering of RLC data PDUs; and MAC layer functionality associated with mapping between logical channels and transport channels, multiplexing of MAC SDUs onto transport blocks (TBs), demultiplexing of MAC SDUs from TBs, scheduling information reporting, error correction through HARQ, priority handling, and logical channel prioritization.

**[0071]** The transmit (TX) processor **316** and the receive (RX) processor **370** implement layer 1 functionality associated with various signal processing functions. Layer 1, which includes a physical (PHY) layer, may include error detection on the transport channels, forward error correction (FEC) coding/decoding of the transport channels, interleaving, rate matching, mapping onto physical channels, modulation/demodulation of physical channels, and MIMO antenna processing. The TX processor **316** handles mapping to signal constellations based on various modulation schemes (e.g., binary phase-shift keying (BPSK), quadrature phase-shift keying (QPSK), M-phase-shift keying (M-PSK), M-quadrature amplitude modulation (M-QAM)). The coded and modulated symbols may then be split into parallel streams. Each stream may then be mapped to an OFDM subcarrier, multiplexed with a reference signal (e.g., pilot) in the time and/or frequency domain, and then combined together using an Inverse Fast Fourier Transform (IFFT) to produce a physical channel carrying a time domain OFDM symbol stream. The OFDM stream is spatially precoded to produce multiple spatial streams. Channel estimates from a channel estimator **374** may be used to determine the coding and modulation scheme, as well as for spatial processing. The channel estimate may be derived from a reference signal and/or channel condition feedback transmitted by the UE **350**. Each spatial stream may then be provided to a different antenna **320** via a separate transmitter **318**Tx. Each transmitter **318**Tx may modulate a radio frequency (RF) carrier with a respective spatial stream for transmission.

**[0072]** At the UE **350**, each receiver **354**Rx receives a signal through its respective antenna **352**. Each receiver **354**Rx recovers information modulated onto an RF carrier and provides the information to the receive (RX) processor **356**. The TX processor **368** and the RX processor **356** implement layer 1 functionality associated with various signal processing functions. The RX processor **356** may perform spatial processing on the information to recover any spatial streams destined for the UE **350**. If multiple spatial streams are destined for the UE **350**, they may be combined by the RX processor **356** into a single OFDM symbol stream. The RX processor **356** then converts the OFDM symbol stream from the time-domain to the frequency domain using a Fast Fourier Transform (FFT). The frequency domain signal includes a separate OFDM symbol stream for each subcarrier of the OFDM signal. The symbols on each subcarrier, and the reference signal, are recovered and demodulated by determining the most likely signal constellation points transmitted by the base station **310**. These soft decisions may be based on channel estimates computed by the channel estimator **358**. The soft decisions are then decoded and deinterleaved to recover the data and control signals that were originally transmitted by the base station **310** on the physical channel. The data and control signals are then provided to the controller/processor **359**, which implements layer 3 and layer 2 functionality.

**[0073]** The controller/processor **359** can be associated with at least one memory **360** that stores program codes and data. The at least one memory **360** may be referred to as a computer-readable medium. In the UL, the controller/processor **359** provides demultiplexing between transport and logical channels, packet reassembly, deciphering, header decompression, and control signal processing to recover IP packets. The controller/processor **359** is also responsible for error detection using an ACK and/or NACK protocol to support HARQ operations.

**[0074]** Similar to the functionality described in connection with the DL transmission by the base station **310**, the controller/processor **359** provides RRC layer functionality associated with system information (e.g., MIB, SIBs) acquisition, RRC connections, and measurement reporting; PDCP layer functionality associated with header compression/decompression, and security (ciphering, deciphering, integrity protection, integrity verification); RLC layer functionality associated with the transfer of upper layer PDUs, error correction through ARQ, concatenation, segmentation, and reassembly of RLC SDUs, re-segmentation of RLC data PDUs, and reordering of RLC data PDUs; and MAC layer functionality associated with mapping between logical channels and transport channels, multiplexing of MAC SDUs onto TBs, demultiplexing of MAC SDUs from TBs, scheduling information reporting, error correction through HARQ, priority handling, and logical channel prioritization.

**[0075]** Channel estimates derived by a channel estimator **358** from a reference signal or feedback transmitted by the base station **310** may be used by the TX processor **368** to select the appropriate coding and modulation schemes, and to facilitate spatial processing. The spatial streams generated by the TX processor **368** may be provided to different antennas **352** via separate transmitters **354**Tx. Each transmitter **354**Tx may modulate an RF carrier with a respective spatial stream for transmission.

**[0076]** The UL transmission is processed at the base station **310** in a manner similar to that described in connection with the receiver function at the UE **350**. Each receiver **318**Rx receives a signal through its respective antenna **320**. Each receiver **318**Rx recovers information modulated onto an RF carrier and provides the information to a RX processor **370**.

**[0077]** The controller/processor **375** can be associated with at least one memory **376** that stores program codes and data. The at least one memory **376** may be referred to as a computer-readable medium. In the UL, the controller/processor **375** provides demultiplexing between transport and logical channels, packet reassembly, deciphering, header decompression, control signal processing to recover IP packets. The controller/processor **375** is also responsible for error detection using an ACK and/or NACK protocol to support HARQ operations.

**[0078]** At least one of the TX processor **368**, the RX processor **356**, and the controller/processor **359** may be configured to perform aspects in connection with the aperiodic SSB configuration component **198** of FIG. **1**.

**[0079]** At least one of the TX processor **316**, the RX processor **370**, and the controller/processor **375** may be configured to perform aspects in connection with the aperiodic SSB configuration component **199** of FIG. **1**.

[0080] In some aspects of wireless communication, a wireless device (e.g., a UE) may be capable of communicating with multiple cells. A PCell may activate, or signal to a UE an activation of, one or more SCells. When an SCell is activated for the UE, in some aspects, the UE may monitor for (and measure) one or more SSBs (in SSB bursts or SSB opportunities) from the SCell. In some aspects, the SCell may transmit the one or more SSBs with a first periodicity (e.g., 20-160 ms) configured for active operation of the SCell (e.g., after an initial cell search, or time and/or frequency tracking has completed). However, for the initial activation, the UE may measure multiple SSB transmissions to successfully perform the cell search and/or the time and/or frequency tracking. The activation latency of the SCell may be large due the relatively long period between SSB transmissions.

[0081] As described above in relation to the example of an SSB in FIG. **2**B, an SSB may include a PSS, an SSS and a PBCH. As an example, the SSB may include one symbol including a PSS, one symbol including an SSS, and 2 or more symbols including PBCH. FIG. **2**B illustrates that the PSS, SSS, and PBCH may be time division multiplexed (TDM) in consecutive symbols of the SSB. FIG. **2**B also shows that the PBCH may be frequency division multiplexed (FDM) with the SSB. A time domain mapping may include a PSS symbol, followed by a PBCH symbol, followed by a symbol including SSS and PBCH, followed by another PBCH symbol. Different frequency ranges may be associated with different possible SCS for an SSB. For example, for frequencies below 7 GHz, an SSB may be associated with one of a 15 kHz or 30 kHz SCS, while for frequencies above 7 GHz, an SSB may be associated with one of 120 kHz or 240 kHz SCS.

[0082] Sets of SSBs may be transmitted in SSB bursts. In some aspects, a transmission of SSBs within an SSB burst may be confined to a 5 ms half-frame. FIG. **4** is a first diagram **400** illustrating locations within a slot for SSBs associated with a first SCS and a second diagram **450** illustrating different locations (and/or location patterns) within a slot for SSBs associated with a second SCS.

[0083] Within an SSB burst, the maximum number of possible candidate SSB locations may be a value ("L") that depends on the carrier frequency. For example, for carrier frequencies up to 3 GHz, L may take the value 4; for carrier frequencies between 3 GHz and 7 GHz, L may take the value 8; and for carrier frequencies from 7 GHz to 52.6 GHz (or 7 GHz and above), L may take the value 64. Diagram **400** illustrates a pattern or distribution of SSB opportunities and/or SSB locations within a slot for a first SCS (e.g., 15 kHz SCS). As illustrated in diagram **400**, for a first SSB burst associated with 8 SSB opportunities/locations, there are four subframes and/or slots (where a slot and a subframe are each 1 ms for a 15 kHz SCS) that are candidates for including one or more SSBs (for a maximum of 8 SSB opportunities/locations per SSB burst). The four subframes and/or slots, in some aspects may span a first 4 ms within a first half-frame in a set of 4 half frames (e.g., a first 5 ms window in a 20 ms time period). Each of the four candidate slots may include 14 OFDM symbols of which symbols 2-5 are a first SSB opportunity/location and symbols 8-11 are a second SSB opportunity/location.

[0084] While the candidate subframes and/or slots are identified for an SSB burst including (or spanning) the maximum number of SSB opportunities/locations, in some aspects, each of the subframes and/or slots in the first 5 ms may be used (e.g., may be a candidate) to transmit an SSB burst comprising up to two SSB transmissions via the two SSB opportunities/locations in the subframe and/or slot. Similarly, a first two subframes and/or slots may be used to transmit a first SSB burst including up to four SSB transmissions via the four SSB opportunities/locations included in the two subframes and/or slots while a second SSB burst may follow in the next two subframes and/or slots (the third and fourth subframes and/or slots) or in two subframes and/or slots (the fourth and fifth subframes and/or slots) following a one-subframe period with no SSB transmissions.

[0085] Diagram **450** illustrates two possible patterns or distributions of SSB opportunities and/or SSB locations within a slot for a second SCS (e.g., 30 kHz SCS). As illustrated in diagram **450**, there are two subframes corresponding to four slots (where a slot is 0.5 ms and a subframe is 1 ms for a 30 kHz SCS) that are candidates for including one or more SSBs (for a maximum of 8 SSB opportunities/locations per SSB burst). The four slots, in some aspects may span a first 2 ms within a first half-frame in a set of 4 half frames (e.g., a first 5 ms window in a 20 ms time period). SSB opportunity/location pattern **460** illustrates that each of the four candidate slots may include 14 OFDM symbols and that in each pair of symbols a first slot may include symbols 4-7 as a first SSB opportunity/location and symbols 8-11 as a second SSB opportunity/location (where the duration and location in time of the first and second SSB opportunities/locations corresponds to the time and duration of the first SSB opportunity/location for a 15 kHz SCS). Similarly, the second slot may include symbols 2-6 as a third SSB opportunity/location and symbols 7-10 as a fourth SSB opportunity/location (where the duration and location in time of the third and fourth SSB opportunities/locations corresponds to the time and duration of the second SSB opportunity/location for a 15 kHz SCS). SSB opportunity/location pattern **470** illustrates that each of the four candidate slots may include 14 OFDM symbols of which symbols 2-5 are a first SSB opportunity/location and symbols 8-11 are a second SSB opportunity/location (where the pattern is similar to the pattern used for a 15 kHz SCS).

[0086] In some aspects, an SSB burst may be associated with a fixed number of adjacent SSB transmissions and may be associated with an indication of SSB opportunities/locations for which an SSB is transmitted. An SSB burst, in some aspects, may additionally be indicated to be part of an SSB burst set of similarly configured SSB bursts associated with a periodicity (or period) of the SSB bursts within the SSB burst set.

[0087] FIG. **5** is a diagram **500** illustrating a transition from a deactivated state of an SCell to an activated state of the SCell associated with a first periodicity of an SSB burst (or SSB burst set) that includes a plurality of SSBs. Each SSB of the plurality of SSBs may include a PSS, SSS, and/or PBCH, such as the example described in connection with FIG. **2**B. Diagram **500** illustrates that during a deactivated time period a periodic SSB burst **502** occasion may occur within a measurement time window (e.g., SMTC window **504**. In some aspects, each SSB burst (e.g., periodic SSB burst **502**) may be associated with one or more SSB opportunities/locations as described in relation to FIG. **4**. During the deactivated time period, a UE (and the SCell) may receive an activation command **506** from a network node indicating an activation of the SCell that initiates a transition from the deactivated state to an activated state. The UE may acknowledge the activation command **506** with ACK **508** and a transition period may occur between the activation command and a time at which the SCell is in the activated state. In some aspects, the transition period associated with the SCell activate may begin at a first time offset ($T_1$) from the ACK **508**. In order to transition to the activated state, the UE may measure SSB(s) in one or more SSB bursts (periodic SSB bursts with a configured periodicity) spanning an acquisition time ($T_2$) to successfully perform cell search and/or other functions associated with cell activation. As an example, the UE may use the measurements to perform automatic gain control (AGC), L1/L3 measurements, or time and/or frequency tracking, among other examples. While illustrated as two SSB bursts to illustrate the concept, in some aspects, the UE may measure SSBs of more than two SSB bursts before successfully performing operations associated with the cell activation. The measurement(s) may be followed by a processing time ($T_3$) based on the measured SSB bursts. After the processing time ($T_3$), the SCell may be activated, which may be referred to as initiating or entering an activated state. The SCell, in some aspects, may continue to transmit the periodic SSB bursts in the activated state (during an activated time).

**[0088]** As illustrated in diagram **500**, the period of the SSB bursts, in some aspects, may be consistent across the deactivated state, during the transition period, and during the activated state. In some aspects, the period of the SSB bursts may be modified (the period may be increased) or transmission of the SSB(s) in the SSB bursts may be skipped to conserve power during a deactivated time, while the SSB bursts may be transmitted with a common period (or periodicity) during a transition time and in an activated state. As an example, when the SCell is deactivated, the SCell may skip transmission of SSB(s) in the periodic SSB burst **502**. In some aspects, the SCell may transmit a subset of SSBs in the SSB burst **502** in the deactivated time period. The UE may skip monitoring for, or measurement of, the SSB(s) in the periodic SSB burst **502** while the SCell is deactivated.

**[0089]** FIG. **6** is a set of diagrams (diagram **600** and diagram **650**) illustrating some aspects of an SCell activation. Diagram **600**, for example, illustrates that upon receiving a PDSCH **610** including an SCell activation **612** (e.g., in a MAC-CE), the UE may send an ACK **604** at a time based on a value K1, at which point the UE may perform MAC-CE L2 processing (B), an RF retuning (C), an RF warmup (D), and may introduce a margin for software and/or baseband updates (E). The UE may be ready to receive a reference signal or SSB at **606**, and would then receive (and measure) one or more reference signals for AGC setting (F), PSS/SSS MIB acquisition (I), may introduce a margin for SSB processing (G), and then channel quality may be determined and a channel quality indication (CQI) **608** may be reported (H). Diagram **650** illustrates an alternative set of operations associated with an SCell that continues to transmit (and a UE that continues to measure) periodic SSB bursts while the SCell is deactivated to reduce latency associated with AGC setting (F), PSS/SSS MIB acquisition (I), the margin for SSB processing (G), and/or the channel quality determination and CQI reporting (H). For example, diagram **650** illustrates that while a PDCCH **652** is transmitted, the PDSCH and ACK may be omitted such that the UE is ready to receive a RS and/or SSB at **670** after an RF retuning (C), an RF warmup (D), and a margin for software and/or baseband updates (E). Additionally, once the UE is ready to receive the RS and/or SSB, it may omit, based on the measurements performed while the SCell was in a deactivated state, the AGC setting (F), PSS/SSS MIB acquisition (I), and/or margin for SSB processing (G) and proceed to the channel quality determination and CQI **680** reporting (H). While this method may reduce a latency associated with an SCell activation, it may be associated with increased power consumption at both the SCell and the UE.

**[0090]** FIG. **7** is a diagram **700** illustrating an alternative method of reducing a time for SCell activation that does not rely on measurements made for a deactivated SCell. As described in relation to FIG. **5**, during a deactivated time period, an SCell may, or may not, transmit period SSB burst **702** and a UE (and the SCell) may receive an activation command **706** indicating for the SCell to initiate an activation to transition to an activated state. The UE may acknowledge the activation command **706** with ACK **708**. However, instead of waiting for a next periodic SSB burst, the SCell may be configured to transmit a temporary RS **720** prior to the next periodic SSB burst to enable fast SCell activation. In some aspects, the temporary RS **720** may be an aperiodic tracking reference signal (TRS) such as a CSI-RS that may be used for AGC and T/F tracking. The aperiodic TRS (e.g., the temporary RS **720**), in some aspects, may be quasi-colocated (QCLed) to a periodic TRS (or CSI-RS) which may, in turn, be QCLed to the periodic SSB burst **702**. However, while this may reduce the activation time, this method is for known cells (e.g., for which the UE already knows some information). Accordingly, aspects presented herein provide a solution that reduces a latency associated with an SCell activation for both known and unknown SCells enabling a more robust latency reduction.

**[0091]** Various aspects relate generally to indicating a configuration of at least aperiodic (e.g., SSBs triggered by transition of the SCell) and/or periodic SSBs associated with a transition from a deactivated state of an SCell to an activated state of the SCell. Some aspects relate specifically to indicating the configuration via a MAC-CE instead of via RRC configuration to configure a set of SSBs associated with the transition from the deactivated state of an SCell to the activated state of the SCell. In some examples, a UE may be configured to receive a configuration for SSBs associated with an SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE and measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. In some aspects, a network (e.g., a PCell, a PSCell, or an activated SCell) may be configured to output a configuration for SSBs from a SCell associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a UE, and output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration.

**[0092]** FIG. **19**A is a call flow diagram **1900** illustrating a network-based coordination of a transitory SSB burst set in accordance with some aspects of the disclosure. In some aspects, an SCell **1905** may transmit, and UE **1904** may receive, a set of sparse SSBs **1910** while the SCell **1905** is deactivated (or is in a deactivated state). The UE **1904** may measure the sparse SSBs **1910** and exchange SSB measurement and/or report **1912** with a PCell **1903**. Based on determining that the SCell **1905** will be activated, the PCell **1903** may exchange transitory SSB coordination messages **1914** with the SCell **1905** to configure and/or determine an allocation for resources for a transitory SSB burst set to be transmitted during a transition time between a deactivated state and an activated state of the SCell **1905**. Based on the coordination (e.g., the transitory SSB coordination messages **1914**) the PCell **1903** may transmit an SCell activation message **1916**. In some aspects, the SCell activation message **1916** may include an indication of the configuration and/or allocation of the resources for the transitory SSB burst set associated with the transition time between a deactivated state and an activated state of the SCell **1905**. The SCell **1905** may then output, and the UE **1904** may receive, the transitory SSB burst set **1918** based on the configuration.

**[0093]** FIG. **19**B is a call flow diagram **1950** illustrating a UE-based coordination of a transitory SSB burst set in accordance with some aspects of the disclosure. In some aspects, an SCell **1905** may transmit, and UE **1904** may receive, a set of sparse SSBs **1960** while the SCell **1905** is deactivated (or is in a deactivated state). The UE **1904** may measure the sparse SSBs **1960** and exchange SSB measurement and/or report **1962** with a PCell **1903**. Based on determining that the SCell **1905** will be activated, the PCell **1903** may transmit an SCell activation message **1964**. The UE **1904** may then transmit, and the SCell **1905** may obtain and/or receive, a transitory SSB coordination message **1966** with the SCell **1905** to configure and/or determine an allocation for resources for a transitory SSB burst set to be transmitted during a transition time between a deactivated state and an activated state of the SCell **1905** based on the SCell activation message **1964**. Based on the coordination (e.g., the transitory SSB coordination message **1966**). The SCell **1905** may then output, and the UE **1904** may receive, the transitory SSB burst set **1968** based on the configuration. As opposed to the network-based coordination that coordinates the transitory SSB burst set configuration before transmitting the SCell activation message **1916**, the UE-based method may introduce additional latency for a coordination of a transitory SSB burst set configuration after the SCell activation message **1964**.

**[0094]** FIG. **8**A illustrates an example time diagram **850** showing periodic SSB transmission (e.g., SSB burst transmission) in a deactivated time period, a transition time period, and an activated time period for an SCell. This example may be referred to as an "always on" periodic SSB. As described herein, different SSB transmissions may be triggered during a transition period to enable the UE to make the measurements of the SSBs for SCell activation in a shorter amount of time. In an example showing a sparse SSB when the SCell is deactivated, the SCell may transmit the periodic SSB bursts. During the transition period, the SCell may transmit additional or different SSB bursts. For example, the SCell may transmit one or more triggered SSB bursts during the transition. The "triggered SSB bursts" may also be referred to as "aperiodic" or "semi-persistent" (or "semi-persistently scheduled" (SPS)) as they are triggered by the transition of the SCell to an activated state. However, once triggered, the additional SSB bursts may be transmitted in a periodic or semi-persistent manner, at least during the transition period. The triggered SSB bursts may also be referred to by other names, such as transitional SSB bursts, conditional SSB bursts, on-demand SSB bursts, or temporary SSB bursts, among other examples. The SCell may continue to transmit the periodic SSB bursts. In some aspects, the parameters of the periodic SSB bursts (e.g., **852**, **854**, or **856**) may be updated to be consistent with the triggered SSB bursts that are triggered upon transition of the SCell to an activated state for the UE.

**[0095]** FIG. **8**A also illustrates an example in which there may be no periodic SSB transmission by the SCell during the deactivated state, and an example in which the triggered SSB bursts during the transition period may also be denser in time than the SSB bursts that are transmitted in the activated period.

**[0096]** As described herein, the UE may use the SSBs during the transition period for cell search, AGC and time and/or frequency tracking associated with the SCell activation. Various parameters can be configured, e.g., signaled, to the UE for the SSB bursts during the transition period. As an example, the UE may receive an indication of a frequency where the SSBs will be transmitted (e.g., an absolute radio frequency channel number (ARFCN), and/or an SSB SCS if the frequency band supports multiple SCSs for SSB. The UE may receive an indication of a number of SSB bursts in the set, and periodicity of the bursts or time gap between consecutive bursts. The UE may receive an indication of number of SSBs in a burst. In some aspects, all of the SSBs in the burst may transmitted by the SCell, or the UE may receive an indication of a subset of SSBs that are actually transmitted SSBs. As an example, the UE may receive a configuration of the maximum number of SSBs in a burst and/or a bitmap indicating the subset of SSBs that will be transmitted. The UE may receive an indication of an SMTC window where UE can search/measure (aperiodic) SSB. As an example, the window may have a starting time relative to the timing of the ACK transmitted by the UE for the SCell activation command and a window duration following the starting time.

**[0097]** As described in connection with FIG. **8**A, the parameters of the periodic SSB bursts may be adjusted, or configured, to be consistent with the triggered SSB bursts. In addition to the triggered SSB bursts, the UE may use the periodic SSB bursts to perform the measurements associated with the SCell activation (e.g., time and/or frequency tracking, AGC, L1/L3 measurements). One or more of the parameters of the periodic SSB bursts may be configured, or adjusted, based on the transition to the activated state and to be more consistent with the triggered SSB. As an example, one or more of a frequency for SSB transmission (e.g., ARFCN), a periodicity of the SSB burst, a number of SSBs in a burst, an indication of SSBs actually transmitted in an SSB burst, an SSB SCS, and/or a time offset to determine a first periodic SSB burst may be indicated to the UE. In some aspects, the parameters for the periodic SSB burst may be the same as, or may correspond to, the parameters for the triggered SSB bursts.

**[0098]** FIG. **8**B is a diagram **800** illustrating a configuration of an SSB burst set during a transition time in accordance with some aspects of the disclosure. Diagram **800** illustrates that during a deactivated state the SCell may transmit a periodic SSB burst **802** (or SSB burst set) although, in some aspects, the SCell may omit and/or skip the transmission of the periodic SSB burst **802**. The PCell (as an example of an activated cell that may be a PScell or another SCell) may transmit an activation command **806** and receive an ACK **808** to initiate a transmission from a deactivated state to an activated state.

**[0099]** In some aspects, the activation command **806** may be one or more MAC-CEs indicating an SCell activation and an associated configuration for a temporary SSB burst set such as temporary SSB burst set **820** and/or a set of periodic SSB bursts including periodic SSB bursts **802**. By using the temporary SSB burst set **820**, the activation time ($T_{activation}$) may be reduced compared to waiting for a sufficient number of periodic SSB bursts. In some aspects, the temporary SSB burst set **820** may include a plurality of SSB bursts and the activation command **806** (e.g., the SCell activation) may indicate at least one of: a frequency associated with the plurality of SSB bursts; a subcarrier spacing associated with the plurality of SSB bursts; a number of SSB bursts in the plurality of SSB bursts; a periodicity or time gap associated with adjacent SSB bursts in the plurality of SSB bursts; a location of SSBs transmitted in each SSB burst in the plurality of SSB bursts (e.g., indicated by a bitmap associated with the SSB burst); an SSB transmission power associated with the SSBs bursts in the plurality of SSB bursts; and a start time and duration of a measurement window associated with the plurality of SSB bursts. In some aspects, the temporary SSB burst set **820** may include a compact SSB burst set including at least one of: an increased number of SSB bursts (compared to a periodic SSB burst), a reduced periodicity or a reduced time gap between adjacent SSB bursts in the compact SSB burst set (compared to a periodic SSB burst), or a reduced measurement window for the plurality of SSB bursts in the compact SSB burst set (compared to a periodic SSB burst). In some aspects, the activation command **806** may further indicate a second configuration for a set of periodic SSB bursts associated with the SCell for an activated time period associated with the activated state of the SCell for the UE and the second configuration may indicate at least one of: a frequency associated with the set of periodic SSB bursts; a subcarrier spacing associated with the set of periodic SSB bursts; a location of SSB occasions in each periodic SSB burst of the set of periodic SSB bursts; and an indication of a timing of a first periodic SSB burst in the set of periodic SSB bursts.

**[0100]** FIG. **9** is a diagram **900** illustrating a DTX/DRX mode of operation at a UE in accordance with some aspects of the disclosure. In some aspects, a cell DTX/DRX may be activated and/or deactivated via RRC or a UE-group common DCI. In some aspects, during a non-active time of a cell DTX/DRX, a cell may skip transmission of, and a UE may skip monitoring for (and/or does not expect to receive), SPS transmissions, a USS PDCCH, a PDCCH with certain formats such as DCI format 2_X (e.g., where X=0, 1, 2, 3, 4, or 5), and/or a periodic or semi-persistent CSI-RS for CSI reports (e.g., including RI). The UE may skip transmission of uplink transmissions, such as transmissions based on a configured grant, scheduling requests, periodic or semi-persistent SRS transmissions (e.g. the UE may transmit SRS for positioning), and/or periodic or semi-persistent CSI reports. For example, when using RRC activation/deactivation, a cell DTX/DRX may be activated when cell DTX/DRX is RRC configured and deactivated when it is released. When using DCI (e.g., a UE-group common DCI or UE-specific DCI), in some aspects, a DCI transmitted in a serving cell may carry an activation/deactivation command for one or multiple serving cells and a UE may monitor the DCI in one serving cell. In some aspects an activation/deactivation command may be applied at least 3 ms after a UE receives the DCI. A UE with an activated DTX/DRX mode of operation that may receive a configuration of a temporary SSB burst set scheduled to be transmitted during a non-active period **922**. As an example, during a non-active period **922**, the UE may be configured to (1) measure all SSB bursts in a temporary SSB burst set **950** (including periodic and aperiodic SSB bursts), (2) measure no SSB bursts in a temporary SSB burst set **970**, or (3) measure aperiodic SSB bursts but omit (or skip) measuring periodic SSB bursts (e.g., periodic SSB burst **992**) in a temporary burst SSB set **990**. Similarly, the cell may be configured to (1) transmit SSB bursts in the temporary SSB burst set **950** (e.g., aperiodic SSB transmissions and periodic SSB transmissions) during a non-active period of the cell DTX, (2) skip transmission of SSB bursts in the temporary SSB burst set **970** (e.g., skip the aperiodic SSB transmissions and the periodic SSB transmissions) during the non-active period of the cell DTX, or (3) skip transmission of the periodic SSB transmissions (e.g., periodic SSB burst **992**) in the temporary SSB burst set **990** and transmit the aperiodic SSB transmissions in the temporary SSB burst set **990** during the non-active period of the cell DTX.

**[0101]** In some aspects, the configuration may be dynamic, such that the UE may be configured by the network (a PCell or other serving cell) to either measure and/or monitor for, or skip/omit measuring and/or monitoring for the aperiodic and/or periodic SSB bursts. For example, during a first time period **910** with DTX/DRX deactivated, or during an active time period **921** of a second time period **920** with DTX/DRX activated, a UE may measure and/or monitor for each SSB burst (not shown). During a non-active time period **922** of the second time period **920** with DTX/DRX activated, the UE may be configured to measure and/or monitor for, or skip/omit measuring and/or monitoring for periodic and/or aperiodic SSB bursts in temporary SSB burst sets **950**, **970**, or **990**.

**[0102]** FIG. **10** is a diagram **1000** illustrating possible configurations for a transitory SSB burst set and/or a periodic SSB burst set in accordance with some aspects of the disclosure. In some aspects, the temporary SSB burst set **1020** may include a plurality of SSB bursts and an associated SCell activation (e.g., activation command **806** of FIG. **8**B) may indicate at least one of: a frequency associated with the plurality of SSB bursts; a subcarrier spacing associated with the plurality of SSB bursts; a number of SSB bursts in the plurality of SSB bursts; a periodicity or time gap associated with adjacent SSB bursts in the plurality of SSB bursts; a location of SSBs transmitted in each SSB burst in the plurality of SSB bursts (e.g., indicated by a bitmap associated with the SSB burst); an SSB transmission power associated with the SSBs bursts in the plurality of SSB bursts; and a start time and duration of a measurement window associated with the plurality of SSB bursts. In some aspects, the temporary SSB burst set **820** may include a compact SSB burst set including at least one of: an increased number of SSB bursts (compared to a periodic SSB burst), a reduced periodicity or a reduced time gap between adjacent SSB bursts in the compact SSB burst set (compared to a periodic SSB burst set or periodic SSB burst configuration), or a reduced measurement window for the plurality of SSB bursts in the compact SSB burst set (compared to a measurement window associated with periodic SSB bursts). In some aspects, the activation command **806** may further indicate a second configuration for a set of periodic SSB bursts associated with the SCell for an activated time period associated with the activated state of the SCell for the UE and the second configuration may indicate at least one of: a frequency associated with the set of periodic SSB bursts; a subcarrier spacing associated with the set of periodic SSB bursts; a location of SSB occasions in each periodic SSB burst of the set of periodic SSB bursts; and an indication of a timing of a first periodic SSB burst in the set of periodic SSB bursts.

**[0103]** For example, for a first SCell **1010** a configuration may indicate a first set of SSBs (e.g., a temporary SSB burst set **1020**) including a set of aperiodic SSB bursts (e.g., aperiodic SSB burst **1004**) and an aperiodic/periodic SSB burst **1006**. The aperiodic/periodic SSB burst **1006**, in some aspects, may be any of the SSB bursts in the temporary SSB burst set identified as a reference for transmitting additional periodic SSB bursts (e.g., periodic SSB burst **1002**) during an activated state of the SCell **1010**. In some aspects, the aperiodic/periodic SSB burst **1006** in the temporary SSB burst set **1020** may be an SSB burst in the set of aperiodic SSB bursts identified by a bitmap associated with the SSB bursts in the temporary SSB burst set **1020** used as a timing reference for the periodic SSB burst **1002** (and subsequent periodic SSB bursts). The periodic SSB bursts, in some aspects, may be configured to have the same characteristics as the reference aperiodic SSB burst (e.g., a same frequency, SCS, location of SSBs transmitted in each periodic SSB burst, transmission power, and/or start time and duration, relative to a time associated with the periodic SSB burst, of a measurement window associated with the periodic SSB bursts as for the aperiodic/periodic SSB burst **1006**). Alternatively, in some aspects, the aperiodic/periodic SSB burst **1006** (and the subsequent periodic SSB bursts transmitted during an activated period, such as periodic SSB burst **1002**) may be a periodic SSB burst configured separately from the aperiodic SSB bursts (e.g., aperiodic SSB burst **1004**) such that any or all of the frequency, SCS, location of SSBs transmitted in each periodic SSB burst, transmission power, and/or start time and duration, relative to a time associated with the periodic SSB burst, may be different from (or the same as) those associated with the aperiodic SSB bursts (e.g., aperiodic SSB burst **1004** of the temporary SSB burst set **1020**).

**[0104]** In some aspects, as shown in relation to a second SCell **1030**, a temporary SSB burst set **1040** may include a set of aperiodic SSB bursts (e.g., aperiodic SSB bursts **1034**). The aperiodic SSB bursts may fall within a configured SSB measurement window **1045**. The SSB measurement window **1045**, in some aspects, may be used as a reference time for a first periodic SSB burst (e.g., periodic SSB burst **1032**) after the temporary SSB burst set **1040**. As illustrated, the reference time may, in some aspects, be one of the beginning of the SSB measurement window **1045** or the end of the SSB measurement window **1045**.

**[0105]** As illustrated, the number of SSB opportunities/locations associated with each aperiodic SSB burst **1034** may, for a same or smaller SCS, be smaller than the number of SSB opportunities/locations associated with each aperiodic SSB burst **1004** or, for a larger SCS, may be larger than the number of SSB opportunities/locations associated with each aperiodic SSB burst **1004**. Additionally, the number of SSBs transmitted in each aperiodic SSB burst may be larger or smaller based on the configurations of the aperiodic SSB bursts (e.g., aperiodic SSB bursts **1004** and **1034**). In some aspects, as illustrated by the temporary SSB burst sets for SCell **1010** and **1030**, the number of SSB bursts in a temporary SSB burst set may be different. For example, the number of SSB bursts in the temporary SSB burst set **1040** may be larger than the number of SSB bursts in the temporary SSB burst set **1020**. Additionally, or alternatively, any of the frequency, SCS, location of SSBs transmitted in each periodic SSB burst, transmission power, and/or start time and duration of a measurement window associated with the aperiodic SSB bursts may be the same as, or different from, those for the aperiodic SSB burst **1004**. The characteristics of the periodic SSB burst **1032**, in some aspects, may be based on the configuration for the aperiodic SSB bursts and/or the temporary SSB burst set **1040**. For example, the periodic SSB burst **1032** may be configured to have the same characteristics as the aperiodic SSB bursts (e.g., a same frequency, SCS, number and location of SSBs transmitted in each periodic SSB burst, transmission power, and/or start time and duration, relative to a time associated with the periodic SSB burst, of a measurement window associated with the periodic SSB bursts). Alternatively, one or more of the frequency, SCS, number and location of SSBs transmitted in each periodic SSB burst, transmission power, and/or start time and duration, relative to a time associated with the periodic SSB burst, of a measurement window associated with the periodic SSB bursts may be separately configured and/or determined (e.g., based on a known rule or configuration) based on the corresponding characteristic of the aperiodic SSB bursts in the temporary SSB burst set **1040**.

**[0106]** In some aspects, as shown in relation to a third SCell **1050**, a temporary SSB burst set **1060** may include a set of aperiodic SSB bursts (e.g., aperiodic SSB bursts **1054**). The aperiodic SSB bursts may fall within a configured SSB measurement window **1065**. The temporary SSB burst set **1060**, in some aspects, may be followed by an activation time **1067** that may be used as a reference time for a first periodic SSB burst (e.g., periodic SSB burst **1052**) after the temporary SSB burst set **1060**. A reference time for the configurations associated with either the second SCell **1030** or the third SCell **1050** may be based on a slot containing the reference time (a slot containing the beginning and/or end of a measurement window or an activation time). In some aspects, the SCS used to define the slot boundaries may be any of an SCS associated with the periodic SSB, an SCS associated with an active UL and/or DL BWP of the cell (the PCell, the PSCell, or the activated SCell) transmitting an activation command, or an SCS associated with an active UL and/or DL BWP of the SCell (e.g., the second SCell **1030** or the third SCell **1050**), or may be based on a configured and or fixed SCS.

**[0107]** As described above, any or all of the frequency, SCS, location of SSBs transmitted in each periodic SSB burst, transmission power, and/or start time and duration, relative to a time associated with the periodic SSB burst, may be different from (or the same as) those associated with the aperiodic SSB bursts (e.g., aperiodic SSB burst **1054** of the temporary SSB burst set **1060**). The characteristics of the periodic SSB burst **1052**, in some aspects, may be based on the configuration for the aperiodic SSB bursts and/or the temporary SSB burst set **1060**. For example, the periodic SSB burst **1052** may be configured to have the same characteristics as the aperiodic SSB bursts (e.g., a same frequency, SCS, number and location of SSBs transmitted in each periodic SSB burst, transmission power, and/or start time and duration, relative to a time associated with the periodic SSB burst, of a measurement window associated with the periodic SSB bursts). Alternatively, one or more of the frequency, SCS, number and location of SSBs transmitted in each periodic SSB burst, transmission power, and/or start time and duration, relative to a time associated with the periodic SSB burst, of a measurement window associated with the periodic SSB bursts may be separately configured and/or determined (e.g., based on a known rule or configuration) based on the corresponding characteristic of the aperiodic SSB bursts in the temporary SSB burst set **1060**.

**[0108]** In some aspects, a periodic TRS transmission associated with (or transmitted by) the SCell may be QCLed with the periodic SSB (e.g., one of the periodic SSB bursts **1002**, **1032**, or **1052**). A periodic TRS transmission, in some aspects, may be QCLed with either an aperiodic SSB burst/transmission or a periodic SSB burst/transmission. For example, a TRS transmission may be QCLed to an aperiodic burst/SSB transmission for a TRS transmission scheduled prior to a first periodic SSB burst/transmission.

**[0109]** FIG. **11** is a call flow diagram **1100** illustrating a method of configuring and/or triggering a transitory SSB burst set and/or a periodic SSB set in accordance with some aspects of the disclosure. The method is illustrated in relation to a network **1102** associated with a Cell **1103** (e.g., an activated PCell, PSCell, or SCell serving the UE **1104**), a first SCell **1105**, and a second SCell **1107** (e.g., where the Cell **1103**, the first SCell **1105**, and the second SCell may be provided by a network device or network node such as a base station or DU of a base station) in communication with a UE **1104** (e.g., as an example of a wireless device). Aspects performed by the Cell **1003** (e.g., a PCell, PSCell, or SCell) may be performed by a base station in aggregation or by one or more components of a disaggregated base station, for example the actions described as being performed by the Cell **1003** may be performed by an RU, CU, or DU of a disaggregated base station. In some aspects, the first SCell **1105** and the second SCell **1107** may be deactivated at the beginning of the method. The functions ascribed to the network **1102** or a particular cell, in some aspects, may be performed by one or more components of a network entity, a network node, or a network device (a single network entity/node/device or a disaggregated network entity/node/device as described above in relation to FIG. **1**) associated with the network **1102**. Similarly, the functions ascribed to the UE **1104**, in some aspects, may be performed by one or more components of a wireless device supporting communication with a network entity/node/device. Accordingly, references to "transmitting" in the description below may be understood to refer to a first component of the network **1102** (or the Cell **1103**, the first SCell **1105**, the second SCell **1107**, or the UE **1104**) outputting (or providing) an indication of the content of the transmission to be transmitted by a different component of the network **1102** (or the Cell **1103**, the first SCell **1105**, the second SCell **1107**, or the UE **1104**). Similarly, references to "receiving" in the description below may be understood to refer to a first component of the network **1102** (or the Cell **1103**, the first SCell **1105**, the second SCell **1107**, or the UE **1104**) receiving a transmitted signal and outputting (or providing) the received signal (or information based on the received signal) to a different component of the network **1102** (or the Cell **1103**, the first SCell **1105**, the second SCell **1107**, or the UE **1104**).

**[0110]** In some aspects, the network **1102** (e.g., via the Cell **1103**) may transmit, and the UE **1104**, the first SCell **1105**, and the second SCell **1107**, may obtain and/or receive, an SSB configuration **1110** for a deactivated state. The SSB configuration **1110** for the deactivated state may indicate an omission of periodic SSB bursts or a transmission of a set of periodic SSB bursts for the deactivated state. In some aspects, the period may be larger than a period associated with a set of periodic SSB bursts associated with an activated state and/or the characteristics of the set of periodic SSB bursts for the deactivated state may be different from the characteristics of the set of periodic SSB bursts for the activated state (different number of SSB transmissions per burst, different SSB opportunities/locations within a burst, etc.). Based on the SSB configuration **1110**, the UE **1104** may monitor for and/or measure the configured set of periodic SSB bursts at **1111** (e.g., including the SSB burst **1112** transmitted by the first SCell **1105**). In some aspects, the second SCell **1107** may be configured by SSB configuration **1110** to omit transmitting SSB bursts during a deactivated period or may not transmit an SSB burst based on a first SSB burst occasion configured by the SSB configuration **1110** not occurring before the transition period **1121**.

**[0111]** Upon determining to activate one or more SCells, e.g., SCell **1105** and SCell **1107**, the network **1102** (e.g., via Cell **1103**) may perform an SCell activation and SSB configuration and/or triggering **1114**. The SCell activation and SSB triggering **1114**, in some aspects, may include a UE **1104** receiving, and the network **1102** (e.g., via the Cell **1103**) may transmit, one or more sets of messages associated with SCell activation and/or SSB transmission configuration and/or triggering, e.g., messages **1118** and **1120**. The network **1102** (e.g., via Cell **1103**) may output and/or transmit, and the UE **1104**, the first SCell **1105**, and the second SCell **1107**, may obtain and/or receive one or more of the messages **1118** and **1120**. The SSB configuration may include one or more configurations for one or more periodic and/or transitory SSB burst sets. Each of the one or more configurations indicated (or configured by) the messages **1118** and/or the messages **1120** may indicate one or more of a frequency associated with transmitted SSBs associated with the configuration, an SCS associated with transmitted SSBs associated with the configuration, a number of SSB bursts associated with the configuration, a periodicity or time gap associated with adjacent SSB bursts or transmitted SSBs associated with the configuration, a location of SSBs transmitted in each SSB burst associated with the configuration (e.g., a bitmap indicating candidate SSB occasions/locations for which an SSB will be transmitted), an SSB transmission power for transmitted SSBs associated with the configuration, and a start time and duration of a measurement window associated with transmitted SSBs associated with the configuration, the configuration may be associated with any configurations for transitory SSB burst sets and periodic SSB bursts (or burst sets) as described in relation to FIG. **10**.

**[0112]** In some aspects the message **1118** may be a MAC-CE indicating an activated or deactivated state for one or more SCells (e.g., one or both of the first SCell **1105** and the second SCell **1107**) configured for one or more UEs and an associated SSB configuration indicating the characteristics described above. If the message **1118** indicates an activation and an SSB configuration for both the first SCell **1105** and the second SCell **1107**, the message **1120** may be omitted or, if the first SCell **1105** (but not the second SCell **1107**) is activated (and an SSB configured), the message **1120** may be an additional activation (and SSB configuration) associated with the second SCell **1107**. In some aspects, the messages **1118** may include a first indication of a configuration of a first set of (aperiodic) SSB bursts (for one or more of the first SCell **1105** and/or the second SCell **1107**) while the messages **1120** may include a second indication of a configuration of a second set of (periodic) SSB bursts (for one or more of the first SCell **1105** and/or the second SCell **1107**).

**[0113]** Based on the message **1118** and/or messages **1120**, the UE **1104** may, during transition period **1121**, measure, at **1122**, configured and/or triggered SSBs (e.g., transitory SSB burst set **1124** and/or transitory SSB burst set **1126**). Transitory SSB burst set **1124** may be associated with a first set of values for one or more of a frequency associated with transitory SSB burst set **1124**, an SCS associated with transitory SSB burst set **1124**, a number of SSB bursts associated with transitory SSB burst set **1124**, a periodicity or time gap associated with adjacent SSB bursts or transmitted SSBs associated with transitory SSB burst set **1124**, a location of SSBs transmitted in each SSB burst associated with transitory SSB burst set **1124**, an SSB transmission power for transmitted SSBs associated with transitory SSB burst set **1124**, and a start time and duration of a measurement window associated with transmitted SSBs associated with transitory SSB burst set **1124**. Similarly, transitory SSB burst set **1126** may be associated with a second set of values for one or more of a frequency associated with transitory SSB burst set **1126**, an SCS associated with transitory SSB burst set **1126**, a number of SSB bursts associated with transitory SSB burst set **1126**, a periodicity or time gap associated with adjacent SSB bursts or transmitted SSBs associated with transitory SSB burst set **1126**, a location of SSBs transmitted in each SSB burst associated with transitory SSB burst set **1126**, an SSB transmission power for transmitted SSBs associated with transitory SSB burst set **1126**, and a start time and duration of a measurement window associated with transmitted SSBs associated with transitory SSB burst set **1126**.

**[0114]** Based on the measurements made at **1122** of the transitory SSB burst set **1124** and/or the transitory SSB burst set **1126**, the first SCell **1105** and the second SCell **1107** may be activated (may transition from the transition 'state' during transition period **1121** to an activated state during an activated period **1127**). During the activated period **1127**, the first SCell **1105** may transmit, and the UE **1104** may receive, periodic SSBs **1128** (e.g., periodic SSB bursts) with a period that is different from the period associated with the transitory SSB burst set **1124**. Similarly, during the activated period **1127**, the second SCell **1107** may transmit, and the UE **1104** may receive, periodic SSBs **1130** (e.g., periodic SSB bursts) with a period that is different from the period associated with the transitory SSB burst set **1126**. In some aspects, the periodic SSBs **1128** (or the periodic SSBs **1130**) may "inherit" characteristics from the transitory SSB burst set **1124** (or the transitory SSB burst set **1126**) such as a frequency, an SCS, a location of SSBs transmitted in each periodic SSB burst, or an SSB transmission power, while other characteristics may be different from the characteristics of the transitory SSB burst set **1124** (or transitory SSB burst set **1126**), but, in some aspects, may be based on the related characteristics as described above in relation to FIG. **10**.

**[0115]** FIG. **12** is a flowchart **1200** of a method of wireless communication. The method may be performed by a wireless device such as a UE (e.g., the UE **104**, **1104**; the apparatus **1604**). In some aspects, the UE may receive a (third) configuration for SSBs associated with an SCell for a deactivated time period associated with the deactivated state of the SCell for the UE. In some aspects, the (third) configuration may include a (third) set of periodic SSB bursts associated with one or more of a frequency associated with the (third) set of periodic SSB bursts, a subcarrier spacing associated with the (third) set of periodic SSB bursts, a number of SSB occasions in each periodic SSB burst of the (third) set of periodic SSB bursts, a location of SSB occasions in each SSB in the (third) set of periodic SSB bursts, and/or a start time and duration of a measurement window associated with the (third) set of periodic SSB bursts. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**, e.g., a cell provided by a DU) may transmit, and the UE **1104** may receive, SSB configuration **1110**.

**[0116]** The UE, in some aspects, may measure, during the deactivated time period, a (third) set of SSBs from the SCell based on the third configuration. In some aspects, the (third) set of SSBs may be a (third) set of periodic SSBs configured with a longer period than a period associated with periodic SSB bursts for one or more of a transition state or an activated state of the SCell. For example, referring to FIG. **11**, the UE **1104** may (at **1111**) measure, and the network **1102** (via the Cell **1103**) may output and/or transmit, SSB burst **1112**.

**[0117]** At **1206**, the UE may receive a (first) configuration for SSBs associated with the SCell for the transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE. For example, **1206** may be performed by application processor (s) **1606**, cellular baseband processor(s) **1624**, transceiver(s) **1622**, antenna(s) **1680**, and/or aperiodic SSB configuration component **198** of FIG. **16**. In some aspects, the (first) configuration may include a (first) set of SSB bursts for the transition period may indicate one or more of a frequency associated with transmitted SSBs associated with the (first) configuration, an SCS associated with transmitted SSBs associated with the (first) configuration, a number of SSB bursts associated with the (first) configuration, a periodicity or time gap associated with adjacent SSB bursts or transmitted SSBs associated with the (first) configuration, a location of SSBs transmitted in each SSB burst associated with the (first) configuration (e.g., a bitmap indicating candidate SSB occasions locations for which an SSB will be transmitted), an SSB transmission power for transmitted SSBs associated with the (first) configuration, and a start time and duration of a measurement window associated with transmitted SSBs associated with the (first) configuration. The (first) set of SSBs, in some aspects, may include an increased number of SSB bursts, a reduced periodicity or a reduced time gap between adjacent SSB bursts in the compact SSB burst set, or a reduced measurement window for the plurality of SSB bursts in the compact SSB burst set (when compared to a second set of SSBs associated with the activated state of the SCell). In some aspects, the configuration may be received from one of a PCell, a PSCell, or an additional SCell. The configuration, in some aspects, may further configure and/or include a configuration for at least one of: a second set of SSBs associated with an activated time period associated with the activated state of the SCell, or the third set of SSBs associated with the deactivated time period associated with the deactivated state of the SCell. In some aspects, the second set of SSBs may include a set of periodic SSB bursts and the second configuration may indicate at least one of: a frequency associated with the set of periodic SSB bursts, a subcarrier spacing associated with the set of periodic SSB bursts, a location of SSB occasions in each periodic SSB burst of the set of periodic SSB bursts, an SSB transmission power, and/or an indication of a timing of a first periodic SSB burst in the set of periodic SSB bursts. The configuration, in some aspects, may be received via a MAC-CE. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**) may transmit, and the UE **1104** may receive, messages **1118** and/or **1120** including a configuration for the transitory SSB burst set **1124** and/or **1126** and/or for periodic SSBs **1128** and/or periodic SSBs **1130**. For example, a DU may transmit the messages **1118** and **1120**.

**[0118]** At **1208**, the UE may measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the (first) configuration. For example, **1208** may be performed by application processor(s) **1606**, cellular baseband processor(s) **1624**, transceiver(s) **1622**, antenna(s) **1680**, and/or aperiodic SSB configuration component **198** of FIG. **16**. The measuring, at **1208**, may be associated with performing one or more UE operations such as AGC, cell search, radio resource management (RRM), radio link monitoring (RLM), beam measurement or other operations associated with RS and/or SSB measurement. In some aspects, the first set of SSBs may be configured according to any of the configurations discussed in relation to FIG. **10**. For example, the first set of SSBs from the SCell may include a first set of SSB bursts associated with a first periodicity, and at least one SSB burst in the first set of SSB bursts is identified as a first SSB burst in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE, where the second set of SSBs is associated with a second periodicity. In some aspects, the first set of SSBs may be measured during a measurement window, and the configuration for the SSBs may include an indication of a timing offset from one of a beginning or an end of the measurement window for a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. The (first) configuration for the SSBs, in some aspects, may include an indication of a timing offset from an activation time to a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. In some aspects, the first set of SSBs may be used as reference for identifying a QCL of a tracking reference signal associated with the SCell. For example, referring to FIG. **11**, the UE **1104** may (at **1122**) measure, and the network **1102** (via the first SCell **1105** and/or the second SCell **1107**) may output and/or transmit, transitory SSB burst set **1124** and/or the transitory SSB burst set **1126**. Similarly, the UE **1104** may measure, and the network **1102** (via the first SCell **1105** and/or the second SCell **1107**) may output and/or transmit, periodic SSBs **1128** and/or periodic SSBs **1130**.

**[0119]** FIG. **13** is a flowchart **1300** of a method of wireless communication. The method may be performed by a wireless device such as a UE (e.g., the UE **104**, **1104**; the apparatus **1604**). At **1302**, the UE may receive a (third) configuration for SSBs associated with an SCell for a deactivated time period associated with the deactivated state of the SCell for the UE. For example, **1302** may be performed by application processor(s) **1606**, cellular baseband processor(s) **1624**, transceiver(s) **1622**, antenna(s) **1680**, and/or aperiodic SSB configuration component **198** of FIG. **16**. In some aspects, the (third) configuration may include a (third) set of periodic SSB bursts associated with one or more of a frequency associated with the (third) set of periodic SSB bursts, a subcarrier spacing associated with the (third) set of periodic SSB bursts, a number of SSB occasions in each periodic SSB burst of the (third) set of periodic SSB bursts, a location of SSB occasions in each SSB in the (third) set of periodic SSB bursts, and/or a start time and duration of a measurement window associated with the (third) set of periodic SSB bursts. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**) may transmit, and the UE **1104** may receive, SSB configuration **1110**.

**[0120]** At **1304**, the UE may measure, during the deactivated time period, a (third) set of SSBs from the SCell based on the third configuration. For example, **1304** may be performed by application processor(s) **1606**, cellular baseband processor(s) **1624**, transceiver(s) **1622**, antenna(s) **1680**, and/or aperiodic SSB configuration component **198** of FIG. **16**. In some aspects, the (third) set of SSBs may be a (third) set of periodic SSBs configured with a longer period than a period associated with periodic SSB bursts for one or more of a transition state or an activated state of the SCell. For example, referring to FIG. **11**, the UE **1104** may (at **1111**) measure, and the network **1102** (via the Cell **1103**) may output and/or transmit, SSB burst **1112**.

**[0121]** At **1306**, the UE may receive a (first) configuration for SSBs associated with the SCell for the transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE. For example, **1306** may be performed by application processor(s) **1606**, cellular baseband processor(s) **1624**, transceiver(s) **1622**, antenna(s) **1680**, and/or aperiodic SSB configuration component **198** of FIG. **16**. In some aspects, the (first) configuration may include a (first) set of SSB bursts for the transition period may indicate one or more of a frequency associated with transmitted SSBs associated with the (first) configuration, an SCS associated with transmitted SSBs associated with the (first) configuration, a number of SSB bursts associated with the (first) configuration, a periodicity or time gap associated with adjacent SSB bursts or transmitted SSBs associated with the (first) configuration, a location of SSBs transmitted in each SSB burst associated with the (first) configuration (e.g., a bitmap indicating candidate SSB occasions locations for which an SSB will be transmitted), an SSB transmission power for transmitted SSBs associated with the (first) configuration, and a start time and duration of a measurement window associated with transmitted SSBs associated with the (first) configuration. The (first) set of SSBs, in some aspects, may include an increased number of SSB bursts, a reduced periodicity or a reduced time gap between adjacent SSB bursts in the compact SSB burst set, or a reduced measurement window for the plurality of SSB bursts in the compact SSB burst set (when compared to a second set of SSBs associated with the activated state of the SCell). In some aspects, the configuration may be received from one of a PCell, a PSCell, or an additional SCell. The configuration, in some aspects, may be received via a MAC-CE. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**) may transmit, and the UE **1104** may receive, messages **1118** and/or **1120** including a configuration for the transitory SSB burst set **1124** and/or **1126**.

**[0122]** At **1308**, the UE may measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the (first) configuration. For example, **1308** may be performed by application processor(s) **1606**, cellular baseband processor (s) **1624**, transceiver(s) **1622**, antenna(s) **1680**, and/or aperiodic SSB configuration component **198** of FIG. **16**. The measuring, at **1308**, may be associated with performing one or more UE operations such as AGC, cell search, RRM, RLM, beam measurement or other operations associated with RS and/or SSB measurement. In some aspects, the first set of SSBs may be configured according to any of the configurations discussed in relation to FIG. **10**. For example, the first set of SSBs from the SCell may include a first set of SSB bursts associated with a first periodicity, and at least one SSB burst in the first set of SSB bursts is identified as a first SSB burst in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE, where the second set of SSBs is associated with a second periodicity. In some aspects, the first set of SSBs may be measured during a measurement window, and the configuration for the SSBs may include an indication of a timing offset from one of a beginning or an end of the measurement window for a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. The (first) configuration for the SSBs, in some aspects, may include an indication of a timing offset from an activation time to a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. In some aspects, the first set of SSBs may be used as reference for identifying a QCL of a tracking reference signal associated with the SCell. For example, referring to FIG. **11**, the UE **1104** may (at **1122**) measure, and the network **1102** (via the first SCell **1105** and/or the second SCell **1107**) may output and/or transmit, transitory SSB burst set **1124** and/or the transitory SSB burst set **1126**.

**[0123]** At **1310**, the UE may receive a second configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. For example, **1310** may be performed by application processor(s) **1606**, cellular baseband processor(s) **1624**, transceiver(s) **1622**, antenna(s) **1680**, and/or aperiodic SSB configuration component **198** of FIG. **16**. In some aspects, the second set of SSBs may include a set of periodic SSB bursts and the second configuration may indicate at least one of: a frequency associated with the set of periodic SSB bursts, a subcarrier spacing associated with the set of periodic SSB bursts, a location of SSB occasions in each periodic SSB burst of the set of periodic SSB bursts, an SSB transmission power, and/or an indication of a timing of a first periodic SSB burst in the set of periodic SSB bursts. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**) may transmit, and the UE **1104** may receive, messages **1118** and/or **1120** including a configuration for the periodic SSBs **1128** and/or **1130**.

**[0124]** Finally, at **1312**, the UE may measure, during the activated time period, a second set of SSBs from the SCell based on the second configuration. For example, **1312** may be performed by application processor(s) **1606**, cellular baseband processor(s) **1624**, transceiver(s) **1622**, antenna(s) **1680**, and/or aperiodic SSB configuration component **198** of FIG. **16**. Referring, for example, to FIG. **11**, the UE **1104** may measure, and the network **1102** (via the first SCell **1105** and/or the second SCell **1107**) may output and/or transmit, transitory SSB burst set **1128** and/or transitory SSB burst set **1130**.

**[0125]** FIG. **14** is a flowchart **1400** of a method of wireless communication. The method may be performed by a network or one or more network components (e.g., the base station **102**; the network **1102**; the Cell **1103**, the first SCell **1105**, and the second SCell **1107**; the network entity **1602**, **1702**, **1860**). In some aspects, the network may output a (third) configuration for SSBs associated with an SCell for a deactivated time period associated with the deactivated state of the SCell for the UE. In some aspects, the (third) configuration may include a (third) set of periodic SSB bursts associated with one or more of a frequency associated with the (third) set of periodic SSB bursts, a subcarrier spacing associated with the (third) set of periodic SSB bursts, a number of SSB occasions in each periodic SSB burst of the (third) set of periodic SSB bursts, a location of SSB occasions in each SSB in the (third) set of periodic SSB bursts, and/or a start time and duration of a measurement window associated with the (third) set of periodic SSB bursts. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**) may transmit, and the UE **1104** may receive, SSB configuration **1110**.

**[0126]** The network, in some aspects, may output, during the deactivated time period, a (third) set of SSBs from the SCell based on the third configuration. In some aspects, the (third) set of SSBs may be a (third) set of periodic SSBs configured with a longer period than a period associated with periodic SSB bursts for one or more of a transition state or an activated state of the SCell. For example, referring to FIG. **11**, the UE **1104** may (at **1111**) measure, and the network **1102** (via the Cell **1103**) may output and/or transmit, SSB burst **1112**.

**[0127]** At **1406**, the network may output a (first) configuration for SSBs associated with the SCell for the transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE. For example, **1406** may be performed by CU processor(s) **1712**, DU processor(s) **1732**, RU processor(s) **1742**, transceiver(s) **1746**, antenna(s) **1780**, network processor **1812**, network interface **1880**, and/or aperiodic SSB configuration component **199** of FIGS. **17** and **18**. In some aspects, the (first) configuration may include a (first) set of SSB bursts for the transition period may indicate one or more of a frequency associated with transmitted SSBs associated with the (first) configuration, an SCS associated with transmitted SSBs associated with the (first) configuration, a number of SSB bursts associated with the (first) configuration, a periodicity or time gap associated with adjacent SSB bursts or transmitted SSBs associated with the (first) configuration, a location of SSBs transmitted in each SSB burst associated with the (first) configuration (e.g., a bitmap indicating candidate SSB occasions locations for which an SSB will be transmitted), an SSB transmission power for transmitted SSBs associated with the (first) configuration, and a start time and duration of a measurement window associated with transmitted SSBs associated with the (first) configuration.

The (first) set of SSBs, in some aspects, may include an increased number of SSB bursts, a reduced periodicity or a reduced time gap between adjacent SSB bursts in the compact SSB burst set, or a reduced measurement window for the plurality of SSB bursts in the compact SSB burst set (when compared to a second set of SSBs associated with the activated state of the SCell). In some aspects, the configuration may be received from one of a PCell, a PSCell, or an additional SCell. The configuration, in some aspects, may further configure and/or include a configuration for at least one of: a second set of SSBs associated with an activated time period associated with the activated state of the SCell, or the third set of SSBs associated with the deactivated time period associated with the deactivated state of the SCell. In some aspects, the second set of SSBs may include a set of periodic SSB bursts and the second configuration may indicate at least one of: a frequency associated with the set of periodic SSB bursts, a subcarrier spacing associated with the set of periodic SSB bursts, a location of SSB occasions in each periodic SSB burst of the set of periodic SSB bursts, an SSB transmission power, and/or an indication of a timing of a first periodic SSB burst in the set of periodic SSB bursts. The configuration, in some aspects, may be received via a MAC-CE. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**) may transmit, and the UE **1104** may receive, messages **1118** and/or **1120** including a configuration for the transitory SSB burst set **1124** and/or **1126** and/or for periodic SSBs **1128** and/or periodic SSBs **1130**.

**[0128]** At **1408**, the network may output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the (first) configuration. For example, **1408** may be performed by CU processor(s) **1712**, DU processor(s) **1732**, RU processor(s) **1742**, transceiver(s) **1746**, antenna(s) **1780**, network processor **1812**, network interface **1880**, and/or aperiodic SSB configuration component **199** of FIGS. **17** and **18**. The first set of SSBs may be output, at **1408**, for the UE to perform one or more UE operations such as AGC, cell search, RRM, RLM, beam measurement or other operations associated with RS and/or SSB measurement. In some aspects, the first set of SSBs may be configured according to any of the configurations discussed in relation to FIG. **10**. For example, the first set of SSBs from the SCell may include a first set of SSB bursts associated with a first periodicity, and at least one SSB burst in the first set of SSB bursts is identified as a first SSB burst in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE, where the second set of SSBs is associated with a second periodicity. In some aspects, the first set of SSBs may be measured during a measurement window, and the configuration for the SSBs may include an indication of a timing offset from one of a beginning or an end of the measurement window for a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. The (first) configuration for the SSBs, in some aspects, may include an indication of a timing offset from an activation time to a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. In some aspects, the first set of SSBs may be used as reference for identifying a QCL of a tracking reference signal associated with the SCell. For example, referring to FIG. **11**, the UE **1104** may (at **1122**) measure, and the network **1102** (via the first SCell **1105** and/or the second SCell **1107**) may output and/or transmit, transitory SSB burst set **1124** and/or the transitory SSB burst set **1126**. Similarly, the UE **1104** may measure, and the network **1102** (via the first SCell **1105** and/or the second SCell **1107**) may output and/or transmit, periodic SSBs **1128** and/or periodic SSBs **1130**.

**[0129]** FIG. **15** is a flowchart **1500** of a method of wireless communication. The method may be performed by a network or one or more network components (e.g., the base station **102**; the network **1102**; the Cell **1103**, the first SCell **1105**, and the second SCell **1107**; the network entity **1602**, **1702**, **1860**). At **1502**, the network may output a (third) configuration for SSBs associated with an SCell for a deactivated time period associated with the deactivated state of the SCell for the UE. For example, **1502** may be performed by CU processor(s) **1712**, DU processor(s) **1732**, RU processor(s) **1742**, transceiver(s) **1746**, antenna(s) **1780**, network processor **1812**, network interface **1880**, and/or aperiodic SSB configuration component **199** of FIGS. **17** and **18**. In some aspects, the (third) configuration may include a (third) set of periodic SSB bursts associated with one or more of a frequency associated with the (third) set of periodic SSB bursts, a subcarrier spacing associated with the (third) set of periodic SSB bursts, a number of SSB occasions in each periodic SSB burst of the (third) set of periodic SSB bursts, a location of SSB occasions in each SSB in the (third) set of periodic SSB bursts, and/or a start time and duration of a measurement window associated with the (third) set of periodic SSB bursts. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**) may transmit, and the UE **1104** may receive, SSB configuration **1110**.

**[0130]** At **1504**, the network may output, during the deactivated time period, a (third) set of SSBs from the SCell based on the third configuration. For example, **1504** may be performed by CU processor(s) **1712**, DU processor(s) **1732**, RU processor(s) **1742**, transceiver(s) **1746**, antenna(s) **1780**, network processor **1812**, network interface **1880**, and/or aperiodic SSB configuration component **199** of FIGS. **17** and **18**. In some aspects, the (third) set of SSBs may be a (third) set of periodic SSBs configured with a longer period than a period associated with periodic SSB bursts for one or more of a transition state or an activated state of the SCell. For example, referring to FIG. **11**, the UE **1104** may (at **1111**) measure, and the network **1102** (via the Cell **1103**) may output and/or transmit, SSB burst **1112**.

**[0131]** At **1506**, the network may output a (first) configuration for SSBs associated with the SCell for the transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE. For example, **1506** may be performed by CU processor(s) **1712**, DU processor(s) **1732**, RU processor(s) **1742**, transceiver(s) **1746**, antenna(s) **1780**, network processor **1812**, network interface **1880**, and/or aperiodic SSB configuration component **199** of FIGS. **17** and **18**. In some aspects, the (first) configuration may include a (first) set of SSB bursts for the transition period may indicate one or more of a frequency associated with transmitted SSBs associated with the (first) configuration, an SCS associated with transmitted SSBs associated with the (first) configuration, a number of SSB bursts associated with the (first) configuration, a periodicity or time gap associated with adjacent SSB bursts or transmitted SSBs associated with the (first) configuration, a location of SSBs transmitted in each SSB burst associated with the (first) configuration (e.g., a bitmap indicating candidate SSB occasions locations for which an SSB will be transmitted), an SSB transmission power for transmitted SSBs associated with the (first) configuration, and a start time and duration of a measurement window associated with transmitted SSBs associated with the (first) configuration. The (first) set of SSBs, in some aspects, may include an increased number of SSB bursts, a reduced periodicity or a reduced time gap between adjacent SSB bursts in the compact SSB burst set, or a reduced measurement window for the plurality of SSB bursts in the compact SSB burst set (when compared to a second set of SSBs associated with the activated state of the SCell). In some aspects, the configuration may be received from one of a PCell, a PSCell, or an additional SCell. The configuration, in some aspects, may be received via a MAC-CE. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**) may transmit, and the UE **1104** may receive, messages **1118** and/or **1120** including a configuration for the transitory SSB burst set **1124** and/or **1126**.

**[0132]** At **1508**, the network may output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the (first) configuration. For example, **1508** may be performed by CU processor(s) **1712**, DU processor(s) **1732**, RU processor(s) **1742**, transceiver(s) **1746**, antenna(s) **1780**, network processor **1812**, network interface **1880**, and/or aperiodic SSB configuration component **199** of FIGS. **17** and **18**. The first set of SSBs may be output, at **1508**, for the UE to perform one or more UE operations such as AGC, cell search, RRM, RLM, beam measurement or other operations associated with RS and/or SSB measurement. In some aspects, the first set of SSBs may be configured according to any of the configurations discussed in relation to FIG. **10**. For example, the first set of SSBs from the SCell may include a first set of SSB bursts associated with a first periodicity, and at least one SSB burst in the first set of SSB bursts is identified as a first SSB burst in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE, where the second set of SSBs is associated with a second periodicity. In some aspects, the first set of SSBs may be measured during a measurement window, and the configuration for the SSBs may include an indication of a timing offset from one of a beginning or an end of the measurement window for a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. The (first) configuration for the SSBs, in some aspects, may include an indication of a timing offset from an activation time to a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. In some aspects, the first set of SSBs may be used as reference for identifying a QCL of a tracking reference signal associated with the SCell. For example, referring to FIG. **11**, the UE **1104** may (at **1122**) measure, and the network **1102** (via the first SCell **1105** and/or the second SCell **1107**) may output and/or transmit, transitory SSB burst set **1124** and/or the transitory SSB burst set **1126**.

**[0133]** At **1510**, the network may output a second configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. For example, **1510** may be performed by CU processor(s) **1712**, DU processor(s) **1732**, RU processor (s) **1742**, transceiver(s) **1746**, antenna(s) **1780**, network processor **1812**, network interface **1880**, and/or aperiodic SSB configuration component **199** of FIGS. **17** and **18**. In some aspects, the second set of SSBs may include a set of periodic SSB bursts and the second configuration may indicate at least one of: a frequency associated with the set of periodic SSB bursts, a subcarrier spacing associated with the set of periodic SSB bursts, a location of SSB occasions in each periodic SSB burst of the set of periodic SSB bursts, an SSB transmission power, and/or an indication of a timing of a first periodic SSB burst in the set of periodic SSB bursts. For example, referring to FIG. **11**, the network **1102** (via the Cell **1103**) may transmit, and the UE **1104** may receive, messages **1118** and/or **1120** including a configuration for the periodic SSBs **1128** and/or **1130**.

**[0134]** Finally, at **1512**, the network may output, during the activated time period, a second set of SSBs from the SCell based on the second configuration. For example, **1512** may be performed by CU processor(s) **1712**, DU processor (s) **1732**, RU processor(s) **1742**, transceiver(s) **1746**, antenna(s) **1780**, network processor **1812**, network interface **1880**, and/or aperiodic SSB configuration component **199** of FIGS. **17** and **18**. Referring, for example, to FIG. **11**, the UE **1104** may measure, and the network **1102** (via the first SCell **1105** and/or the second SCell **1107**) may output and/or transmit, transitory SSB burst set **1128** and/or transitory SSB burst set **1130**.

**[0135]** FIG. **16** is a diagram **1600** illustrating an example of a hardware implementation for an apparatus **1604**. The apparatus **1604** may be a UE, a component of a UE, or may implement UE functionality. In some aspects, the apparatus **1604** may include at least one cellular baseband processor **1624** (also referred to as a modem) coupled to one or more transceivers **1622** (e.g., cellular RF transceiver). The cellular baseband processor(s) **1624** may include at least one on-chip memory **1624'**. In some aspects, the apparatus **1604** may further include one or more subscriber identity modules (SIM) cards **1620** and at least one application processor **1606** coupled to a secure digital (SD) card **1608** and a screen **1610**. The application processor(s) **1606** may include on-chip memory **1606'**. In some aspects, the apparatus **1604** may further include a Bluetooth module **1612**, a WLAN module **1614**, a satellite positioning system module **1616** (e.g., GNSS module), one or more sensor modules **1618** (e.g., barometric pressure sensor/altimeter; motion sensor such as inertial measurement unit (IMU), gyroscope, and/or accelerometer(s); light detection and ranging (LIDAR), radio assisted detection and ranging (RADAR), sound navigation and ranging (SONAR), magnetometer, audio and/or other technologies used for positioning), additional memory modules **1626**, a power supply **1630**, and/or a camera **1632**. The Bluetooth module **1612**, the WLAN module **1614**, and the satellite positioning system module **1616** may include an on-chip transceiver (TRX) (or in some cases, just a receiver (RX)). The Bluetooth module **1612**, the WLAN module **1614**, and the satellite positioning system Hung

**[0136]** module **1616** may include their own dedicated antennas and/or utilize one or more antennas **1680** for communication. The cellular baseband processor(s) **1624** communicates through the transceiver(s) **1622** via the one or more antennas **1680** with the UE **104** and/or with an RU associated with a network entity **1602**. The cellular baseband processor(s) **1624** and the application processor(s) **1606** may each include a computer-readable medium/memory **1624'**,

**1606'**, respectively. The additional memory modules **1626** may also be considered a computer-readable medium/memory. Each computer-readable medium/memory **1624'**, **1606'**, **1626** may be non-transitory. The cellular baseband processor(s) **1624** and the application processor(s) **1606** are each responsible for general processing, including the execution of software stored on the computer-readable medium/memory. The software, when executed by the cellular baseband processor(s) **1624**/application processor(s) **1606**, causes the cellular baseband processor(s) **1624**/application processor(s) **1606** to perform the various functions described supra. The computer-readable medium/memory may also be used for storing data that is manipulated by the cellular baseband processor(s) **1624**/application processor (s) **1606** when executing software. The cellular baseband processor(s) **1624**/application processor(s) **1606** may be a component of the UE **350** and may include the at least one memory **360** and/or at least one of the TX processor **368**, the RX processor **356**, and the controller/processor **359**. In one configuration, the apparatus **1604** may be at least one processor chip (modem and/or application) and include just the cellular baseband processor(s) **1624** and/or the application processor(s) **1606**, and in another configuration, the apparatus **1604** may be the entire UE (e.g., see UE **350** of FIG. **3**) and include the additional modules of the apparatus **1604**.

**[0137]** As discussed supra, the aperiodic SSB configuration component **198** may be configured to receive a configuration for SSBs associated with a SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE and measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. The aperiodic SSB configuration component **198** may be within the cellular baseband processor(s) **1624**, the application processor(s) **1606**, or both the cellular baseband processor(s) **1624** and the application processor(s) **1606**. The aperiodic SSB configuration component **198** may be one or more hardware components specifically configured to carry out the stated processes/algorithm, implemented by one or more processors configured to perform the stated processes/algorithm, stored within a computer-readable medium for implementation by one or more processors, or some combination thereof. When multiple processors are implemented, the multiple processors may perform the stated processes/algorithm individually or in combination. As shown, the apparatus **1604** may include a variety of components configured for various functions. In one configuration, the apparatus **1604**, and in particular the cellular baseband processor(s) **1624** and/or the application processor(s) **1606**, may include means for receiving a configuration for SSBs associated with a SCell for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE. The apparatus **1604**, and in particular the cellular baseband processor(s) **1624** and/or the application processor(s) **1606**, may include means for measuring, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. The apparatus **1604**, and in particular the cellular baseband processor(s) **1624** and/or the application processor(s) **1606**, may include means for receiving a second configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. The apparatus **1604**, and in particular the cellular baseband processor(s) **1624** and/or the application processor(s) **1606**, may include means for measuring, during the activated time period, a second set of SSBs from the SCell based on the second configuration. The apparatus **1604**, and in particular the cellular baseband processor(s) **1624** and/or the application processor(s) **1606**, may include means for receiving a third configuration for SSBs associated with the SCell for a deactivated time period associated with the deactivated state of the SCell for the UE. The apparatus **1604**, and in particular the cellular baseband processor(s) **1624** and/or the application processor(s) **1606**, may include means for measuring, during the deactivated time period, a third set of SSBs from the SCell based on the third configuration. The apparatus **1604** may further include means for performing any of the aspects described in connection with the flowcharts in FIG. **12** or **13**, and/or performed by the UE in the communication flow of FIG. **11**. The means may be the aperiodic SSB configuration component **198** of the apparatus **1604** configured to perform the functions recited by the means. As described supra, the apparatus **1604** may include the TX processor **368**, the RX processor **356**, and the controller/processor **359**. As such, in one configuration, the means may be the TX processor **368**, the RX processor **356**, and/or the controller/processor **359** configured to perform the functions recited by the means or as described in relation to FIGS. **12** and **13**.

**[0138]** FIG. **17** is a diagram **1700** illustrating an example of a hardware implementation for a network entity **1702**. The network entity **1702** may be a BS, a component of a BS, or may implement BS functionality. The network entity **1702** may include at least one of a CU **1710**, a DU **1730**, or an RU **1740**. For example, depending on the layer functionality handled by the aperiodic SSB configuration component **199**, the network entity **1702** may include the CU **1710**; both the CU **1710** and the DU **1730**; each of the CU **1710**, the DU **1730**, and the RU **1740**; the DU **1730**; both the DU **1730** and the RU **1740**; or the RU **1740**. The CU **1710** may include at least one CU processor **1712**. The CU processor(s) **1712** may include on-chip memory **1712'**. In some aspects, the CU **1710** may further include additional memory modules **1714** and a communications interface **1718**. The CU **1710** communicates with the DU **1730** through a midhaul link, such as an F1 interface. The DU **1730** may include at least one DU processor **1732**. The DU processor(s) **1732** may include on-chip memory **1732'**. In some aspects, the DU **1730** may further include additional memory modules **1734** and a communications interface **1738**. The DU **1730** communicates with the RU **1740** through a fronthaul link. The RU **1740** may include at least one RU processor **1742**. The RU processor(s) **1742** may include on-chip memory **1742'**. In some aspects, the RU **1740** may further include additional memory modules **1744**, one or more transceivers **1746**, one or more antennas **1780**, and a communications interface **1748**. The RU **1740** communicates with the UE **104**. The on-chip memory **1712'**, **1732'**, **1742'** and the additional memory modules **1714**, **1734**, **1744** may each be considered a computer-readable medium/memory. Each computer-readable medium/memory may be non-transitory. Each of the processors **1712**, **1732**, **1742** is responsible for general processing, including the execution of software stored on the computer-readable medium/memory. The software, when executed by the corresponding processor(s) causes the processor(s) to perform the various functions described supra. The computer-readable medium/memory may also be used for storing data that is manipulated by the processor(s) when executing software.

**[0139]** As discussed supra, the aperiodic SSB configuration component **199** may be configured to output a configuration for SSBs from a SCell associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a UE, and output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. The aperiodic SSB configuration component **199** may be within one or more processors of one or more of the CU **1710**, DU **1730**, and the RU **1740**. The aperiodic SSB configuration component **199** may be one or more hardware components specifically configured to carry out the stated processes/algorithm, implemented by one or more processors configured to perform the stated processes/algorithm, stored within a computer-readable medium for implementation by one or more processors, or some combination thereof. When multiple processors are implemented, the multiple processors may perform the stated processes/algorithm individually or in combination. The network entity **1702** may include a variety of components configured for various functions. In one configuration, the network entity **1702** may include means for outputting a configuration for SSBs from a SCell associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a UE. The network entity **1702** may include means for outputting, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. The network entity **1702** may include means for outputting a second configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. The network entity **1702** may include means for outputting, during the activated time period, a second set of SSBs from the SCell based on the second configuration. The network entity **1702** may include means for outputting a third configuration for SSBs associated with the SCell for a deactivated time period associated with the deactivated state of the SCell for the UE. The network entity **1702** may include means for outputting, during the deactivated time period, a third set of SSBs from the SCell based on the third configuration. The network entity **1702** may further include means for performing any of the aspects described in connection with the flowcharts in FIG. **14** or **15**, and/or performed by the network or cell in the communication flow of FIG. **11**. The means may be the aperiodic SSB configuration component **199** of the network entity **1702** configured to perform the functions recited by the means. As described supra, the network entity **1702** may include the TX processor **316**, the RX processor **370**, and the controller/processor **375**. As such, in one configuration, the means may be the TX processor **316**, the RX processor **370**, and/or the controller/processor **375** configured to perform the functions recited by the means or as described in relation to FIGS. **14** and **15**.

**[0140]** FIG. **18** is a diagram **1800** illustrating an example of a hardware implementation for a network entity **1860**. In one example, the network entity **1860** may be within the core network **120**. The network entity **1860** may include at least one network processor **1812**. The network processor(s) **1812** may include on-chip memory **1812'**. In some aspects, the network entity **1860** may further include additional memory modules **1814**. The network entity **1860** communicates via the network interface **1880** directly (e.g., backhaul link) or indirectly (e.g., through a RIC) with the CU **1802**. The on-chip memory **1812'** and the additional memory modules **1814** may each be considered a computer-readable medium/memory. Each computer-readable medium/memory may be non-transitory. The network processor(s) **1812** is responsible for general processing, including the execution of software stored on the computer-readable medium/memory. The software, when executed by the corresponding processor(s) causes the processor(s) to perform the various functions described supra. The computer-readable medium/memory may also be used for storing data that is manipulated by the processor(s) when executing software.

**[0141]** As discussed supra, the aperiodic SSB configuration component **199** may be configured to output a configuration for SSBs from a SCell associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a UE, and output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. The aperiodic SSB configuration component **199** may be within the network processor(s) **1812**. The aperiodic SSB configuration component **199** may be one or more hardware components specifically configured to carry out the stated processes/algorithm, implemented by one or more processors configured to perform the stated processes/algorithm, stored within a computer-readable medium for implementation by one or more processors, or some combination thereof. When multiple processors are implemented, the multiple processors may perform the stated processes/algorithm individually or in combination. The network entity **1860** may include a variety of components configured for various functions. In one configuration, the network entity **1860** may include means for outputting a configuration for SSBs from a SCell associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a UE. The network entity **1860** may include means for outputting, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration. The network entity **1860** may include means for outputting a second configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE. The network entity **1860** may include means for outputting, during the activated time period, a second set of SSBs from the SCell based on the second configuration. The network entity **1860** may include means for outputting a third configuration for SSBs associated with the SCell for a deactivated time period associated with the deactivated state of the SCell for the UE. The network entity **1860** may include means for outputting, during the deactivated time period, a third set of SSBs from the SCell based on the third configuration. The network entity **1860** may further include means for performing any of the aspects described in connection with the flowcharts in FIG. **14** or **15**, and/or performed by the network or cell in the communication flow of FIG. **11**. The means may be the aperiodic SSB configuration component **199** of the network entity **1860** configured to perform the functions recited by the means or as described in relation to FIGS. **14** and **15**.

**[0142]** Various aspects relate generally to indicating a configuration of at least aperiodic (e.g., not having a period associated with SSBs transmitted during an activated SCell state) and/or periodic SSBs associated with a transition from a deactivated state of an SCell to an activated state of the SCell. Some aspects relate specifically to indicating the configuration via a medium access control (MAC) control element (CE) (MAC-CE) instead of via radio resource control (RRC) configuration to configure a set of SSBs associated with the transition from the deactivated state of an SCell to the activated state of the SCell. In some examples, a UE may be configured to. In some aspects, a network (e.g., a PCell, a primary SCell (PSCell), or an activated SCell) may be configured to.

**[0143]** Particular aspects of the subject matter described in this disclosure can be implemented to realize one or more of the following potential advantages. In some examples, by configuring a set of SSBs associated with a transition from a deactivated state of an SCell to an activated state of the SCell, the described techniques can be used to reduce a latency associated with the transition and/or the activation of the SCell.

**[0144]** It is understood that the specific order or hierarchy of blocks in the processes/flowcharts disclosed is an illustration of example approaches. Based upon design preferences, it is understood that the specific order or hierarchy of blocks in the processes/flowcharts may be rearranged. Further, some blocks may be combined or omitted. The accompanying method claims present elements of the various blocks in a sample order, and are not limited to the specific order or hierarchy presented.

**[0145]** The previous description is provided to enable any person skilled in the art to practice the various aspects described herein. Various modifications to these aspects will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other aspects. Thus, the claims are not limited to the aspects described herein, but are to be accorded the full scope consistent with the language claims. Reference to an element in the singular does not mean "one and only one" unless specifically so stated, but rather "one or more." Terms such as "if," "when," and "while" do not imply an immediate temporal relationship or reaction. That is, these phrases, e.g., "when," do not imply an immediate action in response to or during the occurrence of an action, but simply imply that if a condition is met then an action will occur, but without requiring a specific or immediate time constraint for the action to occur. The word "exemplary" is used herein to mean "serving as an example, instance, or illustration." Any aspect described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over other aspects. Unless specifically stated otherwise, the term "some" refers to one or more. Combinations such as "at least one of A, B, or C," "one or more of A, B, or C," "at least one of A, B, and C," "one or more of A, B, and C," and "A, B, C, or any combination thereof" include any combination of A, B, and/or C, and may include multiples of A, multiples of B, or multiples of C. Specifically, combinations such as "at least one of A, B, or C," "one or more of A, B, or C," "at least one of A, B, and C," "one or more of A, B, and C," and "A, B, C, or any combination thereof" may be A only, B only, C only, A and B, A and C, B and C, or A and B and C, where any such combinations may contain one or more member or members of A, B, or C. Sets should be interpreted as a set of elements where the elements number one or more. Accordingly, for a set of X, X would include one or more elements. When at least one processor is configured to perform a set of functions, the at least one processor, individually or in any combination, is configured to perform the set of functions. Accordingly, each processor of the at least one processor may be configured to perform a particular subset of the set of functions, where the subset is the full set, a proper subset of the set, or an empty subset of the set. A processor may be referred to as processor circuitry. A memory/memory module may be referred to as memory circuitry. If a first apparatus receives data from or transmits data to a second apparatus, the data may be received/transmitted directly between the first and second apparatuses, or indirectly between the first and second apparatuses through a set of apparatuses. A device configured to "output" data, such as a transmission, signal, or message, may transmit the data, for example with a transceiver, or may send the data to a device that transmits the data. A device configured to "obtain" data, such as a transmission, signal, or message, may receive, for example with a transceiver, or may obtain the data from a device that receives the data. Information stored in a memory includes instructions and/or data. All structural and functional equivalents to the elements of the various aspects described throughout this disclosure that are known or later come to be known to those of ordinary skill in the art are expressly incorporated herein by reference and are encompassed by the claims. Moreover, nothing disclosed herein is dedicated to the public regardless of whether such disclosure is explicitly recited in the claims. The words "module," "mechanism," "element," "device," and the like may not be a substitute for the word "means." As such, no claim element is to be construed as a means plus function unless the element is expressly recited using the phrase "means for."

**[0146]** As used herein, the phrase "based on" shall not be construed as a reference to a closed set of information, one or more conditions, one or more factors, or the like. In other words, the phrase "based on A" (where "A" may be information, a condition, a factor, or the like) shall be construed as "based at least on A" unless specifically recited differently.

**[0147]** The following aspects are illustrative only and may be combined with other aspects or teachings described herein, without limitation.

**[0148]** Aspect 1 is a method of wireless communication at a user equipment (UE), comprising: receiving a configuration for synchronization signal blocks (SSBs) associated with a secondary cell (SCell) for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE; and measuring, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration.

**[0149]** Aspect 2 is the method of aspect 1, wherein the first set of SSBs comprises a plurality of SSB bursts and the configuration indicates at least one of: a frequency associated with the plurality of SSB bursts; a subcarrier spacing associated with the plurality of SSB bursts; a number of SSB bursts in the plurality of SSB bursts; a periodicity or time gap associated with adjacent SSB bursts in the plurality of SSB bursts; a location of SSBs transmitted in each SSB burst in the plurality of SSB bursts; an SSB transmission power; and a start time and duration of a measurement window associated with the plurality of SSB bursts.

**[0150]** Aspect 3 is the method of aspect 2, wherein the first set of SSBs includes a compact SSB burst set including at least one of: an increased number of SSB bursts, a reduced periodicity or a reduced time gap between adjacent SSB bursts in the compact SSB burst set, or a reduced measurement window for the plurality of SSB bursts in the compact SSB burst set.

**[0151]** Aspect 4 is the method of any of aspects 1 to 3, wherein the configuration is a first configuration, the method further comprising: receiving a second configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE; and measuring, during the activated time period, a second set of SSBs from the SCell based on the second configuration.

**[0152]** Aspect 5 is the method of aspect 4, wherein the second set of SSBs comprises a set of periodic SSB bursts and the configuration indicates at least one of: a frequency associated with the set of periodic SSB bursts; a subcarrier spacing associated with the set of periodic SSB bursts; a location of SSB occasions in each periodic SSB burst of the set of periodic SSB bursts; and an indication of a timing of a first periodic SSB burst in the set of periodic SSB bursts.

**[0153]** Aspect 6 is the method of aspect 4, further comprising: receiving a third configuration for SSBs associated with the SCell for a deactivated time period associated with the deactivated state of the SCell for the UE; and measuring, during the deactivated time period, a third set of SSBs from the SCell based on the third configuration.

**[0154]** Aspect 7 is the method of any of aspects 1 to 3, wherein the configuration further configures at least one of: a second set of SSBs associated with an activated time period associated with the activated state of the SCell, or a third set of SSBs associated with a deactivated time period associated with the deactivated state of the SCell.

**[0155]** Aspect 8 is the method of any of aspects 1 to 7, wherein the first set of SSBs from the SCell comprise a first set of SSB bursts associated with a first periodicity, wherein at least one SSB burst in the first set of SSB bursts is identified as a first SSB burst in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE, wherein the second set of SSBs is associated with a second periodicity.

**[0156]** Aspect 9 is the method of any of aspects 1 to 7, wherein the first set of SSBs is measured during a measurement window, and the configuration for the SSBs comprises an indication of a timing offset from an end of the measurement window for a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE.

**[0157]** Aspect 10 is the method of any of aspects 1 to 7, wherein the configuration for the SSBs comprises an indication of a timing offset from an activation time to a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE.

**[0158]** Aspect 11 is the method of any of aspects 1 to 10, wherein the first set of SSBs are used as reference for identifying a quasi-co-location (QCL) of a tracking reference signal associated with the SCell.

**[0159]** Aspect 12 is the method of any of aspects 1 to 11, wherein the configuration is received from one of a primary cell (PCell), a primary SCell (PSCell), or an additional SCell.

**[0160]** Aspect 13 is the method of any of aspects 1 to 12, wherein the configuration is received via one or more of a medium access control (MAC) control element (CE) (MAC-CE) or downlink control information (DCI).

**[0161]** Aspect 14 is a method of wireless communication at a network device, comprising: outputting a configuration for synchronization signal blocks (SSBs) from a secondary cell (SCell) associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a user equipment (UE); and outputting, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration.

**[0162]** Aspect 15 is the method of any of aspect 14, wherein the first set of SSBs comprises a plurality of SSB bursts and the configuration indicates at least one of: a frequency associated with the plurality of SSB bursts; a subcarrier spacing associated with the plurality of SSB bursts; a number of SSB bursts in the plurality of SSB bursts; a periodicity or time gap associated with adjacent SSB bursts in the plurality of SSB bursts; a location of SSB occasions in each SSB in the plurality of SSB bursts; and a start time and duration of a measurement window associated with the plurality of SSB bursts.

**[0163]** Aspect 16 is the method of any of aspect 15, wherein the first set of SSBs includes a compact SSB burst set including at least one of: an increased number of SSB bursts, a reduced periodicity or a reduced time gap between adjacent SSB bursts in the compact SSB burst set, or a reduced measurement window for the plurality of SSB bursts in the compact SSB burst set.

**[0164]** Aspect 17 is the method of any of aspects 14 to 16, wherein the configuration is a first configuration, the method further comprising: outputting a second configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE; and outputting, during the activated time period, a second set of SSBs from the SCell based on the second configuration.

**[0165]** Aspect 18 is the method of any of aspect 17, wherein the second set of SSBs comprises a set of periodic SSB bursts and the configuration indicates at least one of: a frequency associated with the set of periodic SSB bursts; a subcarrier spacing associated with the set of periodic SSB bursts; a number of SSB occasions in each periodic SSB burst of the set of periodic SSB bursts; and an indication of a timing of a first periodic SSB burst in the set of periodic SSB bursts.

**[0166]** Aspect 19 is the method of any of aspect 17, further comprising: outputting a third configuration for SSBs associated with the SCell for a deactivated time period associated with the deactivated state of the SCell for the UE; and outputting, during the deactivated time period, a third set of SSBs from the SCell based on the third configuration.

**[0167]** Aspect 20 is the method of any of aspects 14 to 16, wherein the configuration further configures at least one of: a second set of SSBs associated with an activated time period associated with the activated state of the SCell, or a third set of SSBs associated with a deactivated time period associated with the deactivated state of the SCell.

**[0168]** Aspect 21 is the method of any of aspects 14 to 20, wherein the first set of SSBs from the SCell comprise a first set of SSB bursts associated with a first periodicity, wherein at least one SSB burst in the first set of SSB bursts is identified as a first SSB burst in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE, wherein the second set of SSBs is associated with a second periodicity.

**[0169]** Aspect 22 is the method of any of aspects 14 to 20, wherein the first set of SSBs is measured during a measurement window, and the configuration for the SSBs comprises an indication of a timing offset from an end of the measurement window for a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE.

**[0170]** Aspect 23 is the method of any of aspects 14 to 20, wherein the configuration for the SSBs comprises an indication of a timing offset from an activation time to a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE.

**[0171]** Aspect 24 is the method of any of aspects 14 to 23, wherein the configuration indicates to use the first set of SSBs as reference for identifying a quasi-co-location (QCL) of a tracking reference signal associated with the SCell.

**[0172]** Aspect 25 is the method of any of aspects 14 to 24, wherein the configuration is output via one of a primary cell (PCell), a primary SCell (PSCell), or an additional SCell.

**[0173]** Aspect 26 is the method of any of aspects 14 to 25, wherein the configuration is output via a medium access control (MAC) control element (CE) (MAC-CE).

**[0174]** Aspect 27 is an apparatus for wireless communication at a device including a memory and at least one processor coupled to the memory and, based at least in part on information stored in the memory, the at least one processor is configured to implement any of aspects 1 to 13.

**[0175]** Aspect 28 is the apparatus of aspect 27, further including a transceiver or an antenna coupled to the at least one processor.

**[0176]** Aspect 29 is an apparatus for wireless communication at a device including means for implementing any of aspects 1 to 13.

**[0177]** Aspect 30 is a computer-readable medium (e.g., a non-transitory computer-readable medium) storing computer executable code, where the code when executed by a processor causes the processor to implement any of aspects 1 to 13.

**[0178]** Aspect 31 is an apparatus for wireless communication at a device including a memory and at least one processor coupled to the memory and, based at least in part on information stored in the memory, the at least one processor is configured to implement any of aspects 14 to 26.

**[0179]** Aspect 32 is the apparatus of aspect 31, further including a transceiver or an antenna coupled to the at least one processor.

**[0180]** Aspect 33 is an apparatus for wireless communication at a device including means for implementing any of aspects 14 to 26.

**[0181]** Aspect 34 is a computer-readable medium (e.g., a non-transitory computer-readable medium) storing computer executable code, where the code when executed by a processor causes the processor to implement any of aspects 14 to 26.

What is claimed is:

**1**. An apparatus for wireless communication at a user equipment (UE), comprising:

at least one memory; and

at least one processor coupled to the at least one memory and, based at least in part on stored information that is stored in the at least one memory, the at least one processor, individually or in any combination, is configured to:

receive a configuration for synchronization signal blocks (SSBs) associated with a secondary cell (SCell) for a transition period associated with a transition from a deactivated state of the SCell to an activated state of the SCell for the UE; and

measure, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration.

**2**. The apparatus of claim **1**, wherein the first set of SSBs comprises a plurality of SSB bursts and the configuration indicates at least one of:

a frequency associated with the plurality of SSB bursts;

a subcarrier spacing associated with the plurality of SSB bursts;

a number of SSB bursts in the plurality of SSB bursts;

a periodicity or time gap associated with adjacent SSB bursts in the plurality of SSB bursts;

a location of SSBs transmitted in each SSB burst in the plurality of SSB bursts;

an SSB transmission power; and

a start time and duration of a measurement window associated with the plurality of SSB bursts.

**3**. The apparatus of claim **1**, wherein the configuration is a first configuration, and wherein the at least one processor, individually or in any combination, is further configured to:

receive a second configuration for SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE; and

measure, during the activated time period, a second set of SSBs from the SCell based on the second configuration.

**4**. The apparatus of claim **3**, wherein the second set of SSBs comprises a set of periodic SSB bursts and the configuration indicates at least one of:

a frequency associated with the set of periodic SSB bursts;

a subcarrier spacing associated with the set of periodic SSB bursts;

a location of SSB occasions in each periodic SSB burst of the set of periodic SSB bursts; and

an indication of a timing of a first periodic SSB burst in the set of periodic SSB bursts.

**5**. The apparatus of claim **3**, wherein the at least one processor, individually or in any combination, is further configured to:

receive a third configuration for SSBs associated with the SCell for a deactivated time period associated with the deactivated state of the SCell for the UE; and measure, during the deactivated time period, a third set of SSBs from the SCell based on the third configuration, or

skip measurement of the SSBs, during the deactivated time period, based on the third configuration indicating an absence of the SSBs during the deactivated time period.

**6**. The apparatus of claim **1**, wherein the configuration further configures at least one of:

a second set of SSBs for an activated time period associated with the activated state of the SCell,

a third set of SSBs for a deactivated time period associated with the deactivated state of the SCell, or

an absence of SSBs for the deactivated time period associated with the deactivated state of the SCell.

**7**. The apparatus of claim **1**, wherein the first set of SSBs from the SCell comprise a first set of SSB bursts associated with a first periodicity, wherein at least one SSB burst in the first set of SSB bursts is identified as a first SSB burst in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE, wherein the second set of SSBs is associated with a second periodicity.

**8**. The apparatus of claim **1**, wherein the first set of SSBs is measured during a measurement window, and the configuration for the SSBs comprises an indication of a timing offset from an end of the measurement window for a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE.

**9**. The apparatus of claim **1**, wherein the configuration for the SSBs comprises an indication of a timing offset from an activation time to a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE.

**10**. The apparatus of claim **1**, wherein the first set of SSBs are used as reference for identifying a quasi-co-location (QCL) of a tracking reference signal associated with the SCell.

**11**. The apparatus of claim **1**, wherein the configuration is received from one of a primary cell (PCell), a primary SCell (PSCell), or an additional SCell.

**12**. The apparatus of claim **1**, further comprising a transceiver coupled to the at least one processor, the transceiver being configured to receive the configuration via one or more of a medium access control (MAC) control element (CE) (MAC-CE) or downlink control information (DCI).

**13**. The apparatus of claim **1**, wherein when cell discontinuous transmission (DTX) is configured, the at least one processor, individually or in any combination, is configured to:

measure aperiodic SSB transmissions and periodic SSB transmissions during a non-active period of the cell DTX,

skip measurement of the aperiodic SSB transmissions and the periodic SSB transmissions during the non-active period of the cell DTX, or

skip measurement of the periodic SSB transmissions and measure the aperiodic SSB transmissions during the non-active period of the cell DTX.

**14**. An apparatus for wireless communication at a network device, comprising:

at least one memory; and

at least one processor coupled to the at least one memory and, based at least in part on stored information that is stored in the at least one memory, the at least one processor, individually or in any combination, is configured to:

output a configuration for synchronization signal blocks (SSBs) from a secondary cell (SCell) associated with a transition period from a deactivated state of the SCell to an activated state of the SCell for a user equipment (UE); and

output, during the transition period associated with an activation of the SCell for the UE, a first set of SSBs from the SCell based on the configuration.

**15**. The apparatus of claim **14**, wherein the first set of SSBs comprises a plurality of SSB bursts and the configuration indicates at least one of:

a frequency associated with the plurality of SSB bursts;

a subcarrier spacing associated with the plurality of SSB bursts;

a number of SSB bursts in the plurality of SSB bursts;

a periodicity or time gap associated with adjacent SSB bursts in the plurality of SSB bursts;

a location of SSB occasions in each SSB in the plurality of SSB bursts; and

a start time and duration of a measurement window associated with the plurality of SSB bursts.

**16**. The apparatus of claim **14**, wherein the first set of SSBs from the SCell comprise a first set of SSB bursts associated with a first periodicity, wherein at least one SSB burst in the first set of SSB bursts is identified as a first SSB burst in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE, wherein the second set of SSBs is associated with a second periodicity.

**17**. The apparatus of claim **14**, wherein the first set of SSBs is measured during a measurement window, and the configuration for the SSBs comprises an indication of a timing offset from an end of the measurement window for a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE.

**18**. The apparatus of claim **14**, wherein the configuration for the SSBs comprises an indication of a timing offset from an activation time to a first SSB in a second set of SSBs associated with the SCell for an activated time period associated with the activated state of the SCell for the UE.

**19**. The apparatus of claim **14**, further comprising a transceiver coupled to the at least one processor, the transceiver being configured to output the configuration via a medium access control (MAC) control element (CE) (MAC-CE).

**20**. The apparatus of claim **14**, wherein when cell discontinuous transmission (DTX) is configured, the at least one processor, individually or in any combination, is configured to:

transmit aperiodic SSB transmissions and periodic SSB transmissions during a non-active period of the cell DTX,

skip transmission of the aperiodic SSB transmissions and the periodic SSB transmissions during the non-active period of the cell DTX, or skip transmission of the periodic SSB transmissions and transmit the aperiodic SSB transmissions during the non-active period of the cell DTX.

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