IEEE P802.11  
Wireless LANs

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| --- | --- | --- | --- | --- |
| Resolutions to TXVECTOR and RXVECTOR of 11ah PHY | | | | |
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Abstract

This submission shows

* Resolution for a comment received from TGm comment collection (11Revmd D1.0)
* The proposed changes are based on 11Revmd D1.0.

The submission provides resolutions to comments related to TXVECTOR and RXVECTOR parameters.

* The submission provides resolutions to ~~8~~ 6 CIDs:   
  1136, 1131, 1132, 1133, 1134 and 1135 ~~and 1138 and 1139~~

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: additional text modification in blue.
* Rev 2: modification based on some comment by co-author
* Rev 3
  + Resolution text for CID1133, CID1135 and CID1138 updated.
  + Modification in green on Rev 2 by feedbacks at md session and e-mail discussion.
* Rev 4
  + CID1138 and CID1139 removed to be combined with CID1013 in 11-18-1062-00-00m
    - Modification in Rev3 replaced with original text.
  + LENGTH, PSDU\_LENGTH and APEP\_LENGTH parameters are still under review.
  + Updates on discussion part
* Rev 5
  + Text modification applied in magenta

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 1136 | 3082.59 | Why is there a reference to Table 19-1 here? Surely the S1G STA does not transmit HT PPDUs. There should be no references to Table 19-1 or Table 21-1 in this table. | The last 3 rows should probably be one row with Otherwise, Not present, N, N. Review other rows that reference these tables. | Revised  Agreed in principle. All parameters including entry in Table 19-1 and Table 21-1 were reviewd and delected.  TGm Editor: make changes according to this document 11-18-710-05-00m Resolutions to TXVECTOR and RXVECTOR of 11ah PHY. |
| 1131 | 3085.10 | There are only 3 FORMAT types so FORMAT is irrelavant for AGGREGATION. It is not clear what the Otherwise condition refers to (there are only 3 formats) | Collapse to a single row | Revised  Agreed in principle.  TGm Editor: make changes according to this document 11-18-710-05-00m Resolutions to TXVECTOR and RXVECTOR of 11ah PHY |
| 1132 | 3085.41 | There are only 3 FORMAT types so FORMAT is irrelavant for N\_TX It is not clear what the Otherwise condition refers to (there are only 3 formats) | Collapse to a single row | Revised  Agreed in principle.  TGm Editor: make changes according to this document 11-18-710-05-00m Resolutions to TXVECTOR and RXVECTOR of 11ah PHY |
| 1133 | 3086.10 | There are only 3 FORMAT types so FORMAT is irrelavant for EXPANSION\_MAT\_TYPE. | Collapse to a single row | Revised  Agreed in principle.  But the parameter conveys no information. So the parameter is removed  TGm Editor: make changes according to this document 11-18-710-05-00m Resolutions to TXVECTOR and RXVECTOR of 11ah PHY |
| 1134 | 3086.24 | There are only 3 FORMAT types so FORMAT is irrelavant for EXPANSION\_MAT. It is not clear what the Otherwise condition refers to (there are only 3 formats) | Collapse to a single row | Revised  Agreed in principle.  However, MU is shown to indicate that the paramenter is present per user when FORMAT is S1G.  Add EXPANSION\_MAT\_TYPE is COMPRESSED\_SV in Condition to make it clear.  TGm Editor: make changes according to this document 11-18-710-05-00m Resolutions to TXVECTOR and RXVECTOR of 11ah PHY |
| 1135 | 3087.10 | There are a lot of unnecessary rows here | With appropriate conditions this can be collapsed from 9 to 2 rows. Review other parameters for similar problems. | Revised  Agreed in principle.  But the parameter conveys no information. So the parameter is removed  As commenter requested, CHAN\_MAT parameter was also reviewed and modified.  TGm Editor: make changes according to this document 11-18-710-05-00m Resolutions to TXVECTOR and RXVECTOR of 11ah PHY |
| ~~1138~~ | ~~3094.10~~ | ~~Why is this parameter called LENGTH if it indicates a packet duration? And why does it indicate a duration in "number of symbols"? What is an "S1G PSDU"? And "S1G 2 MHz Duplicate PSDU", etc.~~ | ~~Change the parameter name to NUM\_SYM (or something similar) and change Value to "Indicates the number of sumbols in the PPDU" (not PSDU). FORMAT appears to be irrelavant so this could be collapsed to a single row. If this really is a length in octets then maybe the Value column should have "Indicates the number of octets in the PDSU"~~ | ~~Revised  Agreed in principle.  However, depending on AGGREGATION parameter, its value indicates the packet duration in 1) number of symbols or 2) number of octets. Since the current name presents its intention properly, it deserves to keep its name as it is.  As for simplifying the table, it is modified as follows~~  ~~- AGGREGATION is AGGREGATED, it indicates the packet duration in number of symbols, N\_sym, defined in 23.4.3 (TXTIME and PSDU\_LENGTH calculation). - AGGREGATION is NOT\_AGGREGATED, it indicates the packet duration in number of octets defined in PSDU\_LENGTH parameter.~~  ~~TGm Editor: make changes according to this document 11-18-710-05-00m Resolutions to TXVECTOR and RXVECTOR of 11ah PHY~~ |
| ~~1139~~ | ~~3094.36~~ | ~~There is something wrong here. FORMAT = "S1G\_DUP\_1M" and "S1G\_DUP\_2M" is not mentioned here and certainly not in tables 19-1 or 21-1. I don't think there should be any reference to table 19-1 or 21-1 since an S1G STA does not transmit HT or VHT PPDUs.~~ | ~~Define APEP\_LENGHT for FORMAT=S1G\_DUP\_{1,2}M. It might be that it is not present but I doubt it.~~ | ~~Revised   Agreed in principle. Deleting FORMAT is S1G in Condition, it naturally covers all cases.~~  ~~TGm Editor: make changes according to this document 11-18-710-05-00m Resolutions to TXVECTOR and RXVECTOR of 11ah PHY~~ |

***Discussion***

1. With FORMAT parameter defined as S1G, S1G\_DUP\_1M and S1G\_DUP\_2M in 11ah, other entires except for those three do not exist to refer to Table 19-1 or Table 21-1.

* For example, looking at STBC parameter below, values to indicate whether or not STBC are described repeatly regardless of its FORMAT. Moreover, there is no remaining FORMAT options.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| STBC | FORMAT is S1G | Indicates whether or not STBC is used.  0 indicates no STBC (*NSTS=NSS* in the Data field).  1 indicates STBC is used (*NSTS=2NSS* in the Data field)*.* | Y | Y |
| FORMAT is S1G\_DUP\_2M | Indicates whether or not STBC is used.  0 indicates no STBC (*NSTS=NSS* in the Data field).  1 indicates STBC is used (*NSTS=2NSS* in the Data field)*.* | Y | Y |
| FORMAT is S1G\_DUP\_1M | Indicates whether or not STBC is used.  0 indicates no STBC (*NSTS=NSS* in the Data field).  1 indicates STBC is used (*NSTS=2NSS* in the Data field)*.* | Y | Y |
| Otherwise | See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters). | | |

* Without changing its meaning, the modification could make it simple as follows.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| STBC | ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Indicates whether or not STBC is used.  0 indicates no STBC (*NSTS=NSS* in the Data field).  1 indicates STBC is used (*NSTS=2NSS* in the Data field)*.* | Y | Y |

* For example, turning to SCRAMBLER\_OR\_CRC parameter below, in case of NDP\_INDICATION set to 0, its values are not concerned with FORMAT parameter.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SCRAMBLER\_OR\_CRC | FORMAT is S1G and NDP\_INDICATION is 0 | Indicates the Scrambler Initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling.  Bit sequence of 7 bits in length: [B0:B6] of the SERVICE field value prior to descrambling. | N | Y |
| FORMAT is S1G\_DUP\_2M and NDP\_INDICATION is 0 | Indicates the Scrambler Initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling.  Bit sequence of 7 bits in length: [B0:B6] of the SERVICE field value prior to descrambling. | N | Y |
| FORMAT is S1G\_DUP\_1M and NDP\_INDICATION is 0 | Indicates the Scrambler Initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling.  Bit sequence of 7 bits in length: [B0:B6] of the SERVICE field value prior to descrambling. | N | Y |
| FORMAT is S1Gand NDP\_INDICATION is 1 | Indicates the value of the calculated CRC in the SIG field.  Bit sequence of 4 bits in length: Either [B26:B29] of the 1 MHz SIG field or [B38:B41] of the ≥ 2 MHz SIG field. | N | Y |
| FORMAT is S1G\_DUP\_2M and NDP\_INDICATION is 1 | Indicates the value of the calculated CRC in the SIG field.  Bit sequence of 4 bits in length: [B38:B41] of the ≥ 2 MHz SIG field. | N | Y |
| FORMAT is S1G\_DUP\_1M and NDP\_INDICATION is 1 | Indicates the value of the calculated CRC in the SIG field.  Bit sequence of 4 bits in length: [B26:B29] of the 1 MHz SIG field. | N | Y |
| Otherwise | Not present | N | Y |

* Without changing its meaning, the modification could make it simple as follows.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SCRAMBLER\_OR\_CRC | NDP\_INDICATION is 0 | Indicates the Scrambler Initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling.  Bit sequence of 7 bits in length: [B0:B6] of the SERVICE field value prior to descrambling. | N | Y |
| FORMAT is S1G and NDP\_INDICATION is 1 | Indicates the value of the calculated CRC in the SIG field.  Bit sequence of 4 bits in length: Either [B26:B29] of the 1 MHz SIG field or [B38:B41] of the ≥ 2 MHz SIG field. | N | Y |
| FORMAT is S1G\_DUP\_2M and NDP\_INDICATION is 1 | Indicates the value of the calculated CRC in the SIG field.  Bit sequence of 4 bits in length: [B38:B41] of the ≥ 2 MHz SIG field. | N | Y |
| FORMAT is S1G\_DUP\_1M and NDP\_INDICATION is 1 | Indicates the value of the calculated CRC in the SIG field.  Bit sequence of 4 bits in length: [B26:B29] of the 1 MHz SIG field. | N | Y |

* Those criteria above are applied to all parameters of TXVECTOR and RXVECTOR parameters in Table 23-1.

1. Invalid parameter conditions were modified and deleted.

* In 11ah, the S1G\_LONG format is not used for S1G\_DUP\_2M transmissions such that S1G\_DUP\_2M does not support S1G MU PPDU.
* For example, considering PREAMBLE\_TYPE paremeter

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PREAMBLE\_TYPE | FORMAT is S1G\_DUP\_2M | Set to S1G\_SHORT\_PREAMBLE defined in 23.3.8.2.1 (S1G\_SHORT preamble).  ~~Determine the type of preamble of the S1G 2 MHz Duplicate mode PPDU.~~  ~~Enumerated type:~~  ~~S1G\_SHORT\_PREAMBLE indicates the short preamble defined in 23.3.8.2.1 (S1G\_SHORT preamble).~~  ~~S1G\_LONG\_PREAMBLE indicates the long preamble defined in 23.3.8.2.2 (S1G\_LONG preamble).~~ | Y | Y |

* For example, considering USER\_POSITION and GROUP\_ID parameters,

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| USER\_POSITION | FORMAT is S1G and  (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and MU\_SU equals MU | | Index for user in MU transmission. Integer: range 0–3.  NOTE—The entries in the USER\_POSITION array are in ascending order. | Y | Y | |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals MU~~ | | ~~Index for user in MU transmission. Integer: range 0–3.~~  ~~NOTE—The entries in the USER\_POSITION array are in ascending order.~~ | ~~Y~~ | ~~Y~~ | |
|
| Otherwise | | Not present | N | N | |
| GROUP\_ID | | FORMAT is S1G and  (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and MU\_SU equals MU | Indicates the group ID.  Integer: range 1–62 (see Table 23-14 (Fields in the SIG-A field of S1G\_LONG preamble MU PPDU (11ah)) in  23.3.8.2.2.1.5). | | Y | Y |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals MU~~ | ~~Indicates the group ID.~~  ~~Integer: range 1–62 (see Table 23-14 (Fields in the SIG-A field of S1G\_LONG preamble MU PPDU (11ah)) in~~  ~~23.3.8.2.2.1.5).~~ | | ~~Y~~ | ~~Y~~ |
| ~~FORMAT is S1G and MU\_SU equals SU~~ | ~~Not present~~ | | ~~N~~ | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals SU~~ | ~~Not present~~ | | ~~N~~ | ~~N~~ |
| ~~FORMAT is S1G and CH\_BANDWIDTH equals CBW1~~ | ~~Not present~~ | | ~~N~~ | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Not present~~ | | ~~N~~ | ~~N~~ |
| Otherwise | Not present | | N | N |

* Those criteria above are applied to all parameters of TXVECTOR and RXVECTOR parameters in Table 23-1.

1. Key modifications shown below are based on discussion on IEEE F2F meeting on May and e-mail discussion afterward.
   1. In case there is only one condition left such as “FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M”, Condition remains empty as an example below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| STBC | ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Indicates whether or not STBC is used.  0 indicates no STBC (*NSTS=NSS* in the Data field).  1 indicates STBC is used (*NSTS=2NSS* in the Data field)*.* | Y | Y |

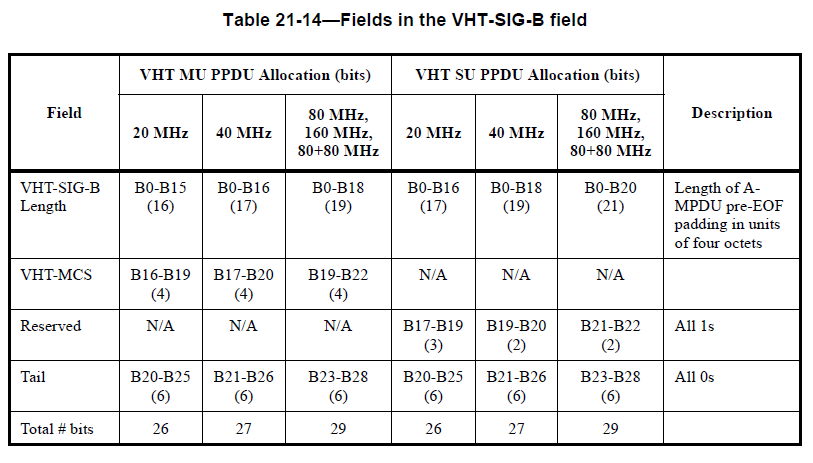
* 1. Since initial resolutions to CID1133, 1134 and 1135 based on Rev.2 made attendees in md session confused,
     1. Corresponding text has been fixed in order to remove circular reasoning as below
     2. Delete the parameters such as EXPANSION\_MAT\_TYPE that does not provide any information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ~~EXPANSION\_MAT\_TYPE~~ | ~~EXPANSION\_MAT is present~~ | ~~Set to COMPRESSED\_SV. (#1133)~~ | ~~Y~~ | ~~N~~ |
| ~~Otherwise~~ | ~~Not present~~ | ~~N~~ | ~~N~~ |
| EXPANSION\_MAT | FORMAT is S1G ~~and EXPANSION\_MAT\_TYPE is COMPRESSED\_SV~~ (#1134) | Contains a vector in the number of selected subcarriers containing feedback matrices as defined in 23.3.10.2  (Beamforming Feedback Matrix V) based on the channel measured during the training symbols of a previous S1G NDP PPDU. | MU | N |
| FORMAT is S1G\_DUP\_2M ~~and EXPANSION\_MAT\_TYPE is COMPRESSED\_SV~~ (#1134) | Contains a vector in the number of selected subcarriers containing feedback matrices as defined in 23.3.10.2  (Beamforming Feedback Matrix V) based on the channel measured during the training symbols of a previous S1G NDP PPDU. | ~~MU~~  O | N |
| FORMAT is S1G\_DUP\_1M ~~and EXPANSION\_MAT\_TYPE is COMPRESSED\_SV~~ (#1134) | Contains a vector in the number of selected subcarriers containing feedback matrices as defined in 23.3.10.2  (Beamforming Feedback Matrix V) based on the channel measured during the training symbols of a previous S1G NDP PPDU. | Y | N |

* 1. Based on e-mail discussion, additional text modification conducted.
  2. For your information, presentation on F2F meeting was stopped after MCS parameter.

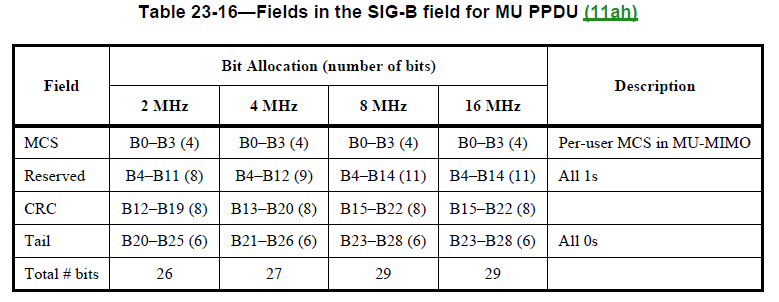
1. Based on the discussion on teleconference call on June 1st, it turned out that there are some points to be clarified further.

* Clarify whether the behaviour cascade from other locations if we remove the references.
  + Since Table 23-1 has defined only three Format parameter, deleting those references does not make an unexpected impact at least in this table.
  + Beyond the table in case some values are reused from 11ac or 11n, since each has refered to the corresponding PHY specs, respectively, it does not cause any ripple effect to other locations.
* Clarify whether additional description is needed in APEP\_LENGTH parameter for 11ah (e.g. VHT-SIG-B Length in RXVECTOR of 11ac).
  + The VHT-SIG-B Length field (per user *u*) has been defined in VHT-SIG-B field to define the length of A-MPDU pre-EOF padding in units of four octets at P2952L25 in 11ac spec. The corresponding decription has been shown in APEP\_LENGTH parameter as below.

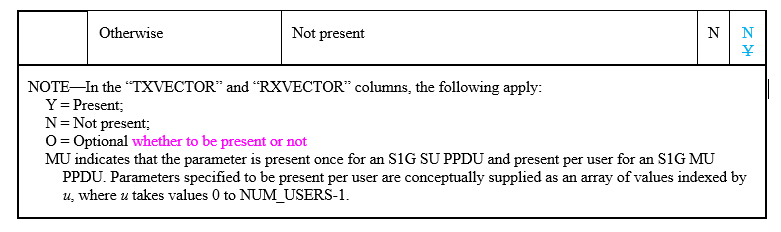




* + For 11ah, S1G LONG preamble supporting MU transmission does not contain any corresponding field to indicate the length of A-MPDU pre-EOF padding as below.
  + Since it is reserved, additional description is not required. APEP\_LENGTH as optional in RXVECTOR could be induced in MAC layer by EOF padding field.



There was some misunderstanding on the meaning of O (Optional) in Table 23-1 during the teleconference call. It turned out that it has nothing to do with whether its feature is mandatory or not. It means its presence is optional. In order to make it clear, NOTE has been updated.



***To TGm Editor:*** ***P3082L24*** *replace the current text with the proposed changes below.*

***------------- Begin Text Changes ---------------***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| * TXVECTOR and RXVECTOR parameters (11ah) | | | | | |
| Parameter | Condition | Value | **TXVECTOR** | | **RXVECTOR** |
| FORMAT |  | Determines the format of the PPDU.  Enumerated type:  S1G indicates S1G PPDU format.  S1G\_DUP\_1M indicates S1G 1 MHz Duplicate PPDU format  S1G\_DUP\_2M indicates S1G 2 MHz Duplicate PPDU format | Y | | Y |
| PREAMBLE\_TYPE | FORMAT is S1G and (CH\_BANDWIDTH is CBW2 or CBW4 or CBW8 or CBW16) | Determine the type of preamble of the S1G PPDU.  Enumerated type:  S1G\_SHORT\_PREAMBLE indicates the short preamble defined in 23.3.8.2.1 (S1G\_SHORT preamble).  S1G\_LONG\_PREAMBLE indicates the long preamble defined in 23.3.8.2.2 (S1G\_LONG preamble). | Y | | Y |
| FORMAT is S1G\_DUP\_2M | Set to S1G\_SHORT\_PREAMBLE defined in 23.3.8.2.1 (S1G\_SHORT preamble).  ~~Determine the type of preamble of the S1G 2 MHz Duplicate mode PPDU.~~  ~~Enumerated type:~~  ~~S1G\_SHORT\_PREAMBLE indicates the short preamble defined in 23.3.8.2.1 (S1G\_SHORT preamble).~~  ~~S1G\_LONG\_PREAMBLE indicates the long preamble defined in 23.3.8.2.2 (S1G\_LONG preamble).~~ | Y | | Y |
| Otherwise | Not present (#1136) | N | | N |
| ~~FORMAT is S1G and CH\_BANDWIDTH equals CBW1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| MU\_SU | FORMAT is S1G and PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE and CH\_BANDWIDTH is CBW2 or CBW4 or CBW8 or CBW16) | Determine whether MU or SU of the S1G PPDU  Enumerated type:  Set to MU if NUM\_USERS is 2 to 4.  Set to SU if NUM\_USERS is 1. | Y | | Y |
| Otherwise | Not present | N | | N |
| NDP\_INDICATION | ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Determine the type of S1G frame.  Set to 1 if this packet is one of NDP CMAC frames as defined in 9.9 (NDP CMAC frames(11ah)).  Set to 0 otherwise. | Y | | Y |
| ~~Otherwise~~ | ~~Not present~~ (#1136) | ~~N~~ | | ~~N~~ |
| NDP\_CMAC\_FRAME\_BODY | NDP\_INDICATION is 1 | Set to concatenated bit fields, which describe the NDP CMAC frame body content in one of NDP CMAC frame types defined in Table 9-502 (NDP CMAC frame Type field values(11ah)).  (See 9.9 (NDP CMAC frames(11ah))). | Y | | Y |
| Otherwise | Not present | N | | N |
| SMOOTHING | ~~FORMAT is S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and PREAMBLE\_TYPE equals S1G\_SHORT\_PREAMBLE~~ | ~~Indicates whether (Ed)frequency domain smoothing is recommended as part of channel estimation.~~  ~~Set to 1 if (Ed)frequency domain smoothing is recommended.~~  ~~Set to 0 otherwise.~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M and PREAMBLE\_TYPE equals S1G\_SHORT\_PREAMBLE~~ | ~~Indicates whether (Ed)frequency domain smoothing is recommended as part of channel estimation.~~  ~~Set to 1 if (Ed)frequency domain smoothing is recommended.~~  ~~Set to 0 otherwise.~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates whether (Ed)frequency domain smoothing is recommended as part of channel estimation.~~  ~~Set to 1 if (Ed)frequency domain smoothing is recommended.~~  ~~Set to 0 otherwise.~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G and CH\_BANDWIDTH equals CBW1~~ | ~~Indicates whether (Ed)frequency domain smoothing is recommended as part of channel estimation.~~  ~~Set to 1 if (Ed)frequency domain smoothing is recommended.~~  ~~Set to 0 otherwise.~~ | ~~Y~~ | | ~~Y~~ |
| FORMAT is S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and PREAMBLE\_TYPE equals S1G\_LONG\_PREAMBLE  and NUM\_STS is lager than 1 | ~~If NUM\_STS is larger than 1,~~ ~~i~~Indicates whether (Ed)frequency domain smoothing is recommended as part of channel estimation.  Set to 1 if (Ed)frequency domain smoothing is recommended.  Set to 0 otherwise. | Y | | Y |
| FORMAT is S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and PREAMBLE\_TYPE equals S1G\_LONG\_PREAMBLE  and NUM\_STS is 1 | Not present | N | | N |
| Otherwise | Indicates whether (Ed)frequency domain smoothing is recommended as part of channel estimation.  Set to 1 if (Ed)frequency domain smoothing is recommended.  Set to 0 otherwise. | Y | | Y |
| ~~FORMAT is S1G\_DUP\_2M and PREAMBLE\_TYPE equals S1G\_LONG\_PREAMBLE~~ | ~~If NUM\_STS is larger than 1, indicates whether (Ed)frequency domain smoothing is recommended as part of channel estimation.~~  ~~Set to 1 if (Ed)frequency domain smoothing is recommended.~~  ~~Set to 0 otherwise.~~ | ~~Y~~ | | ~~Y~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ (#1136) | | | |
| AGGREGATION | ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Indicates whether the PSDU contains an A-MPDU.  Enumerated type:  AGGREGATED indicates this packet has A-MPDU aggregation.  NOT\_AGGREGATED indicates this packet does not have A-MPDU aggregation. (#1131) | Y | | Y |
| ~~FORMAT is S1G~~ | ~~Indicates whether the PSDU contains an A-MPDU.~~  ~~Enumerated type:~~  ~~AGGREGATED indicates this packet has A-MPDU aggregation.~~  ~~NOT\_AGGREGATED indicates this packet does not have A-MPDU aggregation.~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Indicates whether the PSDU contains an A-MPDU.~~  ~~Enumerated type:~~  ~~AGGREGATED indicates this packet has A-MPDU aggregation.~~  ~~NOT\_AGGREGATED indicates this packet does not have A-MPDU aggregation.~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates whether the PSDU contains an A-MPDU.~~  ~~Enumerated type:~~  ~~AGGREGATED indicates this packet has A-MPDU aggregation.~~  ~~NOT\_AGGREGATED indicates this packet does not have A-MPDU aggregation.~~ | ~~Y~~ | | ~~Y~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| SECTOR\_ID | ~~Format~~ FORMAT is S1G and ~~preamble type~~ PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE | Indicates which sectorized beam of the available sectorized beams are used in the transmission. The length of the parameter is 8 bits. A 1 in bit position n, relative to the LSB, indicates that Sector n is used.  This parameter is present only if sectorization is applied. | O | | N |
| Otherwise | Not present | N | | N |
| N\_TX | ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Indicates the number of transmit chains. (#1132) | Y | | N |
| ~~FORMAT is S1G~~ | ~~Indicates the number of transmit chains.~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Indicates the number of transmit chains.~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates the number of transmit chains.~~ | ~~Y~~ | | ~~N~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| ~~EXPANSION\_MAT\_TYPE~~ | ~~EXPANSION\_MAT is present~~ | ~~Set to COMPRESSED\_SV. (#1133)~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G and EXPANSION\_MAT is present~~ | ~~Set to COMPRESSED\_SV~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and EXPANSION\_MAT is present~~ | ~~Set to COMPRESSED\_SV~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M and EXPANSION\_MAT is present~~ | ~~Set to COMPRESSED\_SV~~ | ~~Y~~ | | ~~N~~ |
| ~~Otherwise~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| EXPANSION\_MAT | FORMAT is S1G ~~and EXPANSION\_MAT\_TYPE is COMPRESSED\_SV~~ (#1134) | Contains a vector in the number of selected subcarriers containing feedback matrices as defined in 23.3.10.2  (Beamforming Feedback Matrix V) based on the channel measured during the training symbols of a previous S1G NDP PPDU. | MU | | N |
| FORMAT is S1G\_DUP\_2M ~~and EXPANSION\_MAT\_TYPE is COMPRESSED\_SV~~ (#1134) | Contains a vector in the number of selected subcarriers containing feedback matrices as defined in 23.3.10.2  (Beamforming Feedback Matrix V) based on the channel measured during the training symbols of a previous S1G NDP PPDU. | ~~MU~~  ~~O~~  Y  ~~Y~~ | | N |
| FORMAT is S1G\_DUP\_1M ~~and EXPANSION\_MAT\_TYPE is COMPRESSED\_SV~~ (#1134) | Contains a vector in the number of selected subcarriers containing feedback matrices as defined in 23.3.10.2  (Beamforming Feedback Matrix V) based on the channel measured during the training symbols of a previous S1G NDP PPDU. | Y | | N |
| ~~Otherwise~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| ~~CHAN\_MAT\_TYPE~~ | ~~FORMAT is S1G and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 0~~ | ~~Set to COMPRESSED\_SV~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 0~~ | ~~Set to COMPRESSED\_SV~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 0~~ | ~~Set to COMPRESSED\_SV~~ | ~~N~~ | | ~~Y~~ |
| ~~PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 0~~ | ~~Set to COMPRESSED\_SV (#1135)~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G and PSDU\_LENGTH is greater than 0~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and PSDU\_LENGTH is greater than 0~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M and PSDU\_LENGTH is greater than 0~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~Otherwise~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| CHAN\_MAT | ~~FORMAT is S1G and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 0~~ | ~~Contains a set of compressed beamforming feedback matrices as defined in 23.3.10.2 (Beamforming Feedback Matrix V) based on the channel measured during the training symbols of the received S1G NDP PPDU.~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 0~~ | ~~Contains a set of compressed beamforming feedback matrices as defined in 23.3.10.2 (Beamforming Feedback Matrix V) based on the channel measured during the training symbols of the received S1G NDP PPDU.~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 0~~ | ~~Contains a set of compressed beamforming feedback matrices as defined in 23.3.10.2 (Beamforming Feedback Matrix V) based on the channel measured during the training symbols of the received S1G NDP PPDU.~~ | ~~N~~ | | ~~Y~~ |
| PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 0 | Contains a set of compressed beamforming feedback matrices as defined in 23.3.10.2 (Beamforming Feedback Matrix V)based on the channel measured during the training symbols of the received S1G NDP PPDU. (#1135) | N | | Y |
| ~~FORMAT is S1G and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M and PSDU\_LENGTH equals 0 and NDP\_INDICATION equals 1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G and PSDU\_LENGTH is greater than 0~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and PSDU\_LENGTH is greater than 0~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M and PSDU\_LENGTH is greater than 0~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| Otherwise | Not present | N | | N |
| ~~Otherwise~~ (#1136) | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| DELTA\_SNR | FORMAT is S1G and (CH\_BANDWIDTH is CBW2 or CBW4 or CBW8 or CBW16) | Contains an array of delta SNR values as defined in 9.4.1.50 (MU Exclusive Beamforming Report field) based on the channel measured during the training symbols of the received S1G NDP PPDU.  NOTE—In the RXVECTOR this parameter is present only for S1G NDP PPDUs for MU sounding. | MU | | Y |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Contains an array of delta SNR values as defined in 9.4.1.50 (MU Exclusive Beamforming Report field) based on the channel measured during the training symbols of the received S1G NDP PPDU.~~  ~~NOTE—In the RXVECTOR this parameter is present only for S1G NDP PPDUs for MU sounding.~~ | ~~MU~~ | | ~~Y~~ |
| Otherwise | Not present | N | | N |
| ~~FORMAT is S1G and CH\_BANDWIDTH is CBW1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
|
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~Otherwise~~ (#1136) | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| RCPI |  | Is a measure of the received RF power averaged over all the receive chains in the Data field of a received PPDU.  Refer to 19.3.19.6 (Received channel power indicator (RCPI) measurement) for the definition of RCPI. | N | | Y |
| SNR | ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Contains an array of measures of the received SNR for each spatial stream. SNR indications of 8 bits are supported. SNR shall be the sum of the decibel values of SNR per tone divided by the number of tones represented in each stream as described in 9.4.1.48 (VHT Compressed Beamforming Report field). (#1136) | N | | Y |
| ~~FORMAT is S1G~~ | ~~Contains an array of measures of the received SNR for each spatial stream. SNR indications of 8 bits are supported. SNR shall be the sum of the decibel values of SNR per tone divided by the number of tones represented in each stream as described in 9.4.1.48 (VHT Compressed Beamforming Report field).~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Contains an array of measures of the received SNR for each spatial stream. SNR indications of 8 bits are supported. SNR shall be the sum of the decibel values of SNR per tone divided by the number of tones represented in each stream as described in 9.4.1.48 (VHT Compressed Beamforming Report field).~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Contains an array of measures of the received SNR for each spatial stream. SNR indications of 8 bits are supported. SNR shall be the sum of the decibel values of SNR per tone divided by the number of tones represented in each stream as described in 9.4.1.48 (VHT Compressed Beamforming Report field).~~ | ~~N~~ | | ~~Y~~ |
| ~~Otherwise~~ (#1136) | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| FEC\_CODING | FORMAT is S1G | Indicates which FEC encoding is used.  Enumerated type:  BCC\_CODING indicates binary convolutional code.  LDPC\_CODING indicates low-density parity check code. | MU | | Y |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Indicates which FEC encoding is used.~~  ~~Enumerated type:~~  ~~BCC\_CODING indicates binary convolutional code.~~  ~~LDPC\_CODING indicates low-density parity check code.~~ | ~~MU~~  ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates which FEC encoding is used.~~  ~~Enumerated type:~~  ~~BCC\_CODING indicates binary convolutional code.~~  ~~LDPC\_CODING indicates low-density parity check code.~~ | ~~Y~~ | | ~~Y~~ |
| FORMAT is S1G\_DUP\_2M or S1G\_DUP\_1M | Indicates which FEC encoding is used.  Enumerated type:  BCC\_CODING indicates binary convolutional code.  LDPC\_CODING indicates low-density parity check code. | Y | | Y |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ (#1136) | | | |
| STBC | ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Indicates whether or not STBC is used.  0 indicates no STBC (*NSTS=NSS* in the Data field).  1 indicates STBC is used (*NSTS=2NSS* in the Data field)*.* | Y | | Y |
| ~~FORMAT is S1G~~ | ~~Indicates whether or not STBC is used.~~  ~~0 indicates no STBC (~~*~~N~~~~STS~~~~=N~~~~SS~~* ~~in the Data field).~~  ~~1 indicates STBC is used (~~*~~N~~~~STS~~~~=2N~~~~SS~~*~~in the Data field)~~*~~.~~* | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Indicates whether or not STBC is used.~~  ~~0 indicates no STBC (~~*~~N~~~~STS~~~~=N~~~~SS~~* ~~in the Data field).~~  ~~1 indicates STBC is used (~~*~~N~~~~STS~~~~=2N~~~~SS~~*~~in the Data field)~~*~~.~~* | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates whether or not STBC is used.~~  ~~0 indicates no STBC (~~*~~N~~~~STS~~~~=N~~~~SS~~* ~~in the Data field).~~  ~~1 indicates STBC is used (~~*~~N~~~~STS~~~~=2N~~~~SS~~*~~in the Data field)~~*~~.~~* | ~~Y~~ | | ~~Y~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| GI\_TYPE | ~~FORMAT is S1G~~ | ~~Indicates whether a short guard interval is used in the transmission of the Data field of the PPDU.~~  ~~Enumerated type:~~  ~~LONG\_GI indicates short GI is not used in the Data field of the PPDU.~~  ~~SHORT\_GI indicates short GI is used in the Data field of the PPDU.~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Indicates whether a short guard interval is used in the transmission of the Data field of the PPDU.~~  ~~Enumerated type:~~  ~~LONG\_GI indicates short GI is not used in the Data field of the PPDU.~~  ~~SHORT\_GI indicates short GI is used in the Data field of the PPDU.~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates whether a short guard interval is used in the transmission of the Data field of the PPDU.~~  ~~Enumerated type:~~  ~~LONG\_GI indicates short GI is not used in the Data field of the PPDU.~~  ~~SHORT\_GI indicates short GI is used in the Data field of the PPDU.~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Indicates whether a short guard interval is used in the transmission of the Data field of the PPDU.  Enumerated type:  LONG\_GI indicates short GI is not used in the Data field of the PPDU.  SHORT\_GI indicates short GI is used in the Data field of the PPDU. (#1136) | Y | | Y |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | ~~N~~ | | ~~N~~ |
| TXPWR\_LEVEL | ~~FORMAT is S1G~~ | ~~The allowed values for the TXPWR\_LEVEL parameter are in the range from 1 to numberOfOctets(dot11TxPowerLevelExtended)/2. This parameter is used to indicate which of the available transmit output power levels defined in dot11TxPowerLevelExtended shall be used for the current transmission.~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~The allowed values for the TXPWR\_LEVEL parameter are in the range from 1 to numberOfOctets(dot11TxPowerLevelExtended)/2. This parameter is used to indicate which of the available transmit output power levels defined in dot11TxPowerLevelExtended shall be used for the current transmission.~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~The allowed values for the TXPWR\_LEVEL parameter are in the range from 1 to numberOfOctets(dot11TxPowerLevelExtended)/2. This parameter is used to indicate which of the available transmit output power levels defined in dot11TxPowerLevelExtended shall be used for the current transmission.~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | The allowed values for the TXPWR\_LEVEL parameter are in the range from 1 to numberOfOctets(dot11TxPowerLevelExtended)/2. This parameter is used to indicate which of the available transmit output power levels defined in dot11TxPowerLevelExtended shall be used for the current transmission. (#1136) | Y | | N |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| RSSI | ~~FORMAT is S1G~~ | ~~The allowed values for the RSSI parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antenna connectors(#140) used to receive the current PPDU measured during the reception of the LTF field. RSSI is intended to be used in a relative manner, and it is a monotonically increasing function of the received power.~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~The allowed values for the RSSI parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antenna connectors(#140) used to receive the current PPDU measured during the reception of the LTF field. RSSI is intended to be used in a relative manner, and it is a monotonically increasing function of the received power.~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~The allowed values for the RSSI parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antenna connectors(#140) used to receive the current PPDU measured during the reception of the LTF field. RSSI is intended to be used in a relative manner, and it is a monotonically increasing function of the received power.~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | The allowed values for the RSSI parameter are in the range 0 to 255 inclusive. This parameter is a measure by the PHY of the power observed at the antenna connectors(#140) used to receive the current PPDU measured during the reception of the LTF field. RSSI is intended to be used in a relative manner, and it is a monotonically increasing function of the received power. (#1136) | N | | Y |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| MCS | FORMAT is S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) | Indicates the modulation and coding scheme used in the transmission of the PPDU.  Integer: range 0 to 9 | MU | | Y |
| FORMAT is S1G\_DUP\_2M | Indicates the modulation and coding scheme used in the transmission of the PPDU.  Integer: range 0 to 9 | ~~MU~~  Y | | Y |
| ~~FORMAT is S1G and CH\_BANDWIDTH equals CBW1~~ | ~~Indicates the modulation and coding scheme used in the transmission of the PPDU.~~  ~~Integer: range 0 to 10~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates the modulation and coding scheme used in the transmission of the PPDU.~~  ~~Integer: range 0 to 10~~ | ~~Y~~ | | ~~Y~~ |
| Otherwise | Indicates the modulation and coding scheme used in the transmission of the PPDU.  Integer: range 0 to 10 (#1136) | Y | | Y |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| REC\_MCS | ~~FORMAT is S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16)~~ | ~~Indicates the MCS that the STA’s receiver recommends.~~  ~~Integer: range 0 to 9~~ | ~~N~~ | | ~~O~~ |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Indicates the MCS that the STA’s receiver recommends.~~  ~~Integer: range 0 to 9~~ | ~~N~~ | | ~~O~~ |
| FORMAT is (S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16)) or S1G\_DUP\_2M | Indicates the MCS that the STA’s receiver recommends.  Integer: range 0 to 9 | N | | O |
| ~~FORMAT is S1G and CH\_BANDWIDTH equals CBW1~~ | ~~Indicates the MCS that the STA’s receiver recommends.~~  ~~Integer: range 0 to 10~~ | ~~N~~ | | ~~O~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates the MCS that the STA’s receiver recommends.~~  ~~Integer: range 0 to 10~~ | ~~N~~ | | ~~O~~ |
| Otherwise | Indicates the MCS that the STA’s receiver recommends.  Integer: range 0 to 10 (#1136) | N | | O |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| CH\_BANDWIDTH | FORMAT is S1G | Indicates the channel width of the transmitted PPDU:  Enumerated type:  CBW1 for 1 MHz  CBW2 for 2 MHz  CBW4 for 4 MHz  CBW8 for 8 MHz  CBW16 for 16 MHz | Y | | Y |
| FORMAT is S1G\_DUP\_2M | In TXVECTOR, indicates the channel width of the transmitted 2 MHz Duplicate PPDU.  In RXVECTOR, indicates the estimated channel width of the 2 MHz Duplicate received PPDU.  Enumerated type:  CBW4 for 4 MHz  CBW8 for 8 MHz  CBW16 for 16 MHz | Y | | Y |
| FORMAT is S1G\_DUP\_1M | In TXVECTOR, indicates the channel width of the transmitted 1 MHz Duplicate PPDU.  In RXVECTOR, indicates the estimated channel width of the 1 MHz Duplicate received PPDU.  Enumerated type:  CBW2 for 2 MHz  CBW4 for 4 MHz  CBW8 for 8 MHz  CBW16 for 16 MHz | Y | | Y |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ (#1136) | | | |
| LENGTH | FORMAT is S1G and AGGREGATION is AGGREGATED | Indicates the packet duration in number of symbols in the S1G PSDU. | Y | | Y |
| FORMAT is S1G\_DUP\_2M and AGGREGATION is AGGREGATED | Indicates the packet duration in number of symbols in the S1G 2 MHz Duplicate PSDU. | Y | | Y |
| FORMAT is S1G\_DUP\_1M and AGGREGATION is AGGREGATED | Indicates the packet duration in number of symbols in the S1G 1 MHz Duplicate PSDU. | Y | | Y |
| FORMAT is S1G and AGGREGATION is NOT\_AGGREGATED | Indicates the packet duration in number of octets in the S1G PSDU. | Y | | Y |
| FORMAT is S1G\_DUP\_2M and AGGREGATION is NOT\_AGGREGATED | Indicates the packet duration in number of octets in the S1G 2 MHz Duplicate PSDU. | Y | | Y |
| FORMAT is S1G\_DUP\_1M and AGGREGATION is NOT\_AGGREGATED | Indicates the packet duration in number of octets in the S1G 1 MHz Duplicate PSDU. | Y | | Y |
| ~~AGGREGATION is NOT\_AGGREGATED~~ | ~~It indicates the packet duration in number of octets defined in 23.4.3 (TXTIME and PSDU\_LENGTH calculation) PSDU\_LENGTH parameter~~ | ~~Y~~ | | ~~Y~~ |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| APEP\_LENGTH | FORMAT is S1G | If equal to 0, indicates an S1G NDP PPDU for both RXVECTOR and TXVECTOR.  If greater than 0 in the TXVECTOR, indicates the number of octets in the A-MPDU pre-EOF padding (see 10.12.2) carried in the PSDU. This parameter is used to determine the number of OFDM symbols in the Data field that do not appear after a subframe with 1 in the EOF subfield. | MU | | O |
| ~~Otherwise~~ | ~~See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ | | | |
| PSDU\_LENGTH | FORMAT is S1G | Indicates the number of octets in the S1G PSDU. A value of 0 indicates an S1G NDP PPDU | MU | | Y |
| FORMAT is S1G\_DUP\_2M | Indicates the number of octets in the S1G 2 MHz Duplicate PSDU. A value of 0 indicates an S1G NDP PPDU. | Y | | Y |
| FORMAT is S1G\_DUP\_1M | Indicates the number of octets in the S1G 1 MHz Duplicate PSDU. A value of 0 indicates an S1G NDP PPDU. | Y | | Y |
| ~~Otherwise~~ | ~~(Ed)See corresponding entry in Table 19-1 (TXVECTOR and RXVECTOR parameters) and Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ (#1136) | | | |
| USER\_POSITION | FORMAT is S1G and  (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and MU\_SU equals MU | Index for user in MU transmission. Integer: range 0–3.  NOTE—The entries in the USER\_POSITION array are in ascending order. | Y | | Y |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals MU~~ | ~~Index for user in MU transmission. Integer: range 0–3.~~  ~~NOTE—The entries in the USER\_POSITION array are in ascending order.~~ | ~~Y~~ | | ~~Y~~ |
|
| Otherwise | Not present | N | N | |
| NUM\_STS | FORMAT is S1G | Indicates the number of space-time streams.  Integer: range 1–4 per user in the TXVECTOR and 0–4 in the RXVECTOR.  NUM\_STS summed over all users is in the range 1 to 4 for MU-MIMO. | MU | | Y |
| ~~FORMAT is S1G\_DUP\_2M~~ | ~~Indicates the number of space-time streams.~~  ~~Integer: range 1–4 per user in the TXVECTOR and 0–4 in the RXVECTOR.~~  ~~NUM\_STS summed over all users is in the range 1 to 4 for MU-MIMO.~~ | ~~MU~~  ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Indicates the number of space-time streams.~~  ~~Integer: range 1–4 per user in the TXVECTOR and 0–4 in the RXVECTOR.~~ | ~~Y~~ | | ~~Y~~ |
| FORMAT is S1G\_DUP\_2M or S1G\_DUP\_1M | Indicates the number of space-time streams.  Integer: range 1–4 per user in the TXVECTOR and 0–4 in the RXVECTOR. | Y | | Y |
| ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ (#1136) | | | |
| GROUP\_ID | FORMAT is S1G and  (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and MU\_SU equals MU | Indicates the group ID.  Integer: range 1–62 (see Table 23-14 (Fields in the SIG-A field of S1G\_LONG preamble MU PPDU (11ah)) in  23.3.8.2.2.1.5). | Y | | Y |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals MU~~ | ~~Indicates the group ID.~~  ~~Integer: range 1–62 (see Table 23-14 (Fields in the SIG-A field of S1G\_LONG preamble MU PPDU (11ah)) in~~  ~~23.3.8.2.2.1.5).~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G and MU\_SU equals SU~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals SU~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G and CH\_BANDWIDTH equals CBW1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| Otherwise | Not present | N | | N |
| ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ (#1136) | | | |
| PARTIAL\_AID | ~~FORMAT is S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and MU\_SU equals SU~~ | ~~Provides an abbreviated indication of the intended recipient(s) of the PSDU (see 10.21).~~  ~~Integer: range 0–511 if UPLINK\_INDICATION is 1, and range 0–63 if UPLINK\_INDICATION is 0.~~ | ~~Y~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals SU~~ | ~~Provides an abbreviated indication of the intended recipient(s) of the PSDU (see 10.21).~~  ~~Integer: range 0–511 if UPLINK\_INDICATION is 1, and range 0–63 if UPLINK\_INDICATION is 0.~~ | ~~Y~~ | | ~~Y~~ |
| FORMAT is (S1G and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and MU\_SU equals SU) or S1G\_DUP\_2M | Provides an abbreviated indication of the intended recipient(s) of the PSDU (see 10.21).  Integer: range 0–511 if UPLINK\_INDICATION is 1, and range 0–63 if UPLINK\_INDICATION is 0. | Y | | Y |
| ~~FORMAT is S1G and MU\_SU equals MU~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals MU~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G and~~  ~~(CH\_BANDWIDTH equals CBW1~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| Otherwise | Not present | N | | N |
| ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ (#1136) | | | |
| NUM\_USERS | FORMAT is S1G and  (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and  MU\_SU equals MU | Indicates the number of users with nonzero space-time streams.  Integer: range 1 to 4. | Y | | N |
| ~~FORMAT is S1G and MU\_SU equals SU~~ | ~~Set to 1~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals MU~~ | ~~Indicates the number of users with nonzero space-time streams.~~  ~~Integer: range 1 to 4.~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals SU~~ | ~~Set to 1~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G and CH\_BANDWIDTH equals CBW1~~ | ~~Set to 1~~ | ~~Y~~ | | ~~N~~ |
| ~~FORMAT is S1G\_DUP\_1M~~ | ~~Set to 1~~ | ~~Y~~ | | ~~N~~ |
| Otherwise | Set to 1 | Y | | N |
| ~~Otherwise~~ | ~~See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters).~~ (#1136) | | | |
| BEAM\_CHANGE | FORMAT is S1G and MU\_SU equals SU and (CH\_BANDWIDTH equals CBW2 or CBW4 or CBW8 or CBW16) and PREAMBLE\_TYPE equals S1G\_LONG\_PREAMBLE and NUM\_STS is 1. | Set to 1 if the Q matrix is changed from the omnidirectional portion to the beam changeable portion of the long preamble, in at least one of the nonzero (Ed)subcarrier of the omnidirectional portion as described in 23.3.8.2.2.1.5 (SIG-A  definition).  Set to 0 if the Q matrix is unchanged in all the nonzero sub-carriers of the omnidirectional portion.  NOTE—If BEAM\_CHANGE is 0 and PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE, the receiver may do channel smoothing. Otherwise, smoothing is not recommended. | Y | | Y |
| ~~FORMAT is S1G\_DUP\_2M and MU\_SU equals SU and PREAMBLE\_TYPE equals S1G\_LONG\_PREAMBLE and NUM\_STS is 1.~~ | ~~Set to 1 if the Q matrix is changed from the omnidirectional portion to the beam changeable portion of the long preamble, in at least (Ed)one of the nonzero (Ed)subcarrier of the omnidirectional portion as described in 23.3.8.2.2.1.5 (SIG-A definition).~~  ~~Set to 0 if the Q matrix is unchanged in all the nonzero sub-carriers of the omnidirectional portion.~~  ~~NOTE—If BEAM\_CHANGE is 0 and PREAMBLE\_TYPE is S1G\_LONG\_PREAMBLE, the receiver may do channel smoothing. Otherwise, smoothing is not recommended.~~ | ~~Y~~ | | ~~Y~~ |
| Otherwise | Not present | N | | N |
| RESPONSE\_INDICATION | ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Set to 0 if No Response.  Set to 1 if NDP Response.  Set to 2 if Normal Response.  Set to 3 if Long Response. | Y | | Y |
| ~~Otherwise~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| TRAVELING\_PILOTS | ~~FORMAT is S1G, S1G\_DUP\_2M, or S1G\_DUP\_1M~~ | Set to 1 if traveling pilots are used in the packet.  Set to 0 otherwise. | Y | | O |
| ~~Otherwise~~ | ~~Not present~~ | ~~N~~ | | ~~N~~ |
| TIME\_OF\_DEPARTURE\_REQUESTED |  | Boolean value:  True indicates that the MAC entity requests that the PHY entity measures and reports time of departure parameters corresponding to the time when the first PPDU energy is sent by the transmitting port.  False indicates that the MAC entity requests that the PHY entity neither measures nor reports time of departure parameters. | O | | N |
| RX\_START\_OF\_ FRAME\_OFFSET | dot11MgmtOptionTimingMsmtActivated is true | 0 to 232– 1. An estimate of the offset (in 10 ns units) from the point in time at which the start of the preamble corresponding to the incoming frame arrived at the receive antenna port to the point in time at which this primitive is issued to the MAC. | N | | Y |
| Otherwise | Not present | N | | N |
| UPLINK\_INDICATION | NDP\_INDICATION is 0 and FORMAT is S1G and CH\_BANDWIDTH is not equal to CBW1 | Set to 1 if the S1G PPDU is addressed to AP  Set to 0 otherwise  (See 10.21). | Y | | Y |
| Otherwise | Not present | N | | N |
| COLOR | UPLINK\_INDICATION is 0 and NDP\_INDICATION is 0 and FORMAT is S1G or S1G\_DUP\_2M and CH\_BANDWIDTH is not equal to CBW1 and MU\_SU is SU. | Set to a value of its choosing within the range 0 to 7 ~~and shall maintain that value for the duration of the existence of the BSS~~ (See 10.21) | Y | | Y |
| Otherwise | Not present | N | | N |
| SCRAMBLER\_OR\_CRC | ~~FORMAT is S1G and NDP\_INDICATION is 0~~ | ~~Indicates the Scrambler Initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling.~~  ~~Bit sequence of 7 bits in length: [B0:B6] of the SERVICE field value prior to descrambling.~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_2M and NDP\_INDICATION is 0~~ | ~~Indicates the Scrambler Initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling.~~  ~~Bit sequence of 7 bits in length: [B0:B6] of the SERVICE field value prior to descrambling.~~ | ~~N~~ | | ~~Y~~ |
| ~~FORMAT is S1G\_DUP\_1M and NDP\_INDICATION is 0~~ | ~~Indicates the Scrambler Initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling.~~  ~~Bit sequence of 7 bits in length: [B0:B6] of the SERVICE field value prior to descrambling.~~ | ~~N~~ | | ~~Y~~ |
| NDP\_INDICATION is 0 | Indicates the Scrambler Initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling.  Bit sequence of 7 bits in length: [B0:B6] of the SERVICE field value prior to descrambling. (#1136) | N | | Y |
| FORMAT is S1G and NDP\_INDICATION is 1 | Indicates the value of the calculated CRC in the SIG field.  Bit sequence of 4 bits in length: Either [B26:B29] of the 1 MHz SIG field or [B38:B41] of the ≥ 2 MHz SIG field. | N | | Y |
| FORMAT is S1G\_DUP\_2M and NDP\_INDICATION is 1 | Indicates the value of the calculated CRC in the SIG field.  Bit sequence of 4 bits in length: [B38:B41] of the ≥ 2 MHz SIG field. | N | | Y |
| FORMAT is S1G\_DUP\_1M and NDP\_INDICATION is 1 | Indicates the value of the calculated CRC in the SIG field.  Bit sequence of 4 bits in length: [B26:B29] of the 1 MHz SIG field. | N | | Y |
| Otherwise | Not present | N | | N~~Y~~ |
| NOTE—In the “TXVECTOR” and “RXVECTOR” columns, the following apply:  Y = Present;  N = Not present;  O = Optional whether to be present or not  MU indicates that the parameter is present once for an S1G SU PPDU and present per user for an S1G MU PPDU. Parameters specified to be present per user are conceptually supplied as an array of values indexed by *u*, where *u* takes values 0 to NUM\_USERS-1. | | | | | |

***------------- End Text Changes ---------------***