**IEEE P802.15**

**Wireless Personal Area Networks**

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| Abstract | [Proposal to IEEE 802.15.4j MBAN MAC enhancement] |
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**5. General description**

**5.5.3.1 Beacon frame**

***Change in 5.5.3.1 the first paragraph and the Figure 10 as follows:***

Figure 10 shows the structure of the beacon frame, which originates from within the MAC sublayer. A coordinator can transmit network beacons in a beacon-enabled PAN. The MAC payload contains the superframe specification, GTS fields, pending address fields, Channel Switch Information Fields, and beacon payload (see 7.2.2.1). The MAC payload is prefixed with a MAC header (MHR) and appended with a MAC footer (MFR). The MHR contains the MAC Frame Control field, beacon sequence number (BSN), addressing fields, and optionally the auxiliary security header. The MFR contains a 16-bit frame check sequence (FCS). The MHR, MAC payload, and MFR together form the MAC beacon frame (i.e., MPDU).



**Figure 10 — Schematic view of the beacon frame and the PHY packet**

**6. PHY specification**

**6.1 General requirements and definitions**

***Change in 6.1 the fourth paragraph and the bullet list as follows:***

The standard specifies the following five PHYs:

— An 868/915 MHz direct sequence spread spectrum (DSSS) PHY employing binary phase-shift

keying (BPSK) modulation

— An 868/915 MHz DSSS PHY employing offset quadrature phase-shift keying (O-QPSK)

modulation

— An 868/915 MHz parallel sequence spread spectrum (PSSS) PHY employing BPSK and amplitude shift keying (ASK) modulation

— A 2380 MHz DSSS PHY employing O-QPSK modulation

— A 2450 MHz DSSS PHY employing O-QPSK modulation

**6.1.1 Operating frequency range**

***Change in 6.1.1 the Table 1 as follows:***

**Table 1 — Frequency bands and data rates**

|  |  |  |  |
| --- | --- | --- | --- |
| **PHY (MHz)** | **Frequency band (MHz)** | **Spreading parameters** | **Data parameters** |
| **Chip rate (kchip/s)** | **Modulation** | **Bit rate (kb/s)** | **Symbol rate (ksymbol/s)** | **Symbols** |
| 868/915 | 868-868.6 | 300 |  BPSK | 20 | 20 |  Binary |
| 902-928 | 600 |  BPSK | 40 | 40 |  Binary |
| 868/915(optional) | 868-868.6 | 400 |  ASK | 250 | 12.5 |  20-bit PSSS |
| 902-928 | 1600 |  ASK | 250 | 50 |  5-bit PSSS |
| 868/915(optional) | 868-868.6 | 400 |  O-QPSK | 100 | 25 |  16-ary Orthogonal |
| 902-928 | 1000 |  O-QPSK | 250 | 62.5 |  16-ary Orthogonal |
| 2380 | 2360-2400 | 2000 |  O-QPSK | 250 | 62.5 |  16-ary Orthogonal |
| 2450 | 2400-2483.5 | 2000 |  O-QPSK | 250 | 62.5 |  16-ary Orthogonal |

**6.1.2.1 Channel numbering**

***Insert in 6.1.2.1 before the last paragraph the following paragraph as follows:***

For channel page 3, 9 channels numbered 0 to 8 are available in the 2380 MHz band. The center frequency of these channels is defined as follows:

*Fc* = 2363 + 5 (*k*-1) in megahertz, for *k* = 0, 1, …, 5

and *Fc* = 2393 + 2 (*k*-1) in megahertz, for *k* = 6, 7, 8

where

*k* is the channel number.

**6.1.2.2 Channel pages**

***Change in 6.1.2.2 the first paragraph and the Table 2 as follows:***

A total of 32 channel pages are available with channel pages 4 to 31 being reserved for future use. The

*phyPagesSupported* PHY PAN information base (PIB) attribute indicates which channel pages are supported by the current PHY, while the *phyCurrentPage* PHY PIB attribute identifies the channel page that is currently used. The PHY PIB attributes are described in 6.4.2.

**Table 2 — Channel page and channel number**

|  |  |  |  |
| --- | --- | --- | --- |
| Channel page(decimal) | Channel page(binary)(b31, b30, b29, b28, b27) | Channelnumber(s)(decimal) | Channel number description |
| 0 | 0 0 0 0 0 | 0 |  Channel 0 is in 868 MHz band using BPSK |
| 1–10 |  Channels 1 to 10 are in 915 MHz band using BPSK |
| 11–26 |  Channels 11 to 26 are in 2.4 GHz band using O-QPSK |
| 1 | 0 0 0 0 1 | 0 |  Channel 0 is in 868 MHz band using ASK |
| 1–10 |  Channels 1 to 10 are in 915 MHz band using ASK |
| 11–26 |  Reserved |
| 2 | 0 0 0 1 0 | 0 |  Channel 0 is in 868 MHz band using O-QPSK |
| 1–10 |  Channels 1 to 10 are in 915 MHz band using O-QPSK |
| 11–26 |  Reserved |
| 3 | 0 0 0 1 1 | 0–8 |  Channels 0 to 8 are in 2380 MHz band using O-QPSK |
| 9–26 |  Reserved |
| 4-31 | 0 0 1 0 0 - 1 1 1 1 1 | reserved |  Reserved |

**7. MAC sublayer specification**

**7.1 MAC sublayer service specification**

**7.1.2 MAC management service**

***Change in 7.1.2 the Table 46 as follows:***

**Table 46 — Summary of the primitives accessed through the MLME-SAP**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Request** | **Indication** | **Response** | **Confirm** |
|  MLME-ASSOCIATE |  7.1.3.1 |  7.1.3.2♦ |  7.1.3.3♦ |  7.1.3.4 |
|  MLME-DISASSOCIATE |  7.1.4.1 |  7.1.4.2 |  |  7.1.4.3 |
|  MLME-BEACON-NOTIFY |  |  7.1.5.1 |  |  |
|  MLME-GET |  7.1.6.1 |  |  |  7.1.6.2 |
|  MLME-GTS |  7.1.7.1\* |  7.1.7.3\* |  |  7.1.7.2\* |
|  MLME-ORPHAN |  |  7.1.8.1♦ |  7.1.8.2♦ |  |
|  MLME-RESET |  7.1.9.1 |  |  |  7.1.9.2 |
|  MLME-RX-ENABLE |  7.1.10.1\* |  |  |  7.1.10.2\* |
|  MLME-SCAN |  7.1.11.1 |  |  |  7.1.11.2 |
|  MLME-COMM-STATUS |  |  7.1.12.1 |  |  |
|  MLME-SET |  7.1.13.1 |  |  |  7.1.13.2 |
|  MLME-START |  7.1.14.1♦ |  |  |  7.1.14.2♦ |
|  MLME-SYNC |  7.1.15.1\* |  |  |  |
|  MLME-SYNC-LOSS |  |  7.1.15.2 |  |  |
|  MLME-POLL |  7.1.16.1 |  |  |  7.1.16.2 |
|  MLME-CHANNELSWICH |  7.1.17.1 |  7.1.17.2 |  |  7.1.17.3 |

**7.1.5 Beacon notification primitive**

**7.1.5.1 MLME-BEACON-NOTIFY.indication**

**7.1.5.1.1 Semantics of the service primitive**

***Change in 7.1.5.1.1 the first paragraph and the Table 54 as follows:***

The semantics of the MLME- BEACON-NOTIFY.indication primitive are as follows:

MLME-BEACON-NOTIFY.indication (

BSN,

PANDescriptor,

PendAddrSpec,

AddrList,

ChannelSwitchInfo,

sdulength,

sdu

)

**Table 54 — MLME-BEACON-NOTIFY.indication parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| BSN | Integer | 0x00-0xff | The beacon sequence number. |
| PANDescriptor | PANDescriptor value | See Table 55 | The PANDescriptor for the received beacon. |
| PendAddrSpec | Bitmap | See 7.2.2.1.6 | The beacon pending address specification. |
| AddrList | List of device addresses | – | The list of addresses of the devices for which the beacon source has data. |
| ChannelSwitchInfo | ChannelSwitch Information value | See 7.2.2.1.8 | The channel switch information for the received beacon. |
| sduLength | Integer | 0 - *aMaxBeaconPayloadLength* | The number of octets contained in the beacon payload of the beacon frame received by the MAC sublayer. |
| sdu | Set of octets | – | The set of octets comprising the beacon payload to be transferred from the MAC sublayer entity to the next higher layer. |

***Insert before 7.1.17 the following subclauses:***

**7.1.17 Channel switch primitives**

The MLME-SAP channel switch primitives define how a MBAN device can switch operating channel.

All MBAN devices shall provide an interface for these channel switch primitives

**7.1.17.1 MLME-CHANNELSWITCH.request**

The MLME- CHANNELSWITCH.request primitive is used by the coordinator to instruct an associated MBAN device to switch operating channel.

**7.1.17.1.1 Semantics of the service primitive**

The semantics of the MLME- CHANNELSWITCH.request primitive are as follows:

MLME-CHANNELSWITCH.request (

DeviceAddrMode,

DevicePANId,

DeviceAddress,

ChannelSwitchInfo,

TxIndirect,

SecurityLevel,

KeyIdMode,

KeySource,

KeyIndex

)

Table 78a specifies the parameters for the MLME-CHANNELSWITCH.request primitive.

**Table 78a— MLME-CHANNELSWITCH.request parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| DeviceAddrMode | Integer | 0x02–0x03 | The addressing mode of the device which should change its operating channel |
| DevicePANId | Integer | 0x0000–0xffff | The PAN identifier of the device which should change its operating channel |
| DeviceAddress | Device address | As specified by the DeviceAddrMode parameter | The address of the device which should change its operating channel |
| ChannelSwitchInfo | ChannelSwitch Information value | See 7.2.2.1.8 | The information for the channel switch. |
| TxIndirect | Boolean | TRUE or FALSE | TRUE if the channel switch command is to be sent indirectly. |
| SecurityLevel | Integer | 0x00–0x07 | The security level to be used (see Table 95 in 7.6.2.2.1). |
| KeyIdMode | Integer | 0x00–0x03 | The mode used to identify the key to be used (see Table 96 in 7.6.2.2.2). This parameter is ignored if the SecurityLevel parameter is set to 0x00. |
| KeySource | Set of 0, 4, or 8 octets | As specified by the KeyIdMode parameter | The originator of the key to be used (see 7.6.2.4.1). This parameter is ignored if the KeyIdMode parameter is ignored or set to 0x00. |
| KeyIndex | Integer | 0x01–0xff | The index of the key to be used (see 7.6.2.4.2). This parameter is ignored if the KeyIdMode parameter is ignored or set to 0x00. |

**7.1.17.1.2 Appropriate usage**

The MLME-CHANNELSWITCH.request primitive is generated by the next higher layer of the coordinator and issued to its MLME to instruct an associated MBAN device to switch its operating channel.

**7.1.17.1.3 Effect on receipt**

On receipt of the MLME- CHANNELSWITCH.request primitive, the MLME compares the DevicePANId parameter with *macPANId*. If the DevicePANId parameter is not equal to *macPANId*, the MLME issues the MLME-CHANNELSWITCH.confirm primitive with a status of INVALID\_PARAMETER. If the DevicePANId parameter is equal to *macPANId*, the MLME evaluates the primitive address fields.

If the DeviceAddrMode parameter is equal to 0x02 and the DeviceAddress parameter is equal to *macCoordShortAddress* or if the DeviceAddrMode parameter is equal to 0x03 and the DeviceAddress parameter is equal to *macCoordExtendedAddress*, the TxIndirect parameter is ignored, and the MLME issues the MLME-CHANNELSWITCH.confirm primitive with a status of INVALID\_PARAMETER.

If the DeviceAddrMode parameter is equal to 0x02 and the DeviceAddress parameter is not equal to *macCoordShortAddress* or if the DeviceAddrMode parameter is equal to 0x03 and the DeviceAddress parameter is not equal to *macCoordExtendedAddress*, and if this primitive was received by the MLME of a coordinator with the TxIndirect parameter set to TRUE, the channel switch notification command will be sent using indirect transmission, i.e., the command frame is added to the list of pending transactions stored on the coordinator and extracted at the discretion of the device concerned using the method described in 7.5.6.3.

If the DeviceAddrMode parameter is equal to 0x02 and the DeviceAddress parameter is not equal to *macCoordShortAddress* or if the DeviceAddrMode parameter is equal to 0x03 and the DeviceAddress parameter is not equal to *macCoordExtendedAddress*, and if this primitive was received by the MLME of a coordinator with the TxIndirect parameter set to FALSE, the MLME sends a channel switch notification command to the device in the CAP for a beacon-enabled PAN or immediately for a nonbeacon-enabled PAN.

If the DeviceAddrMode parameter is equal to 0x02 and the DeviceAddress parameter is equal to broadcast address (0xffff) or if the DeviceAddrMode parameter is equal to 0x03 and the DeviceAddress parameter is equal to broadcast address (0xffffffffffffffff), and if this primitive was received by the MLME of a coordinator with the TxIndirect parameter set to FALSE, the MLME will send the beacon frame containing Channel Switch Information field at the appropriate time.

Otherwise, the MLME issues the MLME-CHANNELSWITCH.confirm primitive with a status of INVALID\_PARAMETER and does not generate a channel switch notification command or beacon frame containing Channel Switch Information field.

If the channel switch command is to be sent using indirect transmission and there is no capacity to store the transaction, the MLME will discard the frame and issue the MLME-CHANNELSWITCH.confirm primitive with a status of TRANSACTION\_OVERFLOW. If there is capacity to store the transaction, the coordinator will add the information to the list. If the transaction is not handled within *macTransaction-PersistenceTime*, the transaction information will be discarded, and the MLME will issue theMLME-CHANNELSWITCH.confirm with a status of TRANSACTION\_EXPIRED. The transaction handling procedure is described in 7.5.5. If the channel switch notification command cannot be sent due to a CSMA-CA algorithm failure and this primitive was received with the TxIndirect parameter set to FALSE the MLME will issue the MLME-CHANNELSWITCH.confirm primitive with a status of CHANNEL\_ACCESS\_FAILURE.

If the SecurityLevel parameter is set to a valid value other than 0x00, indicating that security is required for this frame, the MLME will set the Security Enabled subfield of the Frame Control field to one. The MAC sublayer will perform outgoing processing on the frame based on the DeviceAddress, SecurityLevel, KeyIdMode, KeySource, and KeyIndex parameters, as described in 7.5.8.2.1. If any error occurs during outgoing frame processing, the MLME will discard the frame and issue the MLME-CHANNELSWITCH.confirm primitive with the error status returned by outgoing frame processing.

If the MLME successfully transmits a channel switch notification command, the MLME will expect an acknowledgment in return. If an acknowledgment is not received and this primitive was received with the TxIndirect parameter set to FALSE and DeviceAddress parameter is not equal to broadcast address, the MLME will issue the MLME-CHANNELSWITCH.confirm primitive with a status of NO\_ACK (see 7.5.6.4). If the MLME successfully transmits a channel switch command and receives an acknowledgment in return, the MLME will issue the MLME-CHANNELSWITCH.confirm primitive with a status of SUCCESS.

If the MLME successfully transmits a beacon frame containing Channel Switch Information field and receives a corresponding channel switch notification frame, the MLME will send an acknowledgment of channel switch notification frame and then issue the MLME-CHANNELSWITCH.confirm primitive with a status of SUCCESS. On receipt of the channel switch command, the MLME of the recipient issues the MLME-CHANNELSWITCH.indication primitive.

If any parameter in the MLME-CHANNELSWITCH.request primitive is not supported or is out of range, the MLME will issue the MLME-CHANNELSWITCH.confirm primitive with a status of INVALID\_PARAMETER.

**7.1.17.2 MLME-CHANNELSWITCH.indication**

The MLME-CHANNELSWITCH.indication primitive is used to indicate the reception of a channel switch notification command or a beacon frame containing Channel Switch Information field.

**7.1.17.2.1 Semantics of the service primitive**

The semantics of the MLME-CHANNELSWITCH.indication primitive are as follows:

MLME-CHANNELSWITCH.indication (

ChannelSwitchInfo,

SecurityLevel,

KeyIdMode,

KeySource,

KeyIndex

)

Table 78b specifies the parameters for the MLME-CHANNELSWITCH.indication primitive.

**Table 78b— MLME-CHANNELSWITCH.indication parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| ChannelSwitchInfo | ChannelSwitch Information value | See 7.2.2.1.8 | The information for the channel switch. |
| SecurityLevel | Integer | 0x00–0x07 | The security level purportedly used by the received MAC command frame (see Table 95 in 7.6.2.2.1). |
| KeyIdMode | Integer | 0x00–0x03 | The mode used to identify the key purportedly used by the originator of the received frame (see Table 96 in 7.6.2.2.2). This parameter is invalid if the SecurityLevel parameter is set to 0x00. |
| KeySource | Set of 0, 4, or 8 octets | As specified by the KeyIdMode parameter | The originator of the key purportedly used by the originator of the received frame (see 7.6.2.4.1). This parameter is invalid if the KeyIdMode parameter is invalid or set to 0x00. |
| KeyIndex | Integer | 0x01–0xff | The index of the key purportedly used by the originator of the received frame (see 7.6.2.4.2). This parameter is invalid if the KeyIdMode parameter is ignored or set to 0x00. |

**7.1.17.2.2 When generated**

The MLME-CHANNELSWITCH.indication primitive is generated by the MLME and issued to its next higher layer on receipt of a channel switch notification command or a beacon frame containing Channel Switch Information field.

**7.1.17.2.3 Appropriate usage**

The next higher layer is notified of the information for the channel switch.

**7.1.17.3 MLME-CHANNELSWITCH.confirm**

The MLME-CHANNELSWITCH.confirm primitive reports the results of an MLME-CHANNELSWITCH.request primitive.

**7.1.4.3.1 Semantics of the service primitive**

The semantics of the MLME-CHANNELSWITCH.confirm primitive are as follows:

MLME-CHANNELSWITCH.confirm (

status

)

Table 78c specifies the parameters for the MLME-CHANNELSWITCH.confirm primitive.

**Table 78c— MLME-CHANNELSWITCH.confirm parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Valid range | Description |
| status | Enumeration | SUCCESS, TRANSACTION\_OVERFLOW, TRANSACTION\_EXPIRED, NO\_ACK, CHANNEL\_ACCESS\_FAILURE, COUNTER\_ERROR, FRAME\_TOO\_LONG, UNAVAILABLE\_KEY, UNSUPPORTED\_SECURITY or INVALID\_PARAMETER | The status of the channel switch notification attempt. |

**7.1.17.3.2 When generated**

The MLME-CHANNELSWITCH.confirm primitive is generated by the initiating MLME and issued to its next higher layer in response to an MLME-CHANNELSWITCH.request primitive. This primitive returns a status of either SUCCESS, indicating that the channel switch notification request was successful, or the appropriate error code. The status values are fully described in 7.1.17.1.3 and subclauses referenced by 7.1.17.1.3.

**7.1.17.3.3 Appropriate usage**

On receipt of the MLME-CHANNELSWITCH.confirm primitive, the next higher layer of the initiating device is notified of the result of the channel switch notification attempt. If the channel switch notification attempt was successful, the status parameter will be set to SUCCESS. Otherwise, the status parameter indicates the error.

**7.1.17.4 Channel switch message sequence charts**

The request to channel switch notification may originate from the coordinator through which the device has associated. Figure 41a illustrates the sequence of messages necessary for a device to successfully channel switch notification when TxIndirect is equal to TRUE. Figure 41b illustrates the sequence of messages necessary for a device to successfully channel switch notification when TxIndirect is equal to FALSE.



**Figure 41a— Message sequence chart for channel switch notification when TxIndirect is equal to TRUE**



**Figure 41b— Message sequence chart for channel switch notification when TxIndirect is equal to FALSE**

**7.2 MAC frame formats**

**7.2.2.1 Beacon frame format**

***Change in 7.2.2.1 the Figure 44, insert in 7.2.2.1 the Figure47a as follows:***



**Figure 44— Beacon frame format**



**Figure 47a— Format of the Channel Switch Information fields**

**7.2.2.1.3 GTS Specification field**

***Change in 7.2.2.1.3 the second paragraph as follows:***

The GTS Descriptor Count subfield is 3 bits in length and specifies the number of 4-octet GTS descriptors contained in the GTS List field of the beacon frame. If the value of this subfield is greater than zero, the size of the CAP shall be allowed to dip below *aMinCAPLength* to accommodate the temporary increase in the beacon frame length caused by the inclusion of the subfield. If the value of this subfield is zero, the GTS Directions field and GTS List field of the beacon frame are not present.

**7.2.2.1.5 GTS List field**

***Change in 7.2.2.1.5 the second paragraph and the Figure 50 as follows:***

Each GTS descriptor is 32 bits in length and shall be formatted as illustrated in Figure 50.



**Figure 50— Format of the GTS descriptor**

***Insert in 7.2.2.1.5 after the last paragraph the following text:***

The GTS Starting BSN subfield is 6 bits in length and contains the lower 6 least significant bits (LSBs) of the beacon sequence number of which beacon contains first allocated GTS slot.

The GTS Interval subfield is 2 bits in length and contains the interval of allocated GTS slot. The unit of GTS Interval subfield is beacon period.

***Insert before 7.2.2.1.8 the following subclauses:***

**7.2.2.1.8 Channel Switch Information field**

The Channel Switch Information field shall be formatted as illustrated in Figure 47a.

The Timestamp subfield is 6 octets in length and contains the time at which the channel switching will be occurred, in symbols. This is a 24-bit value, and the precision of this value shall be a minimum of 20 bits, with the lowest 4 bits being the least significant.

The Logical Channel subfield is 8 bits in length and contains the logical channel which is chosen by the coordinator and the MBAN device shall switch to.

The Channel Page subfield, if present, is 8 bits in length and contains the channel page which is chosen by the coordinator and the MBAN device shall switch to.

**7.2.2.1.9 Beacon Payload field**

**7.3 MAC command formats**

***Change in 7.3 the second paragraph and the Table 82 as follows:***

How the MLME shall construct the individual commands for transmission is detailed in 7.3.1 through 7.3.10. MAC command reception shall abide by the procedure described in 7.5.6.2.

**Table 82 — MAC command frames**

|  |  |  |  |
| --- | --- | --- | --- |
| Command frame identifier | Command name | RFD | Subclause |
| Tx | Rx |
| 0x01 | Association request | X |  | 7.3.1 |
| 0x02 | Association response |  | X | 7.3.2 |
| 0x03 | Disassociation notification | X | X | 7.3.3 |
| 0x04 | Data request | X |  | 7.3.4 |
| 0x05 | PAN ID conflict notification | X |  | 7.3.5 |
| 0x06 | Orphan notification | X |  | 7.3.6 |
| 0x07 | Beacon request |  |  | 7.3.7 |
| 0x08 | Coordinator realignment |  | X | 7.3.8 |
| 0x09 | GTS request |  |  | 7.3.9 |
| 0x0a | Channel switch notification | X | X | 7.3.10 |
| 0x0b-0x0ff | Reserved |  |  | - |

**7.3.9 GTS request command**

**7.3.9.2 GTS Characteristics field**

***Change in 7.3.9.2 the Figure 65 as follow:***



**Figure 65 — GTS Characteristics field format**

***Insert at the end of 7.3.9.2 the following paragraph:***

The GTS Interval subfield shall contain the interval of GTS slots being requested for the GTS. The unit of GTS Interval subfield is beacon period.

***Insert before 7.4 the following subclauses:***

**7.3.10 Channel Switch notification command**

The MBAN PAN coordinator, a MBAN coordinator, or an associated MBAN device may send the channel switch notification command.

All MBAN devices shall implement this command.

The channel switch notification command shall be formatted as illustrated in Figure 66a.



**Figure 66a — Channel Switch notification command format**

**7.3.10.1 MHR fields**

The Destination Addressing Mode subfield of the Frame Control field shall be set according to the addressing mode specified by the corresponding primitive. The Source Addressing Mode subfield shall be set to three (i.e., 64-bit extended addressing).

The Frame Pending subfield of the Frame Control field shall be set to zero and ignored upon reception, and the Acknowledgment Request subfield shall be set to one.

The PAN ID Compression subfield of the Frame Control field shall be set to one. In accordance with this value of the PAN ID Compression subfield, the Destination PAN Identifier field shall contain the value of macPANId, while the Source PAN Identifier field shall be omitted. If the MBAN coordinator wants an associated MBAN device to switch its operating channel, then the Destination Address field shall contain the address of the MBAN device being switched its operating channel. If an associated MBAN device sends the channel switch notification command, then the Destination Address field shall contain the value of either macCoordShortAddress, if the Destination Addressing Mode subfield is equal to two, or macCoordExtendedAddress, if the Destination Addressing Mode subfield is equal to three. The Source Address field shall contain the value of aExtendedAddress.

**7.3.10.2 Channel Switch Information field**

See 7.2.2.1.8

**7.5 MAC functional description**

***Insert before 7.5.8 the following subclauses:***

**7.5.7.7 GTS interval**

A MBAN device can request the allocation of periodic GTS.

To request the allocation of periodic GTS, the MLME shall send the GTS request frame (see 7.3.9) to the MBAN PAN coordinator. The GTS interval subfields shall be set according to the desired characteristics of the requested periodic GTS. The MBAN PAN coordinator shall confirm its receipt by sending an acknowledgement frame.

On receipt of a GTS request command indicating a GTS allocation request, the PAN coordinator shall first check if there is available capacity in the current superframe, based on the remaining length of the CAP and the desired length of the requested GTS. The superframe shall have available capacity if the maximum number of GTSs has not been reached and allocating a GTS of the desired length would not reduce the length of the CAP to less than *aMinCAPLength*. GTSs shall be allocated on a first-come-first-served basis by the PAN coordinator provided there is sufficient bandwidth available.

If the GTS was allocated successfully, the PAN coordinator shall set the start slot in the GTS descriptor to the superframe slot at which the GTS begins, the length in the GTS descriptor to the length of the GTS, GTS Starting BSN in the GTS descriptor to the beacon sequence number of which beacon contains first allocated GTS slot, and GTS interval in the GTS descriptor to the interval of the periodic GTS.

Figure 74a illustrates the basic operation of periodic GTS allocation when GTS interval is equal to 2.



**Figure 74a — Periodic GTS allocation when GTS interval is equal to 2**

**7.5.9 Channel Switch notification command**

TBD (see 7.1.17)