

CLAIMS

What is claimed is:

- 1 **1.** A method for wireless communication, comprising:
2 identifying a tone spacing scheme that includes different tone spacings for
3 wireless communications within a wireless network, the tone spacing scheme indicating
4 different tone spacings for uplink communications, downlink communications, sidelink
5 communications, or combinations thereof; and
6 communicating with a wireless device according to the identified tone spacing
7 scheme.
- 1 **2.** The method of claim 1, further comprising:
2 selecting the tone spacing scheme from a plurality of available tone spacing
3 schemes.
- 1 **3.** The method of claim 1, wherein communicating with the wireless
2 device comprises:
3 using one or more different tone spacings for each stage of different stages of
4 wireless communications in accordance with the identified tone spacing scheme.
- 1 **4.** The method of claim 3, wherein communicating with the wireless
2 device comprises:
3 participating in a random access channel (RACH) procedure with the wireless
4 device in accordance with the identified tone spacing scheme, wherein a tone spacing for the
5 RACH procedure is different from a tone spacing for other stages of communication with the
6 wireless device.
- 1 **5.** The method of claim 3, wherein communicating with the wireless
2 device comprises:
3 participating in data communications with the wireless device in accordance
4 with the identified tone spacing scheme, wherein a tone spacing for the data communications
5 is different from a tone spacing for other stages of communication with the wireless device.
- 1 **6.** The method of claim 1, wherein communicating with the wireless
2 device comprises:

3 communicating with the wireless device using one or more different tone
4 spacings for each type of different wireless communication channel types in accordance with
5 the identified tone spacing scheme.

1 **7.** The method of claim 6, wherein communicating with the wireless
2 device comprises:
3 communicating via one or more control channels with the wireless device in
4 accordance with the identified tone spacing scheme, wherein a tone spacing for the one or
5 more control channels is different from a tone spacing for other types of communication with
6 the wireless device.

1 **8.** The method of claim 1, wherein:
2 the tone spacing of at least one synchronization signal is different from other
3 channels of communication.

1 **9.** The method of claim 8, wherein:
2 the at least one synchronization signal comprises a primary synchronization
3 signal (PSS), a secondary synchronization signal (SSS), a physical broadcast channel
4 (PBCH), or combinations thereof.

1 **10.** The method of claim 8, wherein:
2 the tone spacing of the at least one synchronization signal is different from at
3 least one other synchronization signal.

1 **11.** The method of claim 1, wherein communicating with the wireless
2 device comprises:
3 including an indication of the identified tone spacing scheme via a
4 synchronization channel, a control channel a physical broadcast channel (PBCH), a radio
5 resource control (RRC) message, master information block, a system information block, or
6 combinations thereof.

1 **12.** The method of claim 11, wherein:
2 the system information block comprises minimum system information or other
3 system information.

- 1 **13.** The method of claim 1, wherein communicating with the wireless
2 device comprises:
3 indicating the identified tone spacing scheme via a characteristic of a primary
4 synchronization signal (PSS), a secondary synchronization signal (SSS), a reference signal, or
5 combinations thereof.
- 1 **14.** The method of claim 13, wherein the characteristic comprises a
2 number of repetitions, a number of tones, a pattern of tones, or combinations thereof.
- 1 **15.** The method of claim 1, wherein communicating with the wireless
2 device comprises:
3 indicating the identified tone spacing scheme for either a current subframe or a
4 future subframe.
- 1 **16.** A method for wireless communication, comprising:
2 identifying a tone spacing scheme that includes different tone spacings for
3 wireless communications within a wireless network, the tone spacing scheme indicating tone
4 spacing for a current subframe, a future subframe, or a combination thereof; and
5 communicating with a wireless device according to the identified tone spacing
6 scheme.
- 1 **17.** The method of claim 16, further comprising:
2 selecting the tone spacing scheme from a plurality of available tone spacing
3 schemes.
- 1 **18.** The method of claim 16, wherein communicating with the wireless
2 device comprises:
3 using one or more different tone spacings for each stage of different stages of
4 wireless communications in accordance with the identified tone spacing scheme.
- 1 **19.** The method of claim 18, wherein communicating with the wireless
2 device comprises:
3 participating in a random access channel (RACH) procedure with the wireless
4 device in accordance with the identified tone spacing scheme, wherein a tone spacing for the

5 RACH procedure is different from a tone spacing for other stages of communication with the
6 wireless device.

1 **20.** The method of claim 18, wherein communicating with the wireless
2 device comprises:
3 participating in data communications with the wireless device in accordance
4 with the identified tone spacing scheme, wherein a tone spacing for the data communications
5 is different from a tone spacing for other stages of communication with the wireless device.

1 **21.** The method of claim 16, wherein communicating with the wireless
2 device comprises:
3 communicating with the wireless device using one or more different tone
4 spacings for each type of different wireless communication channel types in accordance with
5 the identified tone spacing scheme.

1 **22.** The method of claim 21, wherein communicating with the wireless
2 device comprises:
3 communicating via one or more control channels with the wireless device in
4 accordance with the identified tone spacing scheme, wherein a tone spacing for the one or
5 more control channels is different from a tone spacing for other types of communication with
6 the wireless device.

1 **23.** The method of claim 16, wherein communicating with the wireless
2 device comprises:
3 including an indication of the identified tone spacing scheme via a
4 synchronization channel, a control channel a physical broadcast channel (PBCH), a radio
5 resource control (RRC) message, or a system information block (SIB).

1 **24.** The method of claim 16, wherein communicating with the wireless
2 device comprises:
3 indicating the identified tone spacing scheme via a characteristic of a primary
4 synchronization signal (PSS), a secondary synchronization signal (SSS), or a reference signal.

1 **25.** The method of claim 16, wherein communicating with the wireless
2 device comprises:

3 indicating the identified tone spacing scheme for either an uplink
4 communication, a downlink communication, or a sidelink communication.

1 **26.** An apparatus for wireless communication, in a system comprising:
2 a processor;
3 memory in electronic communication with the processor; and
4 instructions stored in the memory and operable, when executed by the
5 processor, to cause the apparatus to:
6 identify a tone spacing scheme that includes different tone spacings for
7 wireless communications within a wireless network, the tone spacing scheme indicating
8 different tone spacings for uplink communications, downlink communications, sidelink
9 communications, or combinations thereof; and
10 communicate with a wireless device according to the identified tone spacing
11 scheme.

1 **27.** The apparatus of claim 26, wherein the instructions are further
2 executable by the processor to:
3 select the tone spacing scheme from a plurality of available tone spacing
4 schemes.

1 **28.** The apparatus of claim 26, wherein the instructions are further
2 executable by the processor to:
3 use one or more different tone spacings for each stage of different stages of
4 wireless communications in accordance with the identified tone spacing scheme.

1 **29.** The apparatus of claim 28, wherein the instructions are further
2 executable by the processor to:
3 participate in a random access channel (RACH) procedure with the wireless
4 device in accordance with the identified tone spacing scheme, wherein a tone spacing for the
5 RACH procedure is different from a tone spacing for other stages of communication with the
6 wireless device.

1 **30.** The apparatus of claim 28, wherein the instructions are further
2 executable by the processor to:

3 participate in data communications with the wireless device in accordance
4 with the identified tone spacing scheme, wherein a tone spacing for the data communications
5 is different from a tone spacing for other stages of communication with the wireless device.

1 **31.** The apparatus of claim 26, wherein the instructions are further
2 executable by the processor to:
3 communicate with the wireless device using one or more different tone
4 spacings for each type of different wireless communication channel types in accordance with
5 the identified tone spacing scheme.

1 **32.** The apparatus of claim 31, wherein the instructions are further
2 executable by the processor to:
3 communicate via one or more control channels with the wireless device in
4 accordance with the identified tone spacing scheme, wherein a tone spacing for the one or
5 more control channels is different from a tone spacing for other types of communication with
6 the wireless device.

1 **33.** The apparatus of claim 26, wherein:
2 the tone spacing of at least one synchronization signal is different from other
3 channels of communication.

1 **34.** The apparatus of claim 33, wherein:
2 the at least one synchronization signal comprises a primary synchronization
3 signal (PSS), a secondary synchronization signal (SSS), a physical broadcast channel
4 (PBCH), or combinations thereof.

1 **35.** The apparatus of claim 33, wherein:
2 the tone spacing of the at least one synchronization signal is different from at
3 least one other synchronization signal.

1 **36.** The apparatus of claim 26, wherein the instructions are further
2 executable by the processor to:
3 include an indication of the identified tone spacing scheme via a
4 synchronization channel, a control channel a physical broadcast channel (PBCH), a radio
5 resource control (RRC) message, master information block, a system information block, or
6 combinations thereof.

1 **37.** The apparatus of claim 36, wherein:
2 the system information block comprises minimum system information or other
3 system information.

1 **38.** The apparatus of claim 26, wherein the instructions are further
2 executable by the processor to:
3 indicate the identified tone spacing scheme via a characteristic of a primary
4 synchronization signal (PSS), a secondary synchronization signal (SSS), a reference signal, or
5 combinations thereof.

1 **39.** The apparatus of claim 38, wherein
2 the characteristic comprises a number of repetitions, a number of tones, a
3 pattern of tones, or combinations thereof.

1 **40.** The apparatus of claim 26, wherein the instructions are further
2 executable by the processor to:
3 indicate the identified tone spacing scheme for either a current subframe or a
4 future subframe.

1 **41.** An apparatus for wireless communication, in a system comprising:
2 a processor;
3 memory in electronic communication with the processor; and
4 instructions stored in the memory and operable, when executed by the
5 processor, to cause the apparatus to:
6 identify a tone spacing scheme that includes different tone spacings for
7 wireless communications within a wireless network, the tone spacing scheme indicating tone
8 spacing for a current subframe, a future subframe, or a combination thereof; and
9 communicate with a wireless device according to the identified tone spacing
10 scheme.

1 **42.** The apparatus of claim 41, wherein the instructions are further
2 executable by the processor to:
3 select the tone spacing scheme from a plurality of available tone spacing
4 schemes.

1 **43.** The apparatus of claim 41, wherein the instructions are further
2 executable by the processor to:
3 use one or more different tone spacings for each stage of different stages of
4 wireless communications in accordance with the identified tone spacing scheme.

1 **44.** The apparatus of claim 43, wherein the instructions are further
2 executable by the processor to:
3 participate in a random access channel (RACH) procedure with the wireless
4 device in accordance with the identified tone spacing scheme, wherein a tone spacing for the
5 RACH procedure is different from a tone spacing for other stages of communication with the
6 wireless device.

1 **45.** The apparatus of claim 43, wherein the instructions are further
2 executable by the processor to:
3 participate in data communications with the wireless device in accordance
4 with the identified tone spacing scheme, wherein a tone spacing for the data communications
5 is different from a tone spacing for other stages of communication with the wireless device.

1 **46.** The apparatus of claim 41, wherein the instructions are further
2 executable by the processor to:
3 communicate with the wireless device using one or more different tone
4 spacings for each type of different wireless communication channel types in accordance with
5 the identified tone spacing scheme.

1 **47.** The apparatus of claim 46, wherein the instructions are further
2 executable by the processor to:
3 communicate via one or more control channels with the wireless device in
4 accordance with the identified tone spacing scheme, wherein a tone spacing for the one or
5 more control channels is different from a tone spacing for other types of communication with
6 the wireless device.

1 **48.** The apparatus of claim 41, wherein the instructions are further
2 executable by the processor to:

3 include an indication of the identified tone spacing scheme via a
4 synchronization channel, a control channel a physical broadcast channel (PBCH), a radio
5 resource control (RRC) message, or a system information block (SIB).

1 **49.** The apparatus of claim 41, wherein the instructions are further
2 executable by the processor to:
3 indicate the identified tone spacing scheme via a characteristic of a primary
4 synchronization signal (PSS), a secondary synchronization signal (SSS), or a reference signal.

1 **50.** The apparatus of claim 41, wherein the instructions are further
2 executable by the processor to:
3 indicate the identified tone spacing scheme for either an uplink
4 communication, a downlink communication, or a sidelink communication.

1 **51.** An apparatus for wireless communication, comprising:
2 means for identifying a tone spacing scheme that includes different tone
3 spacings for wireless communications within a wireless network, the tone spacing scheme
4 indicating different tone spacings for uplink communications, downlink communications,
5 sidelink communications, or combinations thereof; and
6 means for communicating with a wireless device according to the identified
7 tone spacing scheme.

1 **52.** The apparatus of claim 51, further comprising:
2 means for selecting the tone spacing scheme from a plurality of available tone
3 spacing schemes.

1 **53.** The apparatus of claim 51, wherein the means for communicating with
2 the wireless device comprises:
3 means for using one or more different tone spacings for each stage of different
4 stages of wireless communications in accordance with the identified tone spacing scheme.

1 **54.** The apparatus of claim **53**, wherein the means for communicating with
2 the wireless device comprises:
3 means for participating in a random access channel (RACH) procedure with
4 the wireless device in accordance with the identified tone spacing scheme, wherein a tone

5 spacing for the RACH procedure is different from a tone spacing for other stages of
6 communication with the wireless device.

1 **55.** The apparatus of claim **53**, wherein the means for communicating with
2 the wireless device comprises:

3 means for participating in data communications with the wireless device in
4 accordance with the identified tone spacing scheme, wherein a tone spacing for the data
5 communications is different from a tone spacing for other stages of communication with the
6 wireless device.

1 **56.** The apparatus of claim 51, wherein the means for communicating with
2 the wireless device comprises:

3 means for communicating with the wireless device using one or more different
4 tone spacings for each type of different wireless communication channel types in accordance
5 with the identified tone spacing scheme.

1 **57.** The apparatus of claim **56**, wherein the means for communicating with
2 the wireless device comprises:

3 means for communicating via one or more control channels with the wireless
4 device in accordance with the identified tone spacing scheme, wherein a tone spacing for the
5 one or more control channels is different from a tone spacing for other types of
6 communication with the wireless device.

1 **58.** The apparatus of claim 51, wherein:
2 the tone spacing of at least one synchronization signal is different from other
3 channels of communication.

1 **59.** The apparatus of claim **58**, wherein:
2 the at least one synchronization signal comprises a primary synchronization
3 signal (PSS), a secondary synchronization signal (SSS), a physical broadcast channel
4 (PBCH), or combinations thereof.

1 **60.** The apparatus of claim **58**, wherein:
2 the tone spacing of the at least one synchronization signal is different from at
3 least one other synchronization signal.

1 **61.** The apparatus of claim 51, wherein the means for communicating with
2 the wireless device comprises:

3 means for including an indication of the identified tone spacing scheme via a
4 synchronization channel, a control channel a physical broadcast channel (PBCH), a radio
5 resource control (RRC) message, master information block, a system information block, or
6 combinations thereof.

1 **62.** The apparatus of claim **61**, wherein:
2 the system information block comprises minimum system information or other
3 system information.

1 **63.** The apparatus of claim 51, wherein the means for communicating with
2 the wireless device comprises:

3 means for indicating the identified tone spacing scheme via a characteristic of
4 a primary synchronization signal (PSS), a secondary synchronization signal (SSS), a
5 reference signal, or combinations thereof.

1 **64.** The apparatus of claim **63**, wherein the characteristic comprises a
2 number of repetitions, a number of tones, a pattern of tones, or combinations thereof.

1 **65.** The apparatus of claim 51, wherein the means for communicating with
2 the wireless device comprises:

3 means for indicating the identified tone spacing scheme for either a current
4 subframe or a future subframe.

1 **66.** An apparatus for wireless communication, comprising:
2 means for identifying a tone spacing scheme that includes different tone
3 spacings for wireless communications within a wireless network, the tone spacing scheme
4 indicating tone spacing for a current subframe, a future subframe, or a combination thereof;
5 and

6 means for communicating with a wireless device according to the identified
7 tone spacing scheme.

1 **67.** The apparatus of claim **66**, further comprising:

2 means for selecting the tone spacing scheme from a plurality of available tone
3 spacing schemes.

1 **68.** The apparatus of claim **66**, wherein the means for communicating with
2 the wireless device comprises:

3 means for using one or more different tone spacings for each stage of different
4 stages of wireless communications in accordance with the identified tone spacing scheme.

1 **69.** The apparatus of claim **68**, wherein the means for communicating with
2 the wireless device comprises:

3 means for participating in a random access channel (RACH) procedure with
4 the wireless device in accordance with the identified tone spacing scheme, wherein a tone
5 spacing for the RACH procedure is different from a tone spacing for other stages of
6 communication with the wireless device.

1 **70.** The apparatus of claim **68**, wherein the means for communicating with
2 the wireless device comprises:

3 means for participating in data communications with the wireless device in
4 accordance with the identified tone spacing scheme, wherein a tone spacing for the data
5 communications is different from a tone spacing for other stages of communication with the
6 wireless device.

1 **71.** The apparatus of claim **66**, wherein the means for communicating with
2 the wireless device comprises:

3 means for communicating with the wireless device using one or more different
4 tone spacings for each type of different wireless communication channel types in accordance
5 with the identified tone spacing scheme.

1 **72.** The apparatus of claim **71**, wherein the means for communicating with
2 the wireless device comprises:

3 means for communicating via one or more control channels with the wireless
4 device in accordance with the identified tone spacing scheme, wherein a tone spacing for the
5 one or more control channels is different from a tone spacing for other types of
6 communication with the wireless device.

1 **73.** The apparatus of claim **66**, wherein the means for communicating with
2 the wireless device comprises:

3 means for including an indication of the identified tone spacing scheme via a
4 synchronization channel, a control channel a physical broadcast channel (PBCH), a radio
5 resource control (RRC) message, or a system information block (SIB).

1 **74.** The apparatus of claim **66**, wherein the means for communicating with
2 the wireless device comprises:

3 means for indicating the identified tone spacing scheme via a characteristic of
4 a primary synchronization signal (PSS), a secondary synchronization signal (SSS), or a
5 reference signal.

1 **75.** The apparatus of claim **66**, wherein the means for communicating with
2 the wireless device comprises:

3 means for indicating the identified tone spacing scheme for either an uplink
4 communication, a downlink communication, or a sidelink communication.