CLAIMS

What is claimed is:

1. A multi-band ~~communication~~ transmitter device comprising:

a ~~plurality of transceivers~~transmitter which, in operation, ~~each~~ transmits to a multi-band recipient device a plurality of MAC layer Protocol Data Units (MPDUs) over ~~signal frames on different ones of a~~a plurality of frequency bands to which a Traffic Identifier (TID) is mapped; and

~~Media Access Control (MAC) circuitry coupled to the plurality of transceivers~~ a receiver which, in operation, receives on a first frequency band a multi-band block ack~~nowledgement~~ frame ~~on~~ indicating reception statuses of the plurality of MPDUs~~one of the plurality of frequency bands acknowledging the signal frames transmitted on the plurality of frequency bands~~.

2. The multi-band ~~communication~~ transmitter device of claim 1, wherein ~~the~~a single ~~MAC circuitry~~ multi-band block ack agreement is established for the TID by exchanging an Add Block Ack (ADDBA) Request ~~ADD Block Ack request~~ frame and an Add Block Ack (ADDBA) Response~~ADD Block Ack response~~ frame on an enabled frequency band~~, in operation, generates a multi-band block acknowledgement request frame and transmits the MAC multi-band block acknowledgement request frame on the one of the plurality of frequency bands to solicit the multi-band block acknowledgement frame~~.

3. The multi-band ~~communication~~ transmitter device of claim 1, wherein the receiver, in operation, receives a per-band Block Ack frame that indicates a reception

status of a subset of the plurality of MPDUs received on a different frequency band~~the transmitted signal frames on the plurality of frequency bands all belong to a single traffic identifier (TID)~~.

4. The multi-band ~~communication~~ transmitter device of claim 1, wherein ~~the multi-band block acknowledgement frame is implicitly solicited in any one of the transmitted signal frames~~the plurality of MPDUs are transmitted on any of the plurality of frequency bands to which the TID is mapped.

5. The multi-band ~~communication~~ transmitter device of claim 1, wherein, in response to receiving the multi~~MAC circuitry determining~~-band block ack frame that indicates failure of reception of ~~one or more signal frames~~a first MPDU transmitted on ~~a~~ the first~~first of the plurality of~~ frequency band~~s~~, the ~~MAC circuitry providing the one or more signal frames to one of the plurality of transceivers which~~transmitter retransmits ~~signal frames~~the first MPDU on a second ~~of the plurality of~~ frequency band~~s~~ different from the first ~~of the plurality of~~ frequency band~~s to retransmit the one or more signal frames on the second of the plurality of frequency bands~~.

6. The multi-band ~~communication~~ transmitter device of claim ~~5~~ 1, wherein the transmitter transmits a multi-band block ack request frame that includes one or more per-band information fields, each of the one or more per-band information fields comprising a TID field for indicating the TID for which the multi-band block ack response is requested~~one or more signal frames retransmitted on the second of the plurality of frequency bands is transmitted in a same format as the one or more signals transmitted on the first of the plurality of frequency bands~~.

7. The multi-band ~~communication~~ transmitter device of claim ~~5~~ 1, wherein ~~the~~ a single reordering buffer is maintained for each set of a MAC address of the multi-band recipient device and the TID~~retransmitted one or more signal frames are~~.

~~8. The multi-band communication device of claim 1 wherein the MAC circuitry, in operation, performs setup of a multi-band Traffic Streams (TS) on the plurality of frequency bands by exchanging a multi-band Add Traffic Streams (ADDTS) Request frame and a multi-band ADDTS Response frame on one of the frequency bands.~~

~~9. The multi-band communication device of claim 8 wherein the multi-band ADDTS Request frame and the multi-band ADDTS Response frame each include information on the plurality of frequency bands for the multi-band TS and MAC addresses used by the circuitry in each of the plurality of frequency bands.~~

~~10. The multi-band communication device of claim 8 wherein the multi-band TS setup allows transmission of signal frames belonging to a Traffic Stream (TS) on any of the frequency bands.~~

~~11~~8. A ~~method for multi-band~~ communication method for a multi-band transmitter device, the communication method comprising:

transmitting to a multi-band recipient device a plurality of MAC layer Protocol Data Units (MPDUs) over ~~signal frames on different ones of~~ a plurality of frequency bands to which a Traffic Identifier (TID) is mapped; and

receiving on a first frequency band a multi-band block ack~~nowledgement~~ frame indicating reception statuses of the plurality of MPDUs ~~on one of the plurality of frequency bands~~.

9. The communication method of claim 8, wherein a single multi-band block ack agreement is established for the TID by exchanging an Add Block Ack (ADDBA) Request frame and an Add Block Ack (ADDBA) Response frame on an enabled frequency band.

10. The communication method of claim 8, comprising:

receiving a per-band Block Ack frame that indicates a reception status of a subset of the plurality of MPDUs received on a different frequency band.

11. The communication method of claim 8, wherein the plurality of MPDUs are transmitted on any of the plurality of frequency bands to which the TID is mapped.

12. The communication method of claim 8, comprising:

in response to receiving the multi-band block ack frame that indicates failure of reception of a first MPDU transmitted on the first frequency band, retransmitting the first MPDU on a second frequency band different from the first frequency band.

13. The multi-band communication method of claim 8, comprising:

transmitting a multi-band block ack request frame that includes one or more per-band information fields, each of the one or more per-band information fields

comprising a TID field for indicating the TID for which the multi-band block ack response is requested.

14. The multi-band communication method of claim 8, wherein a single reordering buffer is maintained for each set of a MAC address of the multi-band recipient device and the TID.

~~12. A multi-band communication device comprising:~~

~~a plurality of transceivers which, in operation, each receive signal frames on different ones of a plurality of frequency bands; and~~

~~MAC circuitry coupled to the plurality of transceivers which, in operation, generates and transmits a multi-band block acknowledgement frame on one of the plurality of frequency bands acknowledging the signal frames received on the plurality of frequency bands.~~

~~13. The multi-band communication device of claim 12 wherein the MAC circuitry, in operation, transmits the multi-band block acknowledgement frame in response to receiving a multi-band block acknowledgement request frame on the one of the plurality of frequency bands.~~

~~14. The multi-band communication device of claim 12 wherein the multi-band block acknowledgement frame includes a consolidated bitmap acknowledging signal frames received on the plurality of frequency bands.~~

~~15. The multi-band communication device of claim 12 wherein the multi-band block acknowledgement frame transmitted on one of the plurality of frequency bands includes bitmaps acknowledging signal frames received on each of the plurality of frequency bands.~~

~~16. The multi-band communication device of claim 12 wherein the multi-band block acknowledgement frame transmitted on one of the plurality of frequency bands includes a bitmap acknowledging signal frames received on another one of the plurality of frequency bands.~~

~~17. The multi-band communication device of claim 12 wherein the MAC circuitry, in operation, initiates setup of a multi-band Block Acknowledgement (BA) agreement on the plurality of frequency bands by transmitting a multi-band ADDBA Request frame on one of the frequency bands and, thereafter, receiving a multi-band ADDBA Response frame on the one of the frequency bands.~~

~~18. The multi-band communication device of claim 17 wherein the multi-band ADDBA Request frame and the multi-band ADDBA Response frame each include information on the plurality of frequency bands for the multi-band BA agreement and MAC addresses used by the circuitry in each of the plurality of frequency bands.~~

~~19. A method for multi-band communication comprising:~~

~~receiving signal frames on different ones of a plurality of frequency bands; and~~

~~transmitting a multi-band block acknowledgement frame on one of the plurality of frequency bands acknowledging the signal frames received on the plurality of frequency bands.~~