IEEE P802.11
Wireless LANs

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| LB203 SST Operation CIDs |
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Abstract

This document proposes a resolution for CID 3624, 3729, 3825, 3826, 3827, 3828, 3829, 3830, 3831, 3832, 3833, 3834, 3835, 3836, 3837, 3838, 3839, 4110, 4111of LB203, comments on the subchannel selective transmission (SST) subclause of TGah Draft 2.0.

**REVISION NOTES:**

R0: initial

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGah Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGah Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGah Editor: Editing instructions preceded by “Instruction to Editor” are instructions to the TGah editor to modify existing material in the TGah draft. As a result of adopting the changes, the TGah editor will execute the instructions rather than copy them to the TGah Draft.***

**CID LIST:**

| **CID** | **Commenter** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
| 3624 | Jerome Henry | 290.53 | 9.47 | Are we saying that we could send a 1 MHz beacon and another 8 MHz beacon on overlapping frequencies in parallel? | Specify that parallel beacons cannot be sent over overlapping frequency, or describe the mechanism by which overlapping beacons are sent without collisions | Revise - generally agree with commenter, TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3624 |
| 3729 | Liwen Chu | 299.18 | 9.47 | "The BSS operating channel width indicated in the Channel Width field of the S1G Operation Information element transmitted by the AP is less than or equal to 2 MHz."This is different from the original SST since originally BSS with >2MHz BSS operation bandwidth is allowed to use SST operation. Why do you add such restriction? | Clarify it. | Reject - An SST BSS is a BSS that has a BSS op CW less than or eq to 2 MHz and an SST Operation CW that is greater than the BSS Op CW (this is the case that requires the inclusion of the SST Operation element and that is why the BSS is called an SST BSS).An an SST AP can set up SST operation via the SST element (i.e., no need for the SST operation element) over its BSS Op CW without the need to have the SST Operation element (i.e., the BSS is not called SST BSS in this case. |
| 3825 | Liwen Chu | 290.18 | 9.47 | What is the reason that a BSS with >2MHz operation channel can't do SST operation. | Justify it. | Reject - An SST BSS is a BSS that has a BSS op CW less than or eq to 2 MHz and an SST Operation CW that is greater than the BSS Op CW (this is the case that requires the inclusion of the SST Operation element and that is why the BSS is called an SST BSS).An an SST AP can set up SST operation via the SST element (i.e., no need for the SST operation element) over its BSS Op CW without the need to have the SST Operation element (i.e., the BSS is not called SST BSS in this case. |
| 3826 | Liwen Chu | 290.39 | 9.47 | "The SST AP that sets up an SST BSS shall choose the subset of allowed SST operating channels from the subset of enabled SST operating channels indicated in the SST Operation element."What is the purpose of the chosen subset of allowed SST operating channels? | Clarify it. | Reject - the AP might have identified interferers present in some channels - the AP might be incapable of simultaneously monitoring m channels - the AP might have an agreement with an OBSS for sharing channels which means that it needs to avoid certain channels |
| 3827 | Liwen Chu | 290.51 | 9.47 | "in parallel" is not strictly defined. It should be in contiguous channel segment which is wider than 2MHz. | As in comment. | Revise - generally agree with commenter, TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3827 |
| 3828 | Liwen Chu | 290.61 | 9.47 | "SIFS after any Beacon in the series is transmitted, another Beacon may be transmitted in the series, provided that normal medium access rules for the channel of transmission of the Beacon have been satisfied."SIFS definitely can't satisfy the medium access rules. In a new channel, at least PIFS should be used before the transmission. | As in comment. | Revise - generally agree with commenter, while noting that for SIFS, the normal medium access rules specify only the passage of time but that this is actually also following normal medium access rules, TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3828 |
| 3829 | Liwen Chu | 291.46 | 9.47 | "An S1G AP may include an SST element (see 8.4.2.170k (Subchannel Selective Transmission element)) in an S1G Beacon to indicate on which channels an SST STA is allowed to transmit within the BSS or SST BSS."Is there any difference when SST element is used in BSS or SST BSS? Why is SST element used in a non-SST BSS? | Remove "the BSS or" from the cited sentence. | Revise - generally do not agree with commenter, as there are two different types of BSS in which SST operation is allowed - an SST BSS and a BSS which is not an SST BSS, but there are some other corrections that can be made - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3829 |
| 3830 | Liwen Chu | 290.57 | 9.47 | "In an SST BSS, an SST STA shall not transmit in a channel that is not the primary channel of the BSS, for which the corresponding bit of the SST Channel Activity Bitmap is 0 in the most recently received SST element from its associated AP."If the primary channel is same as the channel that is indicated by the corresponding bit of the SST Channel Activity Bitmap is 1 in the most recently received SST element from its associated AP, it is better to rewrite it as "In an SST BSS, an SST STA shall transmit in the channel that is indicated by the corresponding bit of the SST Channel Activity Bitmap is 1 in the most recently received SST element from its associated AP." | As in comment. | Revise - generally agree with commenter, except that inverting the sense of this verb will result in something undesired, that is, to say that a “STA shall transmit” means that you are instructing the STA to begin a transmission - instead, this text is describing a restriction, hence the need for the verb “shall not” -TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3830 |
| 3831 | Liwen Chu | 292.04 | 9.47 | Change to "in a channel of operation that is not covered by the BSS operation channel" | As in comment | Revise - generally agree with commenter -TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3831 |
| 3832 | Liwen Chu | 292.11 | 9.47 | SST elements can't indicate the time. | Clarify it. | Revise - generally agree with commenter -TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3832 |
| 3833 | Liwen Chu | 292.35 | 9.47 | ...before PIFS"What is the reference for this PIFS. | Clarify it. | Revise - generally do not agree with the commenter that any change is needed as PIFS is always with reference to the most recently detected or generated medium activity, but there is little philosophical justification for any one life form to believe that it possesses the ultimate truth as compared to the alleged truths that are espoused by others that share this universe and therefore, embracing self-doubt for one’s own understanding and perception of the world is celebratory of the wonderful diversity of life which produces many unique and often contrary answers to the same existential questions - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3833 |
| 3834 | Liwen Chu | 292.37 | 9.47 | "but shall wait for the duration of an NDP before switching to the next channel."I guess what you want to say is that "but shall wait for the end of the slot before switching to the next channel" | As in comment. | Reject - when a RAW is used for SST sounding RAW, there is no RAW format indication, so there is no slot duration and by definition in the SST subclause, the timing of the operation is PIFS plus NDP per channel, so the wait time of “duration of an NDP” is correct. |
| 3835 | Liwen Chu | 291.51 | 9.47 | If SST element allows >2MHz transmission, it is not clear in which 2MHz channel that the AP use NAV and backoff procedure, and in which channel that the AP uses PIFS idle rule before the frame transmission. Same issues exist in STA side. | Clarify it. | Reject - 9.22.2.4 Obtaining an EDCA TXOP describes the medium access as being performed on the primary channel and the language in this TGah draft subclause provides adequate and accurate and clear identification of the primary channel, such that when the TGah amendment is read together with the baseline, there is no question of how an SST STA will operate - i.e. there is no change to 9.22.24 in the TGah draft, so the existing rules still apply - that is, NAV, backoff, etc as is currently stated in the baseline, are based on the primary channel. |
| 3836 | Liwen Chu | 291.34 | 9.47 | In P291L34, an SST AP shall include the SST element in the S1G Beacon frame. In P291L34 an SST AP may include an SST element in transmitted S1G Beacon frames. Which is the correct behavior? | Clarify it. | Revise - there is no conflict. May is used for the general case. There is no requirement to include the element in all S1G beacons. There are a couple of occurrences of shall include, and these exist with some additional qualification, the first requires inclusion within an association response, but only if the AP is implementing an SST BSS. The second shall include is for S1G beacons, but is only a requirement when the S1G beacon precedes a short beacon interval during which the AP wishes “to allow SST operation within that (short) beacon interval” - however, the wording is a bit tricky, so a slight modification is made to make it more readable - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3836 |
| 3837 | Liwen Chu | 291.47 | 9.47 | "The AP may transmit sounding frames for SST STA channel estimation either in parallel or in series or a combination of the two."Where is the sounding procedure if sounding RAW is not used? Which channel is the start channel of sounding. Without sounding RAW, shouldn't the sounding exchange be protected? | Define a clear sounding protocol here. | Reject - the sounding protocol is flexible and has enough description to allow the AP to send sounding as it desires. In particular, the sounding RAW is offered as a means to protect a sounding sequence, but the use of a sounding RAW for protection is not required, just as the use of RTS/CTS is not required, nor generally, are other optional protection mechanisms - note that some protection mechanisms are not optional - but in this case, the choice was made to allow protection to be an optional feature of the SST sounding protocol. As for identification of a non-RAW protected sounding sequence, the draft does contain language that allows this to take place, specifically: “An S1G AP may indicate on which SST channels it intends to transmit sounding and non-sounding frames following the transmission of an S1G Beacon frame by including a SST element in the S1G Beacon frame with a non-zero value in at least one Channel Activity bitmap subfield and a value of 1 in the corresponding DL Activity subfield” - note that the activity indication might include either or both of sounding and non-sounding transmissions. If you want guarantees, use the SST sounding RAW. If the commenter feels that an additional mechanism is needed, the group would like to see the justification for that position before adding another SST sounding protocol or modifying the existing ones. |
| 3838 | Liwen Chu | 293.27 | 9.47 | "An SST STA shall not transmit to the AP on an SST operating channel that is not indicated as allowed by the AP in the SST element or SST Operation element"Why are both SST element and SST Operation element occur here? | Clarify it. | Revise - generally agree with commenter - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3838 |
| 3839 | Liwen Chu | 293.16 | 9.47 | "To avoid ambiguity in which subchannel has been selected by the STA as its primary channel, the STA can send the frame using the minimum width channel for the band of operation."Then how can a STA tell the AP the channel that it want to use, e.g. the STA uses 4MHz channel in a 8MHz channel defined by SST element? | Clarify it. | Revise - agree in part with commenter - in general, there is not a great need for the STA to communicate its width, which is what the group believes the commenter to be asking, although this is an interpretation only because there is some lack of clarity in the wording of the comment - assuming that the width is the item in question, the point is that as long as the STA is transmitting within the permissible channel and maximum width constraints, the AP should be able to receive the frame - if the AP is unable to receive a frame of a specific width and channel combination, then the AP should forbid this combination with appropriate SST Op IE settings - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3839 |
| 4110 | Shusaku Shimada | 291.2 | 9.47 | The terms of "SST width" and "BSS width" in Figure 9-35 are not well defined and misleading. | Discribe using "BSS primary channel width", "enabled SST oeprating channels" and "BSS operating channel width". | Revise - TGah editor to change figure 9-94 by changing the label “BSS width” to “BSS operating channel width” and change “SST width” to “enabled SST operating channels” |
| 4111 | Shusaku Shimada | 292.42 | 9.47 | The amount of time for channel switching operation may be calculatedⁿ@for the non-AP (Receiving) STA, by subtracting the value N\*(PIFS+NDPTxTime) from the total RAW duration and deviding the result by N-1 and adding PIFS, as the maximum value. | As in comment. | Reject - the calculation in the draft is correct. |
| 3109 | Ahmadreza Hedayat | 291.26 | 9.47 | Regarding SST in general and specifically Fig 9-35 and the text associated with it, what if some other STAs attempt to transmit on CH 1 right after the AP has sent the Beacon in CH 1? In this figure, the AP seems to be ready to send several Beacons on CH 1-4 and does not seem that is ready to receive any frame on its primary channel (CH1 or CH2). Or, for an SST scenario the STAs cannot contend for the primary channel after the Beacon is snet until the AP is done with all the Beacons? If this is the case then the rule for this sitiation should be mentioned. | Specify what are the contention rules right after the AP sends Beacon in the primary channel ... | Revise - the AP can use the channel activity schedule of the SST element to describe when UL transmissions are permitted by SST STAs. RAW can be used to keep non-SST STA from transmitting at any particular time in the BSS - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3109 |
| 3110 | Ahmadreza Hedayat | 291.58 | 9.47 | Is "In an SST BSS, an SST STA shall not transmit in a channel that is not the primary channel of the BSS..." in contracdition with P292L58? | Remove the contradition in the referred paragraphs. | Reject - there is no contradiction, since the sentence continues with a conditional that explicitly mentions the SST Channel Activity bit map value. |
| 3133 | Alfred Asterjadhi | 290.23 | 9.47 | I think this requirement should be listed in 24.3.16.4.2. And here simply have it in declarative form. | As in comment. | Revise - generally agree with commenter - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3133 |
| 3134 | Alfred Asterjadhi | 290.41 | 9.47 | There may be some confusion when reading the terms allowed and enabled throughout this subclause. It is better to move the note that is found in the next page to here. Also given that this subclause is too long consider splitting it into three subclauses e.g., : "General, SST AP operation, and SST STA operation." | As in comment. | Revise - generally agree with commenter - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3134 |
| 3135 | Alfred Asterjadhi | 290.56 | 9.47 | THe FORMAT is S1G when the beacon is sent in series | Remove "\_DUP\_2M". | Revise - generally agree with commenter - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3135 |
| 3136 | Alfred Asterjadhi | 291.39 | 9.47 | "operating channel" => "SST channel". And the next paragraph the two sentences can be merged to a sinle one: " The AP may transmit sounding frames to SST STAs for the purpose of estimating channel parameters either in parallel or in series or a combination of the two". | As in comment. | Revise - the sense of the sentences is lost if combining them, because it then implies that an AP must send the frames, but this is not necessary so that change is not performed, however, the change of operating channel to SST channel is accedted - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3136 |
| 3137 | Alfred Asterjadhi | 291.53 | 9.47 | " with a non-zero value in at least one Channel Activity bitmap subfield" => " with a non-zero value in at least one bit of the Channel Activity Bitmap subfield". | As in comment. | Revise - generally agree with commenter - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3137 |
| 3139 | Alfred Asterjadhi | 292.12 | 9.47 | Some rephrasing is suggested for better description: "An SST STA which selected its best SST operating channel(s) may report its selection to the SST AP by sending an NDP PS-Poll frame on the primary channel of the BSS, which includes the selected SST channel offset in the UDI field." | As in comment. | Revise - generally agree with commenter - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3139 |
| 3141 | Alfred Asterjadhi | 292.36 | 9.47 | It is not clear what slottime is. Is it PIFS or simply slot? I think it should be PIFS. | As in comment. | Revise - slot time is the value measured at the MAC to create a PIFS interval on the air but it seems that the baseline incorrectly commonly uses the term PIFS so we defer to the greater weight of incorrect precedent rather than continuing to take the moral high ground - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3141 |
| 3142 | Alfred Asterjadhi | 292.65 | 9.47 | An SST STA that does not receive a Beacon can always transmit in the primary of the BSS just like all other STAs. And what about periodic SST? Clarifications are needed for this paragraph. | Remove the sentence that precedes the last sentence of the paragraph and insert " does not receive a local S1G Beacon, or " after the first "SST STA" of the last sentence. | Revise - partly agree with commenter - TGah editor to execute proposed changes from 11-14-1137r0 found under all headings which include CID3142 |

**Discussion**

**Proposed changes**

**CID 3624, 3729, 3825, 3826, 3827, 3828, 3829, 3830, 3831, 3832, 3833, 3834, 3835, 3836, 3837, 3838, 3839, 4110, 4111**

***TGah editor: Modify subclause 9.42f Subchannel Selective Transmission (SST) of TGah Draft 2.1 as shown:***

* Subchannel Selective Transmission (SST)

S1G STAs that are associated with an S1G AP transmit and receive on the channel or channels that are indicated by the AP as the enabled (#3134) operating channels for the BSS in the most recently transmitted S1G Operation element except when the AP sets up an SST BSS, in which case, associated (#3829) SST STAs can operate on any channel that is indicated by the AP as an enabled SST operating channel for the SST BSS, subject to the rules defined below.

An SST BSS is an S1G BSS for which the following conditions are satisfied:

* The BSS operating channel width indicated in the Channel Width field of the S1G Operation Information element transmitted by the AP is less than or equal to 2 MHz.
* The SST AP indicates that it enables SST operation by including the SST Operation element in the (Re-) Association Response frame sent to the non-AP STA.

 (#3133)An SST AP is an S1G AP with dot11SelectiveSubchannelTransmissionPermitted equal to true.

An SST AP that sets up an SST BSS shall include the SST Operation element in (Re-) Association Response frames sent during association. The S1G AP may include the SST Operation element in S1G Beacon frames. The SST AP indicates the set of enabled SST operating channels, the offset of the primary channel, and the channel width unit in the SST Operation element as described in 8.4.2.170y (SST Operation element). The set of enabled SST operating channels may include channels that are not in use by the BSS as specified by the SST Enabled Channel bitmap of the element. The SST AP that sets up an SST BSS shall choose the subset of allowed SST operating channels from the subset of enabled SST operating channels indicated in the SST Operation element. The set of enabled SST operating channels indicated by the AP is not static.

An SST STA is an S1G STA that is associated with an AP and that chooses a subset of the enabled(#3134) operating channels for the SST on which to operate when SST operation is activated by the AP as indicated in the Subchannel Selective Transmission element. The set of allowed SST channels indicated by the AP in the SST element (#3134) is dynamic and may change every (short) beacon interval.

At each T(S)BTT, an SST AP may send S1G Beacon frames on more than one channel from the set of enabled (#3134) operating channels for the BSS either in parallel or in series or a combination of the two. A STA transmitting parallel S1G Beacons shall use either the value S1G\_DUP\_1M or the value S1G\_DUP\_2M for the TXVECTOR parameter FORMAT of the PHY-TXSTART.request for the transmission. (#3624) (#3827) An example of Beacons sent in parallel is when one Beacon is transmitted with a value of S1G\_DUP\_2M for the TXVECTOR parameter FORMAT and a value of CBW8 for the TXVECTOR parameter CH\_ BANDWIDTH in a BSS with an operating width of 8 MHz. An example of Beacons sent in series is when several different Beacons are transmitted in sequence, each with a value of S1G (#3135) for the TXVECTOR parameter FORMAT and a value of CBW2 for the TXVECTOR parameter CH\_ BANDWIDTH and each transmitted on a different 2 MHz subchannel in a BSS with an 8 MHz operating width. When Beacons are transmitted in series, all of the Beacons may be queued for transmission at T(S)BTT, but only one Beacon is transmitted at a time. SIFS or later (#3828) after any Beacon in the series is transmitted, another Beacon may be transmitted in the series, provided that normal medium access rules for the channel of transmission of the Beacon have been satisfied.

NOTE - When a series of S1G Beacons is transmitted, the AP can use the Channel Activity Schedule of the SST element in those beacons to describe when UL transmissions are permitted by SST STAs in order to protect the beacon sequence and to avoid attempts to communicate with the AP during the beacon transmission sequence. RAW, CTS2SELF and other NAV-setting mechanisms can also be employed for this purpose. (#3109)

An SST AP shall include the SST element in the S1G Beacon frame that immediately precedes a (short) beacon interval when it allows (#3836) SST operation within that (short) beacon interval (see Figure 9-94 (Selective Subchannel Transmission channel transmission permission allocations from SST element)).

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| * Selective Subchannel Transmission channel transmission permission allocations from SST element
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An SST AP may include an SST element in transmitted S1G Beacon frames. An SST AP includes an SST element with the DL bit in the SST element set to 1 and estimated start times and SST channels for DL transmissions in the Channel Activity Schedule field to indicate the expected times for the transmission of DL frames. These frames can be used by the SST STAs to estimate the channel parameters which can be used as input to an algorithm for the selection of an SST (#3136) channel.

The AP may transmit sounding frames to SST STAs for the purpose of estimating channel parameters. The AP may transmit sounding frames for SST STA channel estimation either in parallel or in series or a combination of the two, where a parallel transmission by an S1G AP shall use either the value S1G\_DUP\_1M or the value S1G\_DUP\_2M for the TXVECTOR parameter FORMAT of the PHY-TXSTART.request for the transmission. (#3624)

An S1G AP may include an SST element (see 8.4.2.170l (Subchannel Selective Transmission (SST) element)) in an S1G Beacon to indicate on which channels an SST STA is allowed to transmit within the BSS or SST BSS.

An S1G AP may indicate on which SST channels it intends to transmit sounding and non-sounding frames following the transmission of an S1G Beacon frame by including a SST element in the S1G Beacon frame with a non-zero value in at least one bit of the (#3137) Channel Activity bitmap subfield and a value of 1 in the corresponding DL Activity subfield. An SST STA may choose the best SST channel for transmissions based on its analysis of the sounding signals and received transmissions.

In an SST BSS, an SST STA shall not transmit in a channel that is not the primary channel of the BSS if (#3830) the corresponding bit of the SST Channel Activity Bitmap is 0 in the most recently received SST element from its associated AP. An SST STA shall not transmit using a channel width that is greater than the value of the SST Channel Unit indicated in the most recently received SST Operation element from its associated AP.

When no SST Operation element has been received by an SST STA from its associated AP, the STA shall not transmit a frame with a BSSID that is equal to the BSSID of the BSS with which the STA is associated, in a channel of operation that is not included in the channels (#3831) of operation of the BSS.

If the frames that are transmitted by an S1G AP in response to an announcement of transmission activity within a SST element are sounding frames, the S1G AP shall use the same value for the TXPWR\_LEVEL(#3138) parameter of the TXVECTOR for each of the sounding frame transmissions associated with the SST element announcement. An S1G AP should transmit SST sounding frames at times and on SST channels indicated for downlink activity in the Activity Start Time and Channel Activity Bitmap fields of the (#3832) SST elements that it transmits.

The AP may signal the presence of a RAW for the purpose of SST sounding for a group of STAs using an SST sounding RAW as indicated within a transmitted RPS information element. Such an SST Sounding RAW may be scheduled for periodic or non-periodic operation. An additional RAW(s) may be scheduled as SST Report RAW(s) (see 8.4.2.170b (RPS element)) after the SST Sounding RAW for the transmission of S1G NDP MAC frames (e.g., NDP PS-Poll) by SST STAs on their selected channel(s) for the purpose of communicating a selected subchannel to the AP. The AP is not required to use a RAW for SST sounding.

In the SST Report RAW, the STA transmits a report frame to the AP not earlier than the start of its assigned RAW slot, followed by the AP's response for confirmation after SIFS.

When the AP uses a RAW for SST sounding, RAW Type is Sounding RAW, the RAW Type Options subfield is equal to SST RAW, and the Slot Definition Format Indication indicates that the RAW is used for SST Sounding in the RPS information element (See 8.4.2.170b (RPS element)) transmitted by the AP. The(#3140) SST sounding sequence within the SST Sounding RAW comprises a series of S1G NDP MAC frames (e.g., NDP CTS frames), each transmitted on one of the channels among those indicated by the Channel Indication field of the RAW, starting with lowest frequency channel and continuing in sequence with the next higher frequency channel if more than one channel is indicated. The RPS element for the SST sounding RAW specifies a start time, channel(s) and RAW duration for each RAW assignment. The AP shall not transmit any S1G NDP MAC frame on a channel within an SST sounding RAW before the TxPIFS slot boundary as defined in 9.3.7 (DCF timing relations). (#3833) If the AP does not observe an idle medium condition within one PIFS (#3141) (#Ed) after switching to a channel, then the AP shall not transmit an NDP, but shall wait for the duration of an NDP before switching to the next channel. This allows listening SST STAs to predict the timing of the sounding transmission for each channel. An AP may schedule multiple SST sounding RAWs to increase the probability that a sounding frame is transmitted on each SST channel. The amount of time allocated in the Sounding RAW for the channel switch operations performed by the AP is implementation dependent, and is calculated at the non-AP STA by subtracting the value N \* (PIFS + NDPTxTime) from the total RAW duration and dividing the result by N-1, where N is the number of channels to be sounded.

When the AP uses a RAW for SST operation and the RAW is not a sounding RAW, then the RAW Type is Generic RAW and the Channel Indication Presence bit is set to 1 and the number of channels indicated in the Channel Indication in the RPS information element (See 8.4.2.170b (RPS element)) transmitted by the AP shall be one, unless there is only one STA assigned to each slot in the RAW defined by the RPS element. An AP shall not schedule any non-SST STA within a RAW that has a Channel Indication Presence bit equal to 1.

A local S1G Beacon is one that was transmitted by the AP with which a STA is associated.

An SST STA may select one or more SST channels from the enabled SST operating channels as indicated in the SST Operation element transmitted by the SST AP with which it is associated. The SST STA may operate on those SST channels for the (short) beacon interval following a T(S)BTT if a local S1G Beacon with an SST element indicating that a subset of (#3134) the enabled SST channel(s) are allowed for SST operation has been received by the SST STA during that (short) beacon interval. The STA shall not transmit frames on the indicated allowed SST channels with a bandwidth that is greater than the Maximum Transmission Width specified in the SST element. If no local S1G Beacon is received following a T(S)BTT, then no SST STA transmission is allowed during the (short) beacon interval that begins at that T(S)BTT except on the primary channel of the BSS (#3142). If an SST STA receives a local S1G Beacon which contains no SST element, the SST STA may transmit on the primary channel of the BSS a PPDU of width up to the BSS bandwidth indicated in the S1G Beacon frame during the (short) beacon interval that immediately follows the reception of the S1G Beacon frame.

An SST STA that has selected an SST operating channel that is not the primary channel for the BSS shall operate on the selected channel as though the channel is the primary channel of the BSS, but only at the times allowed for operation on the selected channel as indicated in this subclause.

An SST STA which selected its best SST operating channel(s) may report its selection to the SST AP by sending an NDP PS-Poll frame on the primary channel of the BSS, including the selected SST channel offset (#3839) (#3139) in the UDI field. The transmission of any frame on an allowed subchannel by an SST STA is an implicit indication to the AP as to the subchannel selection made by the SST STA. An SST STA may queue for transmission, a QoS NULL frame addressed to the AP for this purpose. To avoid ambiguity in which subchannel has been selected by the STA as its primary channel, the STA can send the frame using the minimum width channel for the band of operation on the selected primary channel. (#3839)

An SST STA that has selected a subchannel for operation should operate on that subchannel during times indicated for permitted downlink and uplink operation according to the DL Activity and UL Activity fields and the Activity Start Time field in the SST element. An AP should transmit frames to SST STA on their selected subchannels.

An SST STA shall not transmit to the AP on an SST operating channel that is not indicated as allowed by the AP in the SST element and enabled by (#3134) the (#3838) SST Operation element.

* Periodic SST Operation

SST may be operated over a single beacon interval or periodically over multiple beacon intervals. Operation of SST over a single beacon interval shall follow the procedure in 9.42f (Subchannel Selective Transmission (SST)). When the SST operation has identical channel activity schedules in a periodic manner, AP may indicate periodic SST operation parameters in the RPS element in 8.4.2.170b (RPS element). Operation of periodic SST within a beacon interval where SST is scheduled shall follow the procedure in 9.42f (Subchannel Selective Transmission (SST)).

When periodic SST is indicated in the RPS element, both Channel Indication Presence bit and Periodic RAW Indication bit of RPS element are set to 1. The periodicity, validity, and start offset of periodic SST operation are indicated by the Periodic Operation Parameters subfield of the RAW Assignment field of RPS element. When RPS element is used to indicate periodic SST sounding schedule, the RAW Type subfield of the RPS element is set to Sounding RAW and the RAW Type Options subfield of the RPS element is set to SST Sounding RAW.

***TGah editor: Modify subclause 24.3.16.4.2 Transmitter center frequency leakage of TGah Draft 2.1 as shown:***

**24.3.16.4.2 Transmitter center frequency leakage**

TX LO leakage shall meet the following requirements for all formats and bandwidths:

—When the RF LO is in the center of the transmitted PPDU BW, the power measured at the center of transmission BW using resolution BW 31.25 kHz shall not exceed the average power per-subcarrier of the transmitted PPDU, or equivalently,(), where *P* is the transmit power per antenna in dBm, and is defined in Table 24-4 (Timing-related constants).

—When the RF LO is not at the center of the transmitted PPDU BW, the power measured at the location of the RF LO using resolution BW 31.25 kHz shall fall within that resolution BW of a 2 MHz channelization boundary and shall not exceed the maximum of -27dB relative to the total transmit power and -15dBm, or equivalently max(*P*-27,-15), where *P* is the transmit power per antenna in dBm. In regions where 2 MHz channelization does not exist, the TX LO leakage shall fall within the resolution BW of a 1 MHz channelization boundary. (#3133)

The transmit center frequency leakage is specified per antenna.

**References:**