CLAIMS

1. A non-Access Point (non-AP) multi-band apparatus comprising:

a transmitter which, in operation, transmits an Association Request frame to an Access Point (AP) multi-band apparatus over a single frequency band, the Association Request frame indicating a plurality of frequency bands requested for a multi-band setup; and

a receiver which, in operation, receives from the AP multi-band apparatus an Association Response frame over the single frequency band, the Association Response frame indicating frequency band(s) that are successfully accepted and frequency band(s) that are not.

2. The non-AP multi-band apparatus of claim 1, wherein the multi-band setup can be performed on any of the plurality of frequency bands.

3. The non-AP multi-band apparatus of claim 1, wherein the Association Request frame includes a common information field and a plurality of band specific fields.

4. The non-AP multi-band apparatus of claim 1, wherein a single association record is maintained by the AP multi-band apparatus for the plurality of frequency bands.

5. The non-AP multi-band apparatus of claim 4, wherein the single association record includes at least one of an association state variable, an Association ID (AID), and security keys for each of the plurality of frequency bands.

6. The non-AP multi-band apparatus of claim 1, wherein a unified MAC address is used to identify the non-AP multi-band apparatus.

7. The non-AP multi-band apparatus of claim 1, wherein a single Association ID (AID) is allocated to the non-AP multi-band apparatus.

8. The non-AP multi-band apparatus of claim 1, wherein a single MAC Service Access Point (SAP) is used to manage a plurality of band-specific MAC layers and a plurality of band-specific PHY layers.

9. The non-AP multi-band apparatus of claim 1, wherein after the multi-band setup is established, the receiver simultaneously receives a plurality of signals over the successfully accepted frequency band(s).

10. A communication method for a non-Access Point (non-AP) multi-band apparatus, the communication method comprising:

transmitting an Association Request frame to an Access Point (AP) multi-band apparatus over a single frequency band, the Association Request frame indicating a plurality of frequency bands requested for a multi-band setup; and

receiving from the AP multi-band apparatus an Association Response frame over the single frequency band, the Association Response frame indicating frequency band(s) that are successfully accepted and frequency band(s) that are not.

11. The communication method of claim 10, wherein the multi-band setup can be performed on any of the plurality of frequency bands.

12. The communication method of claim 10, wherein the Association Request frame includes a common information field and a plurality of band specific fields.

13. The communication method of claim 10, wherein a single association record is maintained by the AP multi-band apparatus for the plurality of frequency bands.

14. The communication method of claim 13, wherein the single association record includes at least one of an association state variable, an Association ID (AID), and security keys for each of the plurality of frequency bands.

15. The communication method of claim 10, wherein a unified MAC address is used to identify the non-AP multi-band apparatus.

16. The communication method of claim 10, wherein a single Association ID (AID) is allocated to the non-AP multi-band apparatus.

17. The communication method of claim 10, wherein a single MAC Service Access Point (SAP) is used to manage a plurality of band-specific MAC layers and a plurality of band-specific PHY layers.

18. The communication method of claim 10, comprising:

simultaneously receiving a plurality of signals over the successfully accepted frequency band(s) after the multi-band setup is established.