

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2017/0223731 (“Lee 731”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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WO 2016/021858 (“Lee 858”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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Evgeny Khorov et al., <i>IEEE 802.11ax: How to Build High Efficiency WLANs</i> , 2015 Int'l Conf. on Eng'g & Telecomm. 14-19 (2015) ("Khorov")	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 ("Lee 731") • WO 2016/021858 ("Lee 858") • IEEE P802.11 802.11-16/0024r1 "Proposed TGax draft specification" ("Stacey 0024") • IEEE 802.11-16/0042r2 "BSS Color Settings for a Multiple BSSID Set" ("Ko 0042") • US 2016/0249397 ("Seok 397") • US 10,666,368 ("Barriac 368") • US 10,321,485 ("Noh 485") • US 2016/0345258 ("Zhou 258") • US 2021/0243787 ("Oteri 787") • US 2017/0127352 ("Park 352") • US 2017/0188306 ("Park 306") • US 2015/0124744 ("Zhu 744") • WO 2017/031640 ("Du 640") • US 2017/0078887 ("Barriac 887") • IEEE 802.11-16/0396r0 "Issues on BSS Color Collision" ("Ko 0396") • US 2016/0330663 ("Zhou 663") • EP 2986066A ("Nelson 066") • US 2019/082387 ("Kim 387") • US 2016/330685 ("Asterjadhi 685") • US 2017/257817 ("Itagaki 817") • IEEE Std 802.11-2012 ("802.11-2012") • IEEE Std 802.11ac ("802.11ac") • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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US 2016/0249397 (“Seok 397”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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US 10,666,368 (“Barriac 368”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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US 10,321,485 (“Noh 485”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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US 2016/0345258 (“Zhou 258”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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US 2021/0243787 (“Oteri 787”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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US 2017/0127352 (“Park 352”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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WO 2017/031640 (“Du 640”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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US 2017/0188306 (“Park 306”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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US 2017/0078887 (“Barriac 887”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

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US 2016/0330663 (“Zhou 663”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
EP 2986066A (“Nelson 066”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2019/082387 (“Kim 387”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2016/330685 (“Asterjadhi 685”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2017/257817 (“Itagaki 817”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
IEEE Std 802.11-2012 (“802.11-2012”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
IEEE Std 802.11ac (“802.11ac”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
IEEE Std 802.11ax/D1.0	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
Systems implementing IEEE 802.11ac	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Knowledge of a person of ordinary skill

As mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art. Moreover, the exemplary combinations are provided based on Defendants’ current understanding of the Asserted Claims and Plaintiff’s apparent view of the

scope of those claims as shown, for example, in Plaintiff's Infringement Contentions. Further, a *Markman* Order has not yet been issued in this case. As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

8. U.S. Patent No. 11,700,597

Pursuant to P.R. 3-3(a) and (b), Defendants identify in Appendix H the prior art references that render obvious the Asserted Claims of the '597 patent and include below exemplary combinations showing the obviousness of the '597 patent Asserted Claims in view of the prior art. To the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix H, the limitation would have been obvious in light of the disclosures within the reference and the knowledge of one of skill in the art at the time of the '597 patent. Moreover, to the extent Plaintiff contends that an element is not disclosed in any one of the anticipatory references described in Appendix H, such reference may be combined with any other references listed in Appendix H for such element, thereby rendering the claims invalid for obviousness.

To the extent a finder of fact determines that a limitation of any of the '597 patent Asserted Claims is not disclosed by one of the references identified above pursuant to P.R. 3-3(a), the claim is nevertheless unpatentable as obvious because they contain nothing that constitutes a patentable innovation. To the extent a finder of fact determines that a limitation of the '597 patent Asserted Claims is not anticipated, it does not go beyond combining familiar elements according to known methods to achieve predictable results or does more than choose between clear alternatives known to those of ordinary skill in the art.

a) Obviousness Rationale

For at least the reasons described in these contentions, it would have been obvious to one of ordinary skill in the art to combine any of a number of prior art references, including any combination of those prior art references identified in Appendix H along with the knowledge of one of ordinary skill in the art to meet the limitations of the '597 patent Asserted Claims. Moreover, as mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art. As such, Defendants' inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

To the extent not anticipated, the '597 patent Asserted Claims represent no more than the result of ordinary variations of the prior art. Defendants further believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, as each combination of art would have no unexpected results, and at most would simply represent a known alternative to one of skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415-16 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, instead espousing an "expansive and flexible" approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.* at 420-21. Nevertheless, in addition to the information contained elsewhere in these contentions, Defendants identify motivation and reason to combine the cited art.

One or more combinations of the prior art references identified in Appendix H would have been obvious because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known,

equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Further, the combinations of the prior art references identified in Appendix H would have been obvious because the combinations represent known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; common authorship; the effects of demands known to the design community or present in the marketplace; the existence of a known problem for which there was an obvious solution encompassed by the '597 patent Asserted Claims; the existence of a known need or problem in the field of the endeavor at the time of the alleged invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

Thus, the motivation to combine the teachings of the prior art references disclosed in Appendix H is found in the references themselves and also in: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified

predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Additionally, it would be obvious to one of skill in the art to consult and/or combine any of the prior art listed in Appendix H because all of these references relate to the same area of technology and/or are from analogous art. The '597 patent Asserted Claims are directed to disallowing processes that are based on BSS color. *See, e.g.*, '597 patent at 4:34-38, 21:28-32, 21:40-44, 51:22-27; 51:37-42, cl. 1, cl. 9. The prior art references generally relate to 802.11 WLAN technology. The references, like the '597 patent, are also reasonably pertinent to wireless communications issues in the PHY and MAC layers or issues related to overlapping basic service sets or BSS color. A person of ordinary skill would have understood that these related or analogous references can generally be combined to yield predictable results. Additionally, a person of ordinary skill would have found it obvious to leverage solutions to one WLAN technical problem in order to solve a different, but analogous, WLAN technical problem. Moreover, the technical complexity of WLAN technology would have motivated a person of ordinary skill to search for and consult references from within the field before considering references from outside the technical field. A person of ordinary skill would have motivated to combine these related or analogous art to provide benefits of each reference.

Similarly, it would be obvious to one of skill in the art to consult and/or combine any of the prior art listed in Appendix H because all of these references are works by people in the same technical field. For example, many of the authors of the prior art references are members of the same IEEE 802.11ax High Efficiency (HE) working group. *See e.g.*, IEEE 802.11-16/0024r1 (“Stacey 0024”) (identifying authors of prior art references, such as Stacey, Cariou, Merline,

Jeongki Kim, Wentink). Moreover, one of ordinary skill in the art would have recognized that members of an IEEE working group frequently collaborate with, and build on, each other's work. Thus, one of ordinary skill in the art would have recognized that the works of the same IEEE working group are likely compatible or otherwise work harmoniously when combined.

The '597 patent Asserted Claims merely unite old elements, well known in the field, with no change in their respective function or result. Given the interrelated teachings of the prior art, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art, it would have been obvious for one of ordinary skill in the art to combine these familiar elements, disclosed and/or embodied in the prior art listed above to practice the '597 patent Asserted Claims.

All of the '597 patent Asserted Claims are directed to disallowing processes that are based on BSS color. Such technology, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, was widely known before the alleged priority date of the '597 Patent, as evidenced by the references in Appendix H. *See, e.g.*, Lee 731 at Abstract, [0007]-[0010], [0012]-[0014], [0016], [0017], [0045]-[0047], [0051], [0055], [0058]-[0061], [0064], [0064], [0065], [0067]-[0069], [0071]-[0080], [0082]-[0086], [0088]-[0090], Figure 2, Figure 3, Figure 5, Figure 7, Figure 8; Lee 858 at [7]-[10], [12]-[14], [16], [17], [45]-[47], [51], [56], [61]-[64], [67], [68], [71]-[73], [75]-[79], [81]-[85], [88]-[92], [94]-[96], Figure 2, Figure 3, Figure 5, Figure 6, Figure 8; Stacey 0024 at 28, 29, 35, 24, 46, 48-49; Ko 0042 at 2-8; Khorov at 2-5; Seok 397 at Abstract, [0012]-[0014], [0023], [0073], [0078], [0079], [0089], [0090], [0101], [0157], [0188], [0189], [0195], [0240], [0241], [0283]- [0285], [0296], [0311], Figure1, Figure 4, Figure 5, Figure 7, Figure 8, Figure 12, Figure 15; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9,

6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Noh 485 at 2:2-8, 10:1-13, 12:18-24, 12:44-13:47, 15:14-18, 15:39-53, 15:60-65, 16:18-26, 16:33-40, 16:58-64, 17:44-52, 17:62-65, 19:2-10, 20:22-51, 23:40-45; Zhou 258 at [0005], [0006], [0017], [0044]-[0046], [0049]-[0051], [0054], [0056], [0065], [0069], [0070], [0072], [0075], [0083]-[0087], [0091], [0097], [0100], [0105]-[0107], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at Abstract, [0003], [0040], [0051], [0071], [0072], [0078], [0106], [0108]-[0112]; Park 352 at [0044], [0075], [0076], [0103], [0104], [0107], [0119]- [0121], [0134], [0159], [0161], [0173].

One of ordinary skill in the art would have been motivated to combine any of the references in Appendix H because, at the time of the alleged invention, BSS color collisions were a common problem with a well-known solution. In particular, common problems (*i.e.*, BSS color collisions) with conventional techniques for OBSS wireless communication were known to persons of ordinary skill in the art. *See, e.g.*, Khorov at 5 (“In .11ax, the size is increased at least up to 6 bits to reduce error probability [36], since BSS colors of two neighboring BSS can collide.”); Zhou 258 at Abstract (“For example, the BSSs may use the same value for X-bit color indicators which results in a color collision if the BSSs are neighbor BSSs.”); Ko 0396 at 2 (“Due to the lack of BSS color values, there may be the case that neighboring BSSs use the same BSS color value . . . This case is referred as ‘BSS color collision’ hereinafter.”); Kim 387 at [0006] (“However, since the number of bits for representing BSS color information used by the STA to distinguish whether the received frame is intended for the STA is limited, it may cause not only a BSS color collision with a neighboring BSS but also malfunction of the STA.”); Itagaki 817 at [0073] (“[T]he COLOR field includes 3 bits, and there are only 8 possible choices . . . Therefore, BSS COLOR overlapping between BSSes (OBSSes) having overlapping communication ranges”). BSS color collision is a

subset of contention-related issues that commonly arise in wireless communications (including, but not limited to, Wi-Fi) and of which a POSITA would have been aware at the time of the alleged invention. *See, e.g.*, Nelson 066 at [0003] (“[A] collision can occur on the radio channel when two or more transmitter devices transmit on the radio channel simultaneously.”). A POSITA would have understood that in the event of a BSS color collision, use of BSS color may be an ineffective means for classifying PPDU as either inter-BSS or intra-BSS. A POSITA would have been aware that in the event of identifier contention/collision generally, an obvious solution is to disable or disallow use of the identifier. In particular, disabling and/or disallowing BSS color use was well-known at the time of the alleged invention. *See, e.g.*, Lee 731 at Abstract (disclosing a “coloring disable bit”); Barriac 887 at [0098] (“APs can selectively allow or disallow reuse of the wireless medium based on a ‘BSS distance.’”). Thus, a POSITA would have found it obvious to disable/disallow BSS color use in the event of a BSS color collision. Doing so would have amounted to (1) combining prior art elements (*i.e.*, BSS color collision and disabling/disallowing BSS color use) according to known methods to yield predictable results, (2) applying a known technique (*i.e.*, disabling or disallowing use of BSS color) to a known device ready for improvement (*i.e.*, a Wi-Fi device experiencing a BSS color collision) to yield predictable results. It would also have been obvious to a POSITA to try disabling BSS color use in the event of a BSS color collision, as use of other identifiers (e.g., MAC address) to classify PPDU was well-known at the time.

Before the time of the '597 patent, wireless communication terminals were well known to one of skill in the art. *See, e.g.*, Lee 731 at Abstract, [0005], [0007], [0008], [0010]-[0014], [0032]-[0036], [0039]- [0041], [0062]-[0065], [0067]-[0073], [0076]-[0080], [0082]-[0086], [0088]-[0090], [0092]-[0097], Figure 1, Figure 2, Figure 7, Figure 8; Lee 858 at Abstract, [5], [7], [8],

[10]-[14], [32]-[36], [39]-[41], [65]-[68], [71]-[77], [81]-[85], [88]-[92], [94]-[96], [98]-[103], Figure 1, Figure 2, Figure 7, Figure 8; Stacey 0024 at 6-7, 11-12, 15-17, 22, 40-42, 45-52; Ko 0042 at 2-8, 10; Khorov at 1-5; Seok 397 at Abstract, [0005], [0007], [0008], [0012], [0019], [0045]-[0047], [0075], [0076], [0080], [0125], [0400]- [0402], cl. 1, Figure 1, Figure 5; Barriac 368 at 1:54-61, 10:17-23, 10:31-42, 10:64-11:15, 11:16-23, 11:53-60, 11:61-12:9, 12:32-42, 12:43-55, 12:56-62, 13:13-27, 27:4-18; Noh 485 at 4:34-50, 5:58-60, 6:31-40, 10:20-33, 11:14-23, 26:37-46; Zhou 258 at [0003], [0004], [0033], [0033], [0086], [0091], Figure 9, Figure 10, Figure 11A, Figure 11B, Figure 12A, Figure 12B; Oteri 787 at Abstract, [0002], [0027], [0028], [0036], [0047], [0048], [0050], [0051], [0053]-[0055], [0060], [0061], [0128], Figure 1A, Figure 1B; Park 352 at [0004], [0010], [0011], [0030], [0037], [0038], Claim 1, Claim 6, Figure , Figure 15.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that wireless communication terminals may include a transceiver. *See, e.g.*, Lee 731 at Abstract, [0002], [0007]-[0011], [0013], [0014], [0032], [0033], [0035], [0036], [0065], [0067]-[0069], [0073], [0076]-[0080], [0082]-[0086], [0088]- [0090], [0092], [0093], Figure 1, Figure 2, Figure 7, Figure 8; Lee 858 at Abstract, [2]-[11], [13], [14], [32], [33], [35], [36], [68], [71]-[73], [77], [81]-[85], [88]-[92], [94]-[96], [98], [99], Figure 1, Figure 2, Figure 7, Figure 8; Stacey 0024 at 38, 39, 55-60, 93, 124; Ko 0042 at 2-5, 7; Khorov at 1-5; Seok 397 at [0006], [0013], [0047], [0051], [0052], [0073], [0078], [0080], [0082], [0101], [0157], [0178], [0237], [0301], [0313], [0314], Figure 1, Figure 4, Figure 5, Figure 7, Figure 8; Barriac 368 at 3:24-34; 3:38-52, 6:61-7:3, 7:33-41, 10:57-63, 12:32-42, 12:43-55, 23:42-49, 24:60-67, 25:10-17, 25:24-31; Noh 485 at 5:58-60, 6:1-6, 6:7-10, 6:44-54, 7:7-12, 7:24-29, 7:60-8:3, 8:10-17, 8:60-9:3, 9:4-20, 11:30-41, 11:42-56, 11:57-63, 12:49-55, 15:19-53, 15:54-16:40, 18:6-24; Zhou 258 at [0070], [0086], [0090],

[0091], [0092], [0100], [0107], Figure 9, Figure 10, Figure 11A, Figure 11B, Figure 12A, Figure 12B; Oteri 787 at [0028], [0029], [0037]-[0039], [0042], [0046], [0053], [0128], Figure 1A, Figure 1B; Park 352 at Abstract, [0005]-[0007], [0010], [0011], [0038], Figure 1, Figure 15.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that wireless communication terminals may include a processor. *See, e.g.*, Lee 731 at [0008], [0092], [0093], [0095]-[0097], Figure 2, Figure; Lee 858 at [8], [98], [99], [101], [102], [103], Figure 2, Figure 8; Stacey 0024 at 26, 40, 102, 108, 117, 120-121; Ko 0042 at 2-5, 7; Khorov at 1-5; Seok 397 at Abstract, [0006], [0013], [0020], [0021], [0047]-[0051], [0055], [0056], [0058], [0060], [0062], [0064]-[0066], [0069], [0071], [0072], [0284], Figure 1- Figure 3; Barriac 368 at 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 6:61-7:3, 7:7-20, 7:21-32 [0034], 7:33-41, 11:61-12:9, 12:10-20, 12:21-31, 12:43-55, 13:4-13, 23:33-41, 23:50-55, 24:60-67, 25:1-9, 25:18-23, 26:13-28; Noh 485 at 5:58-60, 6:55-60, 6:61-7:6, 7:7-12, 6:44-54, 26:20-30, 26:37-46; Zhou 258 at [0009], [0086], [0091], [0099], [0100], [0101], [0104], [0105], [0107], [0108], [0109], [0134], [0135], [0136], Figure 9, Figure 10, Figure 11A, Figure 11B, Figure 12A, Figure 12B; Oteri 787 at [0038], [0039], [0043]-[0046], [0053]-[0055], [0059], [0128], Figure 1A, Figure 1B; Park 352 at [0011], [0187]-[0198], Figure 1, Figure 15.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that a processor may be configured to receive a physical layer convergence procedure ("PLCP") processing data unit ("PPDU"). *See, e.g.*, Lee 731 at Abstract, [0007]-[0010], [0012]-[0014], [0016], [0017], [0045]-[0047], [0051], [0055], [0058]-[0061], [0064], [0064], [0065], [0067]-[0069], [0071]-[0080], [0082]-[0086], [0088]-[0090], Figure 2, Figure 3, Figure 5, Figure

7, Figure 8; Lee 858 at [7]-[10], [12]-[14], [16], [17], [45]-[47], [51], [56], [61]-[64], [67], [68], [71]-[73], [75]-[79], [81]-[85], [88]-[92], [94]-[96], Figure 2, Figure 3, Figure 5, Figure 6, Figure 8; Stacey 0024 at 28, 29, 35, 24, 46, 48-49; Ko 0042 at 2-8; Khorov at 2-5; Seok 397 at Abstract, [0012]-[0014], [0023], [0073], [0078], [0079], [0089], [0090], [0101], [0157], [0188], [0189], [0195], [0240], [0241], [0283]- [0285], [0296], [0311], Figure1, Figure 4, Figure 5, Figure 7, Figure 8, Figure 12, Figure 15; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Noh 485 at 2:2-8, 10:1-13, 12:18-24, 12:44-13:47, 15:14-18, 15:39-53, 15:60-65, 16:18-26, 16:33-40, 16:58-64, 17:44-52, 17:62-65, 19:2-10, 20:22-51, 23:40-45; Zhou 258 at [0005], [0006], [0017], [0044]-[0046], [0049]-[0051], [0054], [0056], [0065], [0069], [0070], [0072], [0075], [0083]-[0087], [0091], [0097], [0100], [0105]-[0107], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at Abstract, [0003], [0040], [0051], [0071], [0072], [0078], [0106], [0108]-[0112]; Park 352 at [0044], [0075], [0076], [0103], [0104], [0107], [0119]- [0121], [0134], [0159], [0161], [0173].

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that a processor may be configured not to use a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed. *See, e.g.*, Lee 731 at Abstract, [0007]-[0010], [0012]-[0014], [0016], [0017], [0045]-[0047], [0051], [0055], [0058]-[0061], [0064], [0064], [0065], [0067]-[0069], [0071]-[0080], [0082]-[0086], [0088]-[0090], Figure 2, Figure 3, Figure 5, Figure 7, Figure 8; Lee 858 at [7]-[10], [12]-[14], [16], [17], [45]-[47], [51], [56], [61]-[64], [67], [68], [71]-[73], [75]-[79], [81]-[85], [88]-[92], [94]-[96],

Figure 2, Figure 3, Figure 5, Figure 6, Figure 8; Stacey 0024 at 28, 29, 35, 24, 46, 48-49; Ko 0042 at 2-8; Khorov at 2-5; Seok 397 at Abstract, [0012]-[0014], [0023], [0073], [0078], [0079], [0089], [0090], [0101], [0157], [0188], [0189], [0195], [0240], [0241], [0283]- [0285], [0296], [0311], Figure1, Figure 4, Figure 5, Figure 7, Figure 8, Figure 12, Figure 15; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Noh 485 at 2:2-8, 10:1-13, 12:18-24, 12:44-13:47, 15:14-18, 15:39-53, 15:60-65, 16:18-26, 16:33-40, 16:58-64, 17:44-52, 17:62-65, 19:2-10, 20:22-51, 23:40-45; Zhou 258 at [0005], [0006], [0017], [0044]-[0046], [0049]-[0051], [0054], [0056], [0065], [0069], [0070], [0072], [0075], [0083]-[0087], [0091], [0097], [0100], [0105]-[0107], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at Abstract, [0003], [0040], [0051], [0071], [0072], [0078], [0106], [0108]-[0112]; Park 352 at [0044], [0075], [0076], [0103], [0104], [0107], [0119]- [0121], [0134], [0159], [0161], [0173]. For reasons described above, it would have been obvious to incorporate disabling or disallowing BSS color use (*e.g.*, in the event of a detected BSS color collision).

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that BSS color is an identifier of a BSS. *See, e.g.*, Lee 731 at Abstract, [0007]-[0014], [0017], [0034], [0037], [0038], [0040], [0041], [0062]-[0064], [0067]- [0068], [0071]- [0075], [0082], [0083], [0085], [0089], Figure 1, Figure 2, Figure 8; Lee 858 at Abstract, [7]-[14], [17], [34], [37]-[38], [40], [41], [65]-[67], [71]-[72], [75]-[70], [88], [89], [91], [95], Figure 1, Figure 2, Figure 8; Stacey 0024 at 24, 46, 49; Ko 0042 at 2-8; Khorov at 2, 4-5; Seok 397 at Abstract, [0012]-[0014], [0283]- [0285], [0296], [0311], [0354]; Barriac 368 at 2:60-69, 3:11-23, 4:8-16, 5:1-10,

6:1-10, 13:45-61, 20:53-62, 20:63-21:5, 21:6-23, 23:17-24; Noh 485 at 15:39-53, 15:60-65, 16:18-26, 17:44-52, 17:62-65, 19:2-10, 20:22-51, 23:40-45; Zhou 258 at [0003], [0004], [0005], [0006], [0044], [0049], [0067]; Oteri 787 at Abstract, [0003], [0071], [0072], [0078], [0106], [0108]-[0112]; Park 352 at [0044], [0103], [0104], [0107], [0119], [0120], [0159], [0161], [0173].

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that signaling information can be transmitted from a base wireless communication terminal to which a receiving wireless communication terminal is associated. *See, e.g.*, Lee 731 at [0034]-[0036], [0040], [0041], [0062], [0063], [0065], [0067], [0069], Figure 1, Figure 2, Figure 7, Figure 8; Lee 858 at [34], [35], [36], [40], [41], [65], [66], [68], [71], [73], Figure 1, Figure 2, Figure 7, Figure 8; Stacey 0024 at 24, 46, 48-49, 54-55, 78-80, 80-85, 85-91; Ko 0042 at 2-5, 7; Khorov at 1-5; Seok 397 at [0187], [0189], [0230], [0232], [0240], [0241], [0243], [0283]- [0285], [0343], [0345], [0346], [0369], Figure 22; Barriac 368 at 13:13-27, 16:14-43, 20:29-38, 20:39-50, 21:6-23 21:48-58; Noh 485 at 12:44-49, 14:59-65, 16:4-8, 16:9-17, 16:27-32, 16:53-57, 17:34-36, 22:9-21, 22:31-43, 23:1-4, 23:9-21, 25:29-31; Zhou 258 at [0004], [0006], [0016], [0049], [0051], [0066], [0070], [0078], [0085], [0087], [0088], [0093], [0118]; Oteri 787 at [0040], [0051], [0054], [0081], [0082], [0086], [0088], [0117]; Park 352 at [0039], [0061], [0065], [0066], [0075], [0078], [0103], [0181].

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that a processor can be configured not to set an Intra-BSS Network Allocation Vector (NAV) by using the BSS color indicated by a signaling field of the PPDU when the signaling information indicates that the operation based on the BSS color is not allowed. *See, e.g.*, Lee 731

at [0052]-[0055], [0057], [0070]-[0073], [0076]-[0080], [0082], [0084], [0086], [0088], Figure 5; Lee 858 at [53]-[57], [74]-[77], [81]-[85], [88], [90], [92], [94], Figure 5; Stacey 0024 at 26-27, 32, 37-38, 42-43, 46-47, 49; Ko 0042 at 2; Khorov at 1-5; Seok 397 at [0081], [0083], [0085]; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Noh 485 at 1:18-22, 1:57-2:8, 2:34-38, 11:24-29, 11:42-56, 13:55-14:9, 14:23-32, 15:54-59, 15:66-16:8, 16:18-26; Zhou 258 at [0005], [0006], [0017], [0044]-[0046], [0049], [0050], [0051], [0054], [0056], [0065], [0069], [0072], [0075], [0083], [0086], [0091], [0100], [0105], [0106], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at [0052], [0061], [0071], [0078], [0106], [0112]; Park 352 at [0137]-[0139], [0178]-[0180]. Moreover, a POSITA would have understood that setting an inter- or intra-BSS NAV requires classifying a PPDU as either inter or intra-BSS. *See, e.g.*, Stacey 0024 at 39-40. Thus, it would have been obvious to a POSITA that when BSS color cannot, or should not, be used (*e.g.*, in the event of a BSS color collision), then BSS color cannot, or should not, be used for setting an inter- or intra-BSS NAV. This amounts to combining prior art elements according to known methods to yield predictable results. Moreover, the references disclosing both the BSS color collision scenario and inter-/intra-BSS NAV would have provided a POSITA with a teaching, suggestion, or motivation to combine one with the other.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that an Intra-BSS NAV is different from a Basic NAV and is a NAV which is set based on an Intra-BSS PPDU. *See, e.g.*, Lee 731 at [0052]-[0055], [0057], [0063], [0064], [0082],

[0084], [0086], [0088], [0090], Figure 5; Lee 858 at [53]-[57], [66], [67], [88], [89], [92], [94], [96], Figure 5; Stacey 0024 at 26-27, 32, 37-38, 42-43, 46-47, 49; Ko 0042 at 2, 4, 7-8, 10; Khorov at 1-5; Seok 397 at [0081], [0083], [0085]; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Noh 485 at 1:57-2:8, 2:34-38, 13:55-14:9, 15:54-59, 15:66-16:8, 16:18-26; Zhou 258 at [0005], [0006], [0017], [0044]-[0046], [0049]-[0051], [0054], [0056], [0065], [0069], [0072], [0075], [0083], [0086], [0091], [0100], [0105], [0106], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at [0052], [0061], [0071], [0078], [0106], [0112]; Park '352 at [0098], [0102], [0104], [0118], [0122], [0137]-[0139], [0178]-[0180].

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that a Basic NAV is set based on an Inter-BSS PPDU or a PPDU which is not able to be identified as the Inter-BSS PPDU or the Intra-BSS PPDU. *See, e.g.*, Lee 731 at [0052], [0053], [0054]-[0056], [0063]-[0064], [0082], [0084], [0086], [0088], [0090], Figure 5; Lee 858 at [0053]-[0057], [66], [67], [88], [90], [92], [94], [96], Figure 5; Stacey 0024 at 26-27, 32, 37-38, 42-43, 46-47, 49; Ko 0042 at 3, 4, 7; Khorov at 1-5; Seok 397 at [0081], [0083], [0085]; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Noh 485 at 1:57-2:8, 2:34-38, 13:55-14:9, 15:54-59, 15:66-16:8, 16:33-40, 17:5-10; Zhou 258 at [0005], [0006], [0017], [0044]-[0046], [0049]-[0051], [0054], [0056], [0065], [0069], [0072],

[0075], [0083], [0086], [0091], [0100], [0105], [0106], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at [0052], [0061], [0071], [0078], [0106], [0112]; Park '352 at [0098], [0102], [0104], [0118], [0122], [0137]-[0139], [0178]-[0180].

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that a PPDU can include a TXOP Duration field in the signaling field of the PPDU and a medium access control (MAC) frame which includes a duration field. *See, e.g.*, Lee 731 at [0035], [0052], [0053], [0054]-[0056], [0065], [0070]-[0073], [0076]-[0080], [0082], [0084], [0086], [0088], [0090], Figure 5, Figure 7; Lee 858") at [35], [53], [54], [55]-[57], [68], [74]-[77], [81]-[85], [88], [90], [92], [94], [96], Figure 5, Figure 7; Stacey 0024 at 37-38, 80, 81, 82; Ko 0042 at 2, 4, 5, 7, 10; Khorov at 1-5; Seok 397 at [0081], [0083], [0085], [0095], [0105]- [0107], [0253], [0259], [0261], [0262]; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Noh 485 at 2:57-59, 16:18-26, 21:28-32, 21:42-53, 18:43-48; Zhou 258 at [0005], [0006], [0017], [0044], [0045], [0046], [0049], [0050], [0051], [0054], [0056], [0065], [0069], [0072], [0075], [0083], [0086], [0091], [0100], [0105], [0106], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at [0080], [0083], [0090], [0096], [0120], [0121]; Park '352 at [0060], [0138], [0139], [0143], [0145], [0152]- [0153], [0155], [0196], Claim 2, Claim 7.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that the TXOP Duration field indicates information used for setting the Intra-BSS

NAV and the Basic NAV. *See, e.g.*, Lee 731 at [0052]-[0056], [0063], Figure 5; Lee 858 at [53]-[57], [66], [67], Figure 5; Stacey 0024 at 37-38, 80, 81, 82; Ko 0042 at 2, 4, 5, 7, 10; Khorov at 1-5; Seok 397”) at [0081], [0083], [0085], [0095], [0105]- [0107], [0253], [0259], [0261], [0262]; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Zhou 258”) at [0005], [0006], [0017], [0044]-[0046], [0049]-[0051], [0054], [0056], [0065], [0069], [0072], [0075], [0083], [0086], [0091], [0100], [0105], [0106], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at [0052], [0061], [0071], [0078], [0080], [0083], [0090], [0096], [0106], [0112], [0120], [0121]; Park ’352 at [0137]-[0139], [0178]-[0180], [0196], Claim 2, Claim 7.

It was well-known to one of skill in the art before the time of the ’597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff’s infringement contentions, that the duration field indicates information used for setting the Intra-BSS NAV and the Basic NAV. *See, e.g.*, Lee 731 at [0052]-[0056], [0063], [0064], Figure 5; Lee 858 at [53]-[57], [66], [67], Figure 5; Stacey 0024 at 37-38, 80, 81, 82; Ko 0042 at 2, 4, 5, 7, 10; Khorov at 1-5; Seok 397 at [0081], [0083], [0085], [0095], [0105]- [0107], [0253], [0259], [0261], [0262]; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Zhou 258 at [0005], [0006], [0017], [0044]- [0046], [0049]- [0051], [0054], [0056], [0065], [0069], [0072], [0075], [0083], [0086], [0091], [0100], [0105], [0106], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at [0052], [0061], [0071], [0078], [0080], [0083],

[0090], [0096], [0106], [0112], [0120], [0121]; Park '352 at [0060], [0137]-[0139], [0143], [0145], [0152], [0153], [0155], [0178]-[0180].

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that the processor can be configured not to use the TXOP Duration field for setting the Intra-BSS NAV or the Basic NAV when the wireless communication terminal gets a valid signaling field of the MAC frame. *See, e.g.*, Lee 731 at [0035], [0052]- [0056], [0062]-[0065], Figure 5, Figure 7; Lee 858 at [35], [53]-[57], [65]-[68], Figure 5, Figure 7; Stacey 0024 at 37-38, 80, 81, 82; Ko 0042 at 2, 4, 5, 7, 10; Khorov at 1-5; Seok 397 at [0081], [0083], [0085], [0095], [0105]- [0107], [0253], [0259], [0261], [0262]; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Zhou 258 at [0005], [0006], [0017], [0044]-[0046], [0049], [0050], [0051], [0054], [0056], [0065], [0069], [0072], [0075], [0083], [0086], [0091], [0100], [0105], [0106], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787" at [0052], [0061], [0071], [0078], [0080], [0083], [0090], [0096], [0106], [0112], [0120], [0121]; Park '352 at [0060], [0137]-[0139], [0143], [0145], [0152], [0153], [0155], [0178]-[0180].

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that the processor can be configured to signal that the operation based on the BSS color is not allowed when the wireless communication terminal recognizes that a BSS color collision has occurred. *See, e.g.*, Lee 731 at [0062]-[0064]; Lee 858 at [65]-[67]; Stacey 0024 at 32, 41, 46, 48-49; Ko 0042 at 4, 6, 8; Khorov at 1, 2, 4, 5; Seok 397 at [0023], [0073], [0078],

[0079], [0284], [0327], [0329], [0354], [0356], [0359], Figure 4, Figure 5; Barriac 368 at Abstract, 2:11-20, 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7, 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Zhou 258 at [0005], [0006], [0017], [0044]-[0046], [0049]-[0051], [0054], [0056], [0065], [0069], [0072], [0075], [0083], [0086], [0091], [0100], [0105], [0106], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at Abstract, [0003], [0040], [0051], [0057], [0071], [0072], [0078], [0106], [0108]- [0112]; Park '352 at [0046], [0081], [0083], [0103], [0104], [0107], [0111], [0116], [0117], [0119], [0127], [0132], [0134], [0140], [0173]. Moreover, a POSITA would have understood that a BSS color collision scenario is one reason to disallow/disable BSS color use. *See, e.g.*, Khorov at 5 (“In 11ax, the size is increased at least up to 6 bits to reduce error probability [36], since BSS colors of two neighboring BSS can collide.”); Zhou 258 at Abstract (“For example, the BSSs may use the same value for X-bit color indicators which results in a color collision if the BSSs are neighbor BSSs.”); Ko 0396 at 2 (“Due to the lack of BSS color values, there may be the case that neighboring BSSs use the same BSS color value . . . This case is referred as ‘BSS color collision’ hereinafter.”); Kim 387 at [0006] (“However, since the number of bits for representing BSS color information used by the STA to distinguish whether the received frame is intended for the STA is limited, it may cause not only a BSS color collision with a neighboring BSS but also malfunction of the STA.”); Itagaki 817 at [0073] (“[T]he COLOR field includes 3 bits, and there are only 8 possible choices . . . Therefore, BSS COLOR overlapping between BSSes (OBSSes) having overlapping communication ranges”). A POSITA would further have understood that, in the event of a BSS color collision, an AP would ideally update the BSS color to rectify the color collision. *See, e.g.*, Itagaki 817 at [0192]. Thus, a POSITA would have found it obvious to

configure a device to signal when a BSS color collision is detected. *See, e.g., id.*, Zhou 258 at [0005], [0017]-[0018]. This amounts to combining prior art elements according to known methods to yield predictable results.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that a BSS color collision represents that different BSSs correspond to one BSS color. *See, e.g.,* Lee 731 at [0062]-[0064]; Lee 858 at [65]-[67]; Stacey 0024 at 32, 41, 46, 48-49; Ko 0042 at 2, 4, 5, 6, 8; Khorov at 1, 2, 4, 5; Seok 397 at [0023], [0073], [0078], [0079], [0284], [0327], [0329], [0354], [0356], [0359], Figure 4, Figure 5; Barriac 368 at Abstract 2:60-67, 3:11-23, 4:8-16, 5:1-10, 15:38-67, 21:6-23; Zhou 258 at [0005], [0006], [0017], [0044]-[0046], [0049]-[0051], [0054], [0056], [0065], [0069], [0072], [0075], [0083], [0086], [0091], [0100], [0105], [0106], [0109], [0110], [0113], [0117], [0121], [0125]; Oteri 787 at Abstract, [0003], [0040], [0051], [0057], [0071], [0072], [0078], [0106], [0108]- [0112]; Park '352 at [0046], [0081], [0083], [0103], [0104], [0107], [0111], [0116], [0117], [0119], [0127], [0132], [0134], [0140], [0173].

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that the processor can be configured to determine that BSS color collision has occurred based on address fields of a medium access control (MAC) frame. *See, e.g.,* Lee 731 at [0035], [0052], [0062]-[0065], [0082], [0090], Figure 7; Lee 858 at [35], [65]-[68], [88], [96]; Stacey 0024 at pg. 32, 41, 46, 48-49; Ko 0042 at pg. 4, 6, 7, 8; Khorov at pg. 2, 4, 5; Seok 397 at [0023], [0073], [0078], [0079], [0217], [0240], [0241], [0284], [0327], [0329], [354], [356], [359], Figure 4, Figure 5; Barriac 368 at 13:45-61; Zhou 258 at [0016], [0070], [0078], [0080], [0096],

[0103], [0119]; Oteri 787 at [0071]; Park '352 at [0037], [0043], [0075], [0120], [0139], [0143], [0153], [0159], [0166], [0174]. A POSITA would have understood that a MAC address is a unique identifier for a BSS and thus would have found it obvious to use MAC address to determine whether a BSS color collision has occurred. *See, e.g.*, Zhou 258 at [0016]. This amounts to combining prior art elements according to known methods to yield predictable results.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that an operation based on the BSS color includes entering a doze state of a power save operation based on a BSS color indicated by a signaling field of the PPDU. *See, e.g.*, Lee 731 at [0070]-[0073], [0076]- [0080], [0082], [0084], [0086], [0088], [0090]; Lee 858 at [74]-[77], [81]-[85], [88], [90], [92], [94], [96], Figure 7; Stacey 0024 at pg. 35, 36-37, 48-50; Ko 0042 at pg. 2, 5, 6, 8; Khorov at pg. 1-5; Seok 397 at [0096], [0235], [0236], [0284], cl 18, Table II; Barriac 368 at Abstract 2:11-20 , 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7 , 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Zhou 258 at [0003], [0004], [0048]- [0050], [0084]; Oteri 787 at [0072], [0078], [0106], [0107]; Park '352 at [0004], [0005], [0007], [0012], [0058]-[0062], [0064], [0071], [0083], [0107], [0110], [0113], [0114], [0123], [0124], [0131], [0135]-[0140], [0147], [0148], [0155], [0163], [0196], Figure 6, Figure 8, Figure 9, Figure 10. Moreover, a POSITA would have understood that setting entering/not entering a doze state may require classifying a PPDU as either inter or intra-BSS. *See, e.g.*, Stacey 0024 at 50-51. Thus, it would have been obvious to a POSITA that when BSS color cannot, or should not, be used (*e.g.*, in the event of a BSS color collision), then BSS color cannot, or should not, be used for deciding whether to enter a doze state. This amounts to

combining prior art elements according to known methods to yield predictable results. Moreover, the references disclosing both the BSS color collision scenario and doze state power save operations would have provided a POSITA with a teaching, suggestion, or motivation to combine one with the other.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that the power save operation is an operation for the wireless communication terminal to enter the doze state until an end of a received PPDU which is an Intra-BSS PPDU. *See, e.g.*, Lee 731 at [0070]-[0073], [0076]- [0080], [0084], [0086], [0088], [0090]; Lee 858 at [74]-[77], [82]-[84], [88], [90], [92], [94], [96]; Stacey 0024 at pg. 35, 36-37, 48-50; Ko 0042 at pg. 2, 5, 6, 8; Khorov at pg. 1-5; Seok 397 at [0096], [0235], [0236], [0284], cl 18, Table II; Barriac 368 at Abstract 2:11-20 , 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7 , 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Zhou 258 at [0003], [0004], [0048]- [0050], [0084]; Oteri 787 at [0072], [0078], [0106], [0107]; Park '352 at [0004], [0005], [0007], [0012], [0058]-[0062], [0064], [0068], [0071], [0083], [0107], [0110], [0113], [0114], [0123], [0124], [0131], [0135]-[0140], [0147], [0148], [0155], [0163], [0196], Figure 6, Figure 8, Figure 9, Figure 10.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that a processor can be configured not to perform a spatial reuse operation when the BSS color indicated by the signaling field of the PPDU is a predetermined value. *See, e.g.*, Lee 731 at [0070]-[0073], [0076]-[0080], [0082], [0084], [0086], [0088], [0090]; Lee 858 at [74]-[77],

[81]-[85], [90], [92], [94], [96]; Stacey 0024 at pg. 46-47, 48-49; Ko 0042 at pg. 2, 4, 6; Khorov at pg. 1-5; Seok 397 at [0265], [0280], [0292], [0311], [0324], [0351], [0379], [0380], [0381], [0384]-[0387], [0389]- [0393], [0395], [0396], Figure 22, Figure 23, Figure 24, Figure 25; Barriac 368 at Abstract 2:11-20 , 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7 , 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Zhou 258 at [0003]; Oteri 787 at [0071], [0078], [0107]; Park '352 at [0103], [0104], [0107], [0119], [0173]. Moreover, a POSITA would have understood that performing spatial reuse may require classifying a PPDU as either inter or intra-BSS. *See, e.g.*, Stacey 0024 at 48-50. Thus, it would have been obvious to a POSITA that when BSS color cannot, or should not, be used (*e.g.*, in the event of a BSS color collision), then BSS color cannot, or should not, be used for spatial reuse. This amounts to combining prior art elements according to known methods to yield predictable results. Moreover, the references disclosing both the BSS color collision scenario and spatial reuse operations would have provided a POSITA with a teaching, suggestion, or motivation to combine one with the other. Moreover, a POSITA would have found it obvious that a predetermined BSS color value could signal when certain operations (including spatial reuse operations) based on BSS color are disallowed. *See, e.g.*, Stacey 0024 at 26.

It was well-known to one of skill in the art before the time of the '597 patent, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, that predetermined value of BSS color indicated by the signaling field can be 0. *See, e.g.*, Lee 731 at [0070]-[0073], [0076]-[0080], [0082], [0084], [0086], [0088], [0090]; Stacey 0024 at pg. 46-47, 48-49; Ko 0042 at pg. 2, 4, 6; Khorov at pg. 1-5; Seok 397 at [0265], [0280], [0292], [0311], [0324], [0351], [0379], [0380], [0381], [0384]-[0387], [0389]- [0393], [0395], [0396];

Barriac 368 at Abstract 2:11-20 , 2:51-59, 2:60-67, 3:11-23, 3:24-34, 3:38-52, 3:65-4:7 , 4:8-16, 4:59-67, 5:1-10, 5:57-67, 6:1-9, 6:35-49, 6:57-60, 6:61-7:3, 7:7-20, 7:21-32, 7:33-41, 7:42-47, 8:7-18, 8:28-33, 8:65-9:9, 9:20-25, 11:61-12:9, 12:43-55, 13:13-27, 13:28-61, 15:8-37, 17:4-18, 17:19-27, 19:40-47; Zhou 258 at [0003]; Oteri 787 at [0071], [0078], [0107]; Park '352 at [0103], [0104], [0107], [0119], [0173]. Moreover, a POSITA would have found it obvious that a predetermined BSS color value of 0 could signal when certain operations (including spatial reuse operations) based on BSS color are disallowed. *See, e.g.*, Stacey 0024 at 26.

In addition, the prior art also provided sets of finite, identified, predictable solutions for known problems that would have been obvious to those of ordinary skill to try with a reasonable expectation of success. For example, it would have been obvious to one of skill in the art at the time that the disclosures relating to disabling/disallowing operations based on BSS color (*e.g.*, spatial reuse and NAV setting) could be applied to mitigate the effects of a BSS color collision.

The prior art references provide motivations to combine because they describe the field of the Asserted Patents, teach improvements, explain desired features, and even expressly state that one of skill in the art would be able to apply their teachings to related systems or methods. *See, e.g.*, Lee 731 at [0098] (“[T]hose skilled in the art will appreciate that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention described in the appended claims”); Lee 858 at [104] (“[A] person skilled in the art will understand that the skilled person in the art can modify and change the present invention in various ways within the scope of the ideas and scope of the present invention described in the scope of the patent claims as described below”); Seok 397 at [0044] (“As those skilled in the art would realize, the described embodiments may be modified in various different ways, without departing from the spirit or scope of the invention”).

Further, the prior art references provide motivations to combine because they explicitly suggest utilizing the teachings and disclosures of other references.

In accordance with these advances, the prior art could have been combined according to methods known to those of ordinary skill within the field of the '597 patent to yield predictable results. For example, it was known that an increase in density of Wi-Fi networks could cause a BSS color collision scenario or similar contention issues. *See, e.g.*, Zhou 258 at [0005] (“Systems, methods, and apparatuses for detection and resolution of basic service set (BSS) reduced version identifier collisions are described”); Ko 0042 at 6 (“Due to the lack of BSS color values, the probability of BSS color collision increases in dense environment”); *see also* Ex. G1-G24 at cl. 4, 5. It was further known that (1) use of BSS color could be disabled/disallowed and (2) certain processes/operations based on BSS color could be disallowed. *See, e.g.*, Lee 731 at Abstract (“[T]he frame includes a coloring disable bit, and when the coloring disable bit indicates that the frame is a multiuser transmission-related trigger frame, the STA does not perform a change of the CCA level without regard to information indicated by the coloring bit.”); Barriac 368 at 2:12-15 (“The method includes determining, at an access point, whether to allow reuse of the wireless medium by one or more stations in a basic service set (BSS)”); *see also* Ex. G1-G24 at cl. [1c]. Those of ordinary skill in the art could have employed known techniques to improve similar prior art devices in the same way as claimed in the '597 patent.

In addition, one of ordinary skill in the art would be motivated to combine the prior art references because the elements found in the Asserted Claims of the '597 patent are well known in the art. Indeed, the listed inventors of the Asserted Patents admitted as much in the specification of the '597 Patent. *See, e.g.*, '597 patent at 1:36-2:68.

Moreover, it would have been obvious to one of ordinary skill in the art at the time to

combine the teachings of a document submitted as part of the IEEE 802.11ax standard development process (*e.g.*, working group documents, draft specifications, technical submissions, working group meeting presentations) with a system implementing an older IEEE 802.11ac standard. For example, one of ordinary skill in the art would have been motivated to combine the teachings of a document submitted as part of the IEEE 802.11ax standard development process with a real wireless communications hardware/device to yield a working wireless communication system with the improvements and benefits offered by the new standard. In another example, one of ordinary skill in the art would have been motivated to simply substitute an older version of a wireless module implemented on a wireless device/hardware with one implementing a newer version of the standard that addresses the shortcomings of the older standard. In yet another example, one of ordinary skill in the art would have been motivated to apply the known techniques disclosed in the documents submitted as part of the IEEE 802.11ax standard development process to an older wireless communications system implementing IEEE 802.11ax to yield the predictable results of improved wireless communication performance. Further, one of ordinary skill in the art would have been prompted by the teachings in the documents submitted as part of the IEEE 802.11ax standard development process to modify the wireless communications hardware/device to meet market demands for improved wireless performance.

It would have been obvious to one of ordinary skill in the art at the time to combine teachings of a document submitted as part of IEEE 802.11ax standard development process (*e.g.*, working group documents, draft specification, technical submissions, working group meeting presentations) with teachings of a reference pertaining to hardware/devices (*e.g.*, non-access-point stations) for wireless communications (*e.g.*, wireless local area network (WLAN)). For instance, a person of ordinary skill would have been motivated to combine the teachings of a document

submitted as part of the IEEE 802.11ax standard development process—which generally address narrow technical issues and solutions—with references disclosing WLAN devices and hardware more broadly (*e.g.*, devices with transceivers and configurable processors) to yield a blueprint for a working device that addresses the technical problem disclosed in the IEEE 802.11ax standard development document. Such a combination amounts to combining known prior art elements according to known methods to yield predictable results. Further, to the extent any prior art WLAN devices/hardware documents disclose deficiencies or technical issues with the state of the art, one of ordinary skill in the art would have been prompted to combine these references with the teachings in documents submitted as part of the IEEE 802.11ax standard development process to meet market demands for improved wireless performance. This disclosure of deficiencies and/or technical issues would provide a teaching, suggestion, or motivation for a person of ordinary skill to modify the prior art reference based on the IEEE 802.11ax standard working documents.

It would have been obvious to one of ordinary skill in the art at the time to combine teachings of a document submitted as part of IEEE 802.11ax standard development process (*e.g.*, working group documents, draft specification, technical submissions, working group meeting presentations) with teachings of another document submitted as part of IEEE 802.11ax standard development process. For instance, considering the common underlying technical subject matter of the IEEE 802.11ax standard development documents, it would be obvious to one of ordinary skill to try combining the teachings of multiple documents. In doing so, a person of ordinary skill would have a reasonable expectation of success. Moreover, given the common goals and design incentives among authors of IEEE 802.11ax standard development documents (*e.g.*, improving WLAN device performance), a person of ordinary skill would find it obvious to combine the technical solutions disclosed in multiple IEEE 802.11ax standard development documents.

Further, given the additive nature of the IEEE standard development process, a person of ordinary skill would have understood that various IEEE 802.11ax standard development documents could be combined to create a cohesive solution. A person of ordinary skill would have a reasonable expectation of success in combining the teachings in these documents.

Any reference or combination of references that anticipates or makes obvious an asserted independent claim also makes obvious any asserted claim dependent on that independent claim, as the element of each dependent '597 patent Asserted Claim was known by a person of ordinary skill at the time of the alleged invention, at least partially based on, but not limited by, the claim constructions implicit in Plaintiff's infringement contentions, and it would have been obvious to combine those known elements with the independent claims at least as a matter of common sense and routine innovation. Accordingly, Defendants contend that each Asserted Claim would have been obvious not only by the combinations described in these contentions, but also by any combination of references that renders obvious an Asserted Claim.

In addition to the specific examples of motivation provided above, Defendants reserve the right to rely on the disclosures of the references listed in Appendix H for additional motivation to combine. The above-identified examples of combinations are given merely to illustrate various motivations to combine and are not intended to provide an exhaustive list of every possible combination to which the motivation may apply. Defendants reserve the right to contend that the above-described motivations to combine apply to other combinations at the appropriate time, *i.e.*, in expert reports regarding invalidity.

For at least the reasons described above, it would have been obvious to one of ordinary skill in the art to combine each prior art reference listed in Appendix H with any other reference or references listed in Appendix H along with the knowledge of one of ordinary skill in the art to

arrive at the inventions claims in the '597 patent. For example, and without limitation, the Asserted Claims of the '597 patent would have been obvious to one of ordinary skill in the art in view of the following combinations:

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2017/0223731 (“Lee 731”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
WO 2016/021858 (“Lee 858”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
Evgeny Khorov et al., <i>IEEE 802.11ax: How to Build High Efficiency WLANs</i> , 2015 Int'l Conf. on Eng'g & Telecomm. 14-19 (2015) ("Khorov")	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 ("Lee 731") • WO 2016/021858 ("Lee 858") • IEEE P802.11 802.11-16/0024r1 "Proposed TGax draft specification" ("Stacey 0024") • IEEE 802.11-16/0042r2 "BSS Color Settings for a Multiple BSSID Set" ("Ko 0042") • US 2016/0249397 ("Seok 397") • US 10,666,368 ("Barriac 368") • US 10,321,485 ("Noh 485") • US 2016/0345258 ("Zhou 258") • US 2021/0243787 ("Oteri 787") • US 2017/0127352 ("Park 352") • US 2017/0188306 ("Park 306") • US 2015/0124744 ("Zhu 744") • WO 2017/031640 ("Du 640") • US 2017/0078887 ("Barriac 887") • IEEE 802.11-16/0396r0 "Issues on BSS Color Collision" ("Ko 0396") • US 2016/0330663 ("Zhou 663") • EP 2986066A ("Nelson 066") • US 2019/082387 ("Kim 387") • US 2016/330685 ("Asterjadhi 685") • US 2017/257817 ("Itagaki 817") • IEEE Std 802.11-2012 ("802.11-2012") • IEEE Std 802.11ac ("802.11ac") • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2016/0249397 (“Seok 397”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 10,666,368 (“Barriac 368”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 10,321,485 (“Noh 485”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2016/0345258 (“Zhou 258”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2021/0243787 (“Oteri 787”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2017/0127352 (“Park 352”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
WO 2017/031640 (“Du 640”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2017/0188306 (“Park 306”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2015/0124744 (“Zhu 744”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2017/0078887 (“Barriac 887”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2016/0330663 (“Zhou 663”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
EP 2986066A (“Nelson 066”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2019/082387 (“Kim 387”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2016/330685 (“Asterjadhi 685”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
US 2017/257817 (“Itagaki 817”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
IEEE Std 802.11-2012 (“802.11-2012”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
IEEE Std 802.11ac (“Wi-Fi 5”)	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ax/D1.0 • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
IEEE Std 802.11ax/D1.0	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • Systems implementing IEEE 802.11ac • Knowledge of a person of ordinary skill

Patent No. or Title (Primary Inventor/Author)	In Combination with One or More of: (Patent No. or Title Primary Inventor/Author)
Systems implementing IEEE 802.11ac	<ul style="list-style-type: none"> • Asserted Patents Admitted Prior Art (APA) • US 2017/0223731 (“Lee 731”) • WO 2016/021858 (“Lee 858”) • IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”) • IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) • Evgeny Khorov et al., IEEE 802.11ax: How to Build High Efficiency WLANs, 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”) • US 2016/0249397 (“Seok 397”) • US 10,666,368 (“Barriac 368”) • US 10,321,485 (“Noh 485”) • US 2016/0345258 (“Zhou 258”) • US 2021/0243787 (“Oteri 787”) • US 2017/0127352 (“Park 352”) • US 2017/0188306 (“Park 306”) • US 2015/0124744 (“Zhu 744”) • WO 2017/031640 (“Du 640”) • US 2017/0078887 (“Barriac 887”) • IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”) • US 2016/0330663 (“Zhou 663”) • EP 2986066A (“Nelson 066”) • US 2019/082387 (“Kim 387”) • US 2016/330685 (“Asterjadhi 685”) • US 2017/257817 (“Itagaki 817”) • IEEE Std 802.11-2012 (“802.11-2012”) • IEEE Std 802.11ac (“802.11ac”) • IEEE Std 802.11ax/D1.0 • Knowledge of a person of ordinary skill

As mentioned above, Defendants have not yet completed their search or discovery concerning additional prior art. Moreover, the exemplary combinations are provided based on Defendants’ current understanding of the Asserted Claims and Plaintiff’s apparent view of the scope of those claims as shown, for example, in Plaintiff’s Infringement Contentions. Further, a

Markman Order has not yet been issued in this case. As such, Defendants’ inclusion of exemplary combinations does not preclude them from identifying other invalidating combinations as appropriate, and Defendants reserve the right to identify additional specific combinations as well as to detail and explain such combinations.

C. Improper Inventorship

The Asserted Patents, including all Asserted Claims, are invalid for failure to comply with 35 U.S.C. §§ 101, 115, 282, on the grounds that the purported inventors did not themselves invent the subject matter sought to be patented, resulting in improper inventorship. Specifically, the inventors of Asserted Patents derived their purported inventions from others, and/or one or more joint inventors who conceived significant parts of the purported inventions were not named as inventors on the Asserted Patents.

1. U.S. Patent No. 10,313,077

The ’077 patent, including all asserted claims therein, are invalid on the grounds that the inventors of the ’077 patent derived their purported inventions from others. Table 3-A provides an identification, by the name of the person(s), from whom the purported invention was derived, and the circumstances of derivation are explained below.

Table 3-A: Prior Art under § 102 for the ’077 patent

No.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RA-1	Bharadwaj 202	<ul style="list-style-type: none"> • Arjun Bharadwaj • Bin Tian
RA-2	Cao 067	<ul style="list-style-type: none"> • Rui Cao • Xiayu Zheng • Hongyuan Zhang
RA-3	802.11-15/0810	<ul style="list-style-type: none"> • Hongyuan Zhang • Arjun Bharadwaj • Rui Cao • Others listed on 802.11-15/0810

No.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RA-4	Yu 012	<ul style="list-style-type: none"> • Heejung Yu • Daewon Lee • Young Hoon Kwon • Sungho Moon • Yujin Noh
RA-6	Lin 929	<ul style="list-style-type: none"> • Meilu Lin • Yun Liu
RA-8	Cao 476	<ul style="list-style-type: none"> • Rui Cao • Xiayu Zheng • Hongyuan Zhang

For example, Juhyung Son (a.k.a. John Son, Ju-Hyung Son)—an inventor of the '077 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” (“TGax”) meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, May 2015, July 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Juhyung Son was aware of the submissions, frameworks, and draft standards for IEEE 802.11ax being discussed, considered, and voted upon at those meetings, including technical submissions by non-Wilus contributors such as 802.11-15/0810. Juhyung Son derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '077 patent.

Further, for example, Jinsam Kwak—an inventor of the '077 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May

2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Jinsam Kwak was aware of the submissions, frameworks, and draft standards for IEEE 802.11ax being discussed, considered, and voted upon at those meetings, including technical submissions by non-Wilus contributors such as 802.11-15/0810. Jinsam Kwak derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '077 patent.

Further, for example, Geonjung Ko—an inventor of the '077 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Geonjung Ko was aware of the submissions, frameworks, and draft standards for IEEE 802.11ax being discussed, considered, and voted upon at those meetings, including technical submissions by non-Wilus contributors such as 802.11-15/0810. Geonjung Ko derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '077 patent.

Further, many of the inventors of the prior art references listed in Table 3-A above were members of Task Group AX. *See e.g.*, 802.11-15/0810 (identifying as task group members, *e.g.*,

Hongyuan Zhang, Rui Cao, Arjun Bharadwaj, and Bin Tian, who are authors/inventors of the prior art listed above in Table 3-A). Thus, by virtue of their attendance at the Task Group AX meetings, Juhyung Son, Jin Sam Kwak, and/or Geonjung Ko were aware of the subject matter of the prior art references listed in Table 3-A and what was discussed at those meetings, and derived this information in connection with filing a patent application that led to the '077 patent.

Moreover, the listed inventors Juhyung Son, Jin Sam Kwak, and/or Geonjung Ko frequently collaborated with other WILUS employees and Yonsei University employees, such as Minseok Noh, Jinsoo Ahn, Ronny Yongho Kim, Hanseul Hong, Kukil Lim, Jinho Lee, Young-Chai Ko, Yongho Seok *See e.g.*, IEEE 11-16-1425, “Clarification on applying MU EDCA parameter set,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1425-02-00ax-clarification-on-applying-mu-edca-parameter-set.pptx>; IEEE 11-16-1424, “Issue on the CWmax value in MU EDCA,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1424-02-00ax-issue-on-the-cwmax-value-in-mu-edca.pptx>; IEEE 11-14-0838, “Discussion on dual-link STR in IEEE 802.11ax,” <https://mentor.ieee.org/802.11/dcn/14/11-14-0838-01-00ax-discussion-on-dual-link-str-in-ieee-802-11ax.pptx>; IEEE 11-16-0352, “Consideration on MU initial link setup,” <https://mentor.ieee.org/802.11/dcn/16/11-16-0352-01-00ax-considerations-on-mu-initial-link-setup.pptx>; IEEE 11-16-0641, “Regarding HE fragmentation,” <https://mentor.ieee.org/802.11/dcn/16/11-16-0641-02-00ax-regarding-he-fragmentation.pptx>; IEEE 11-16-0916, “TID value of ALL ACK signaling,” <https://mentor.ieee.org/802.11/dcn/16/11-16-0917-01-00ax-text-for-tid-value-of-all-ack-signaling.docx>; IEEE 11-16-1426, “DL/UL indication in MU-RTS,” <https://mentor.ieee.org/802.11/dcn/16/11-16-1426-00-00ax-dl-ul-indication-in-mu-rts.pptx>. By virtue of their collaborations, one or more of the listed inventors

was aware of the claimed subject matter invented by these collaborators, and derived this information in connection with filing a patent application that led to the '077 patent.

To the extent that the '077 patent includes patentable subject matter with respect to any Asserted Claims, the '077 patent fails to name all inventors. As an example, the subject matter of one or more of the Asserted Claims of the '077 patent, at least as the claims are apparently being interpreted by Wilus, was disclosed in IEEE 802.11-15/0810r0 "HE PHY Padding and Packet Extension" ("802.11-15/0810"). This prior art reference was authored by several of the authors of other prior art references in Table 3-A, such as Arjun Bharadwaj, Hongyuan Zhang, and Rui Cao. As demonstrated in the accompanying charts, IEEE 802.11-15/0810r0 discloses at least one claim element of the Asserted Claims of the '077 patent. IEEE 802.11-15/0810r0 demonstrates that other authors are inventors of the subject matter of the '077 patent, despite not being listed as a named inventor thereon. *See Ex. A-03.*

Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

2. U.S. Patent No. 11,159,210

The '210 patent, including all asserted claims therein, are invalid on the grounds that the inventors of the '210 patent derived their purported inventions from others. Table 3-B provides an identification, by the name of the person(s), from whom the purported invention was derived, and the circumstances of derivation are explained below.

Table 3-B: Prior Art under § 102 for the '210 patent

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RB-1	Bharadwaj 136	<ul style="list-style-type: none"> • Arjun Bharadwaj • Bin Tian • Lochan Verma • Sameer Vermani

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RB-2	Lim 066	<ul style="list-style-type: none"> • Dongguk Lim • Jinsoo Choi • Hangyu Cho • Eunsung Park • Wookbong Lee
RB-3	IEEE P802.11ax/D1.0	<ul style="list-style-type: none"> • TGax Members
RB-5	IEEE 802.11-15/0132r15	<ul style="list-style-type: none"> • TGax Members
RB-6	Verma 310	<ul style="list-style-type: none"> • Lochan Verma • Bin Tian • Sameer Vermani • Lin Yang
RB-7	Hedayat 526	<ul style="list-style-type: none"> • Ahmad Reza Hedayat
RB-8	Bharadwaj 718	<ul style="list-style-type: none"> • Arjun Bharadwaj • Bin Tian • Sameer Vermani
RB-11	IEEE P802.11ax/D0.5	<ul style="list-style-type: none"> • TGax Members

For example, Juhung Son (a.k.a. John Son, Ju-Hyung Son)—an inventor of the ’210 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, May 2015, July 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Juhung Son was aware of the submissions, frameworks, and draft standards for IEEE 802.11ax being discussed, considered, and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE P802.11ax/D0.5, IEEE P802.11ax/D1.0, as well as prior drafts of it. Juhung Son derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the ’210 patent.

Further, for example, Jinsam Kwak—an inventor of the '210 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Jinsam Kwak was aware of the submissions, frameworks, and draft standards for IEEE 802.11ax being discussed, considered, and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE P802.11ax/D0.5, IEEE P802.11ax/D1.0, as well as prior drafts of it. Jinsam Kwak derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '210 patent.

Further, for example, Geonjung Ko—an inventor of the '210 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Geonjung Ko was aware of the submissions, frameworks, and draft standards for IEEE 802.11ax being discussed, considered, and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE P802.11ax/D0.5, IEEE P802.11ax/D1.0, as well as

prior drafts of it. Geonjung Ko derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '210 patent.

Further, for example, Woojin Ahn—an inventor of the '210 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, July 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Woojin Ahn was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE P802.11ax/D0.5, IEEE P802.11ax/D1.0, as well as prior drafts of it. Woojin Ahn derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '210 patent.

Further, many of the inventors of the prior art references listed in Table 3-B above were members of Task Group AX. *See e.g.*, IEEE 802.11-16/0024r1 “Proposed TGax draft specification” (identifying as task group members, *e.g.*, Arjun Bharadwaj, Bin Tian, Lochan Verma, Sameer Vermani, who are authors/inventors of the prior art listed above in Table 3-B). Thus, by virtue of their attendance at the Task Group AX meetings, Juhyung Son, Jinsam Kwak, Geonjung Ko, and/or Woojin Ahn, were aware of the subject matter of the prior art references listed in Table 3-B and what was discussed at those meetings, and derived this information in connection with filing a patent application that led to the '210 patent.

Moreover, the listed inventors Juhyung Son, Jinsam Kwak, Geonjung Ko, and/or Woojin Ahn frequently collaborated with other WILUS employees and Yonsei University employees, such as Minseok Noh, Jinsoo Ahn, Ronny Yongho Kim, Hanseul Hong, Kukil Lim, Jinho Lee, Young-Chai Ko, Yongho Seok *See e.g.*, IEEE 11-16-1425, "Clarification on applying MU EDCA parameter set," available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1425-02-00ax-clarification-on-applying-mu-edca-parameter-set.pptx>; IEEE 11-16-1424, "Issue on the CWmax value in MU EDCA," available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1424-02-00ax-issue-on-the-cwmax-value-in-mu-edca.pptx>; IEEE 11-14-0838, "Discussion on dual-link STR in IEEE 802.11ax," <https://mentor.ieee.org/802.11/dcn/14/11-14-0838-01-00ax-discussion-on-dual-link-str-in-ieee-802-11ax.pptx>; IEEE 11-16-0352, "Consideration on MU initial link setup," <https://mentor.ieee.org/802.11/dcn/16/11-16-0352-01-00ax-considerations-on-mu-initial-link-setup.pptx>; IEEE 11-16-0641, "Regarding HE fragmentation," <https://mentor.ieee.org/802.11/dcn/16/11-16-0641-02-00ax-regarding-he-fragmentation.pptx>; IEEE 11-16-0916, "TID value of ALL ACK signaling," <https://mentor.ieee.org/802.11/dcn/16/11-16-0917-01-00ax-text-for-tid-value-of-all-ack-signaling.docx>; IEEE 11-16-1426, "DL/UL indication in MU-RTS," <https://mentor.ieee.org/802.11/dcn/16/11-16-1426-00-00ax-dl-ul-indication-in-mu-rts.pptx>. By virtue of their collaborations, one or more of the listed inventors was aware of the claimed subject matter invented by these collaborators, and derived this information in connection with filing a patent application that led to the '210 patent.

To the extent that the '210 patent includes patentable subject matter with respect to any Asserted Claims, the '210 patent fails to name all inventors. As an example, the subject matter of one or more of the Asserted Claims of the '210 patent, at least as the claims are apparently being interpreted by Wilus, was disclosed in IEEE 802.11-15/0132r15 "Specification Framework for

TGax.” This prior art reference relies on material authored by several of the authors of other prior art references in Table 3-B, such as Sameer Vermani and Lochan Verma. As demonstrated in the accompanying charts, IEEE 802.11-15/0132r15 discloses at least one claim element of the Asserted Claims of the ’210 patent. IEEE 802.11-15/0132r15 demonstrates that other authors are inventors of the subject matter of the ’210 patent, despite not being listed as a named inventor thereon. *See* Ex. B-3.

Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

3. U.S. Patent No. 10,687,281

The ’281 patent, including all asserted claims therein, are invalid on the grounds that the inventors of the ’281 patent derived their purported inventions from others. Table 3-C provides an identification, by the name of the person(s), from whom the purported invention was derived, and the circumstances of derivation are explained below.

Table 3-C: Prior Art under § 102 for the ’281 patent

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RC-1	US 2017/0181129A1 (“Bharadwaj 129”)	<ul style="list-style-type: none"> • Arjun Bharadwaj • Bin Tian • Lochan VERMA • Sameer Vermani
RC-2	US 2017/0094664A1 (“Lee”)	<ul style="list-style-type: none"> • Dae Won Lee • Yujin Noh • Sungho Moon • Young Hoon Kwon
RC-3	US 2016/0353322A1 (“Li”)	<ul style="list-style-type: none"> • Qinghua Li • Xiaogang Chen • Yuan Zhu • Huaning Niu • Hujun Yin
RC-4	US 10,219,271B1 (“Hedayat”)	<ul style="list-style-type: none"> • Ahmad Reza HEDAYAT • Amin Jafarian

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RC-5	US 2017/0064718A1 (“Bharadwaj 718”)	<ul style="list-style-type: none"> • Arjun Bharadwaj • Bin Tian • Sameer Vermani
RC-6	US 2016/0330058A1 (“Chen”)	<ul style="list-style-type: none"> • Xiaogang Chen • Qinghua Li • Robert Stacey • Yuan Zhu • Chittabrata Ghosh • Po-Kai Huang • Rongzhen Yang • Huaning Niu • Jeongho Jeon
RC-7	JP 2015-165676A (“Kim”)	<ul style="list-style-type: none"> • Youhan Kim • Zhang Ning
RC-8	US 2016/0330300A1 (“Josiam”)	<ul style="list-style-type: none"> • Kaushik M. Josiam • Rakesh Taori
RC-9	IEEE Std 802.11ac (“802.11ac”)	<ul style="list-style-type: none"> • Various authors
RC-10	IEEE 802.11-16/ 0045r1	<ul style="list-style-type: none"> • John (Ju-Hyung) Son • Geonjung Ko • Minseok Noh • Jin Sam Kwak
RC-11	IEEE 802.11-15/ 0344r2	<ul style="list-style-type: none"> • Young Hoon Kwon • Sungho Moon • Daewon Lee • Minh Cheong • Heejung Yu
RC-12	IEEE 802.11-14/ 1437r1	<ul style="list-style-type: none"> • Jinsoo Anh • Woojin Ahn • Ronny Yongho Kim
RC-13	US 2016/0174200A1 (“Seok”)	<ul style="list-style-type: none"> • Yongho Seok

For example, Juhung Son (a.k.a. John Son, Ju-Hyung Son)—an inventor of the ’281 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, May 2015, July 2015 September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016,

January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Juhyung Son was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Juhyung Son derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '281 patent.

Further, for example, Jinsam Kwak—an inventor of the '281 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Jinsam Kwak was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Jinsam Kwak derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '281 patent.

Further, for example, Geonjung Ko—an inventor of the '281 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, January 2015, May 2015, March 2015,

September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Geonjung Ko was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Geonjung Ko derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '281 patent.

Woojin Ahn—an inventor of the '281 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, July 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Woojin Ahn was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Woojin Ahn derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '281 patent.

Moreover, the listed inventors John (Ju-Hyung) Son, Jin Sam Kwak, Geonjung Ko, and/or Woojin Ahn frequently collaborated with other WILUS employees and Yonsei University

employees, such as Minseok Noh, Jinsoo Ahn, Ronny Yongho Kim, Hanseul Hong, Kukil Lim, Jinho Lee, Young-Chai Ko, Yongho Seok *See, e.g.*, IEEE 11-16-1425, "Clarification on applying MU EDCA parameter set," available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1425-02-00ax-clarification-on-applying-mu-edca-parameter-set.pptx>; IEEE 11-16-1424, "Issue on the CWmax value in MU EDCA," available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1424-02-00ax-issue-on-the-cwmax-value-in-mu-edca.pptx>; IEEE 11-14-0838, "Discussion on dual-link STR in IEEE 802.11ax," <https://mentor.ieee.org/802.11/dcn/14/11-14-0838-01-00ax-discussion-on-dual-link-str-in-ieee-802-11ax.pptx>; IEEE 11-16-0352, "Consideration on MU initial link setup," <https://mentor.ieee.org/802.11/dcn/16/11-16-0352-01-00ax-considerations-on-mu-initial-link-setup.pptx>; IEEE 11-16-0641, "Regarding HE fragmentation," <https://mentor.ieee.org/802.11/dcn/16/11-16-0641-02-00ax-regarding-he-fragmentation.pptx>; IEEE 11-16-0916, "TID value of ALL ACK signaling," <https://mentor.ieee.org/802.11/dcn/16/11-16-0917-01-00ax-text-for-tid-value-of-all-ack-signaling.docx>; IEEE 11-16-1426, "DL/UL indication in MU-RTS," <https://mentor.ieee.org/802.11/dcn/16/11-16-1426-00-00ax-dl-ul-indication-in-mu-rts.pptx>. By virtue of their collaborations, one or more of the listed inventors was aware of the claimed subject matter invented by these collaborators. *See, e.g.*, US2016/0174200 ("Seok").

To the extent that the '281 patent includes patentable subject matter with respect to any Asserted Claims, the '281 patent fails to name all inventors. As an example, the subject matter of one or more of the Asserted Claims of the '281 patent, at least as the claims are apparently being interpreted by Wilus, was disclosed in IEEE 802.11-15/ 0344r2. This prior art reference was drafted by Young Hoon Kwon, Sungho Moon, Daewon Lee, Minhong Cheong, and Heejung Yu, as demonstrated in the accompanying charts, IEEE 802.11-15/ 0344r2 discloses at least one claim

element of the Asserted Claims of the '281 patent. IEEE 802.11-15/ 0344r2 demonstrates that Young Hoon Kwon, Sungho Moon, Daewon Lee, Minhoo Cheong, and Heejung Yu are inventors of the subject matter of the '281 patent, despite not being listed as a named inventor thereon. *See* Ex. C11.

Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

4. U.S. Patent No. 11,470,595

The '595 patent, including all asserted claims therein, are invalid on the grounds that the inventors of the '595 patent derived their purported inventions from others. Table 3-D provides an identification, by the name of the person(s), from whom the purported invention was derived, and the circumstances of derivation are explained below.

Table 3-D: Prior Art under § 102 for the '595 patent

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RD-1	US 2017/0181129A1 (“Bharadwaj 129”)	<ul style="list-style-type: none"> • Arjun Bharadwaj • Bin Tian • Lochan VERMA • Sameer Vermani
RD-2	US 2017/0094664A1 (“Lee”)	<ul style="list-style-type: none"> • Dae Won Lee • Yujin Noh • Sungho Moon • Young Hoon Kwon
RD-3	US 2016/0353322A1 (“Li”)	<ul style="list-style-type: none"> • Qinghua Li • Xiaogang Chen • Yuan Zhu • Huaning Niu • Hujun Yin
RD-4	US 10,219,271B1 (“Hedayat”)	<ul style="list-style-type: none"> • Ahmad Reza HEDAYAT • Amin Jafarian
RD-5	US 2017/0064718A1 (“Bharadwaj 718”)	<ul style="list-style-type: none"> • Arjun Bharadwaj • Bin Tian • Sameer Vermani
RD-6	US 2016/0330058A1 (“Chen”)	<ul style="list-style-type: none"> • Xiaogang Chen

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
		<ul style="list-style-type: none"> • Qinghua Li • Robert Stacey • Yuan Zhu • Chittabrata Ghosh • Po-Kai Huang • Rongzhen Yang • Huaning Niu • Jeongho Jeon
RD-7	JP 2015-165676A (“Kim”)	<ul style="list-style-type: none"> • Youhan Kim • Zhang Ning
RD-8	US 2016/0330300A1 (“Josiam”)	<ul style="list-style-type: none"> • Kaushik M. Josiam • Rakesh Taori
RD-9	US 2018/0205584A1 (“Lim”)	<ul style="list-style-type: none"> • Dongguk Lim • Jinsoo Choi • HanGyu CHO • Jinmin Kim • Eunsung Park
RD-10	US 2017/0070998A1 (“Wu”)	<ul style="list-style-type: none"> • Tianyu Wu • Shengquan Hu • Jianhan Liu • Thomas Edward Pare, Jr.
RD-11	IEEE Std 802.11ac (“802.11ac”)	<ul style="list-style-type: none"> • Various authors
RD-12	IEEE 802.11-15/ 1304r1	<ul style="list-style-type: none"> • Sungho Moon • Daewon Lee • Yujin Noh • Munho Cheong • Heejung Yu
RD-13	IEEE 802.11-14/ 1437r1	<ul style="list-style-type: none"> • Jinsoo Anh • Woojin Ahn • Ronny Yongho Kim
RD-14	IEEE 802.11-16/ 0045r1	<ul style="list-style-type: none"> • John (Ju-Hyung) Son • Geonjung Ko • Minseok Noh • Jin Sam Kwak
RD-15	IEEE 802.11-15/ 1066r0	<ul style="list-style-type: none"> • Kaushik Josiam • Rakesh Taori • Sanghyum Change • Hyunjeong Kang • Mark Rison • Fei Tong • Other authors

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RD-16	US 2016/0174200A1 (“Seok”)	<ul style="list-style-type: none"> <li>• Yongho Seok

For example, Juhyung Son (a.k.a. John Son, Ju-Hyung Son)—an inventor of the ’595 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, May 2015, July 2015 September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Juhyung Son was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Juhyung Son derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the ’595 patent.

Further, for example, Jinsam Kwak—an inventor of the ’595 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Jinsam Kwak was aware of the draft and final specifications for 802.11ax being

considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Jinsam Kwak derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '595 patent.

Geonjung Ko—an inventor of the '595 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Geonjung Ko was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Geonjung Ko derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '595 patent.

Further, for example, Woojin Ahn—an inventor of the '595 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, July 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm.

By virtue of his attendance at those meetings, Woojin Ahn was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Woojin Ahn derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '281 patent.

Moreover, the listed inventors John (Ju-Hyung) Son, Jin Sam Kwak, Geonjung Ko, and/or Woojin Ahn frequently collaborated with other WILUS employees and Yonsei University employees, such as Minseok Noh, Jinsoo Ahn, Ronny Yongho Kim, Hanseul Hong, Kukil Lim, Jinho Lee, Young-Chai Ko, Yongho Seok *See, e.g.*, IEEE 11-16-1425, "Clarification on applying MU EDCA parameter set," available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1425-02-00ax-clarification-on-applying-mu-edca-parameter-set.pptx>; IEEE 11-16-1424, "Issue on the CWmax value in MU EDCA," available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1424-02-00ax-issue-on-the-cwmax-value-in-mu-edca.pptx>; IEEE 11-14-0838, "Discussion on dual-link STR in IEEE 802.11ax," <https://mentor.ieee.org/802.11/dcn/14/11-14-0838-01-00ax-discussion-on-dual-link-str-in-ieee-802-11ax.pptx>; IEEE 11-16-0352, "Consideration on MU initial link setup," <https://mentor.ieee.org/802.11/dcn/16/11-16-0352-01-00ax-considerations-on-mu-initial-link-setup.pptx>; IEEE 11-16-0641, "Regarding HE fragmentation," <https://mentor.ieee.org/802.11/dcn/16/11-16-0641-02-00ax-regarding-he-fragmentation.pptx>; IEEE 11-16-0916, "TID value of ALL ACK signaling," <https://mentor.ieee.org/802.11/dcn/16/11-16-0917-01-00ax-text-for-tid-value-of-all-ack-signaling.docx>; IEEE 11-16-1426, "DL/UL indication in MU-RTS," <https://mentor.ieee.org/802.11/dcn/16/11-16-1426-00-00ax-dl-ul-indication-in-mu-rts.pptx>. By virtue of their collaborations, one or more of the listed inventors

was aware of the claimed subject matter invented by these collaborators. *See, e.g.*, US2016/0174200 (“Seok”).

To the extent that the ’595 patent includes patentable subject matter with respect to any Asserted Claims, the ’595 patent fails to name all inventors. As an example, the subject matter of one or more of the Asserted Claims of the ’595 patent, at least as the claims are apparently being interpreted by Wilus, was disclosed in IEEE 802.11-15/1304r1. This prior art reference was drafted by Sungho Moon, Daewon Lee, Yujin Noh, Munho Cheong, Heejung Yu, as demonstrated in the accompanying charts, IEEE 802.11-15/1304r1 discloses at least one claim element of the Asserted Claims of the ’595 patent. IEEE 802.11-15/1304r1 demonstrates that Sungho Moon, Daewon Lee, Yujin Noh, Munho Cheong, Heejung Yu are inventors of the subject matter of the ’595 patent, despite not being listed as a named inventor thereon. *See* Ex. D12.

Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

5. U.S. Patent No. 11,116,035

The ’035 patent, including all asserted claims therein, are invalid on the grounds that the inventors of the ’035 patent derived their purported inventions from others. Table 3-E provides an identification, by the name of the person(s), from whom the purported invention was derived, and the circumstances of derivation are explained below.

Table 3-E: Prior Art under § 102 for the ’035 patent

No.	Patent No. or Title (Primary Inventor/Author)	Name of Person(s) from Whom Invention was Derived
RE-1	IEEE 802.11-16/1180r0 and r1, “Proposed spec text for MU EDCA parameters” (“Cariou 1180”)	<ul style="list-style-type: none"> • Individuals identified as authors in Cariou 1180 at pp. 1-5
RE-2	US 9,585,166 (“Seok 166”)	<ul style="list-style-type: none"> • Yong Ho Seok
RE-3	Hybrid adaptation of the maximum contention window (CWmax) and minimum contention	<ul style="list-style-type: none"> • Hassan Takabi • Ali Moghadam

No.	Patent No. or Title (Primary Inventor/Author)	Name of Person(s) from Whom Invention was Derived
	window (CWmin) for Enhanced Service Differentiation in IEEE 802.11 Wireless Ad-hoc Networks (“Takabi”)	<ul style="list-style-type: none"> • Ahmad Khonsari
RE-4	IEEE 802.11-15/0132r17 “Wireless LANs Specification Framework for TGax” (“Stacey 0132”)	<ul style="list-style-type: none"> • Robert Stacey
RE-5	IEEE 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”)	<ul style="list-style-type: none"> • Individuals identified as authors in Stacey 0024 at pp. 1-5
RE-6	IEEE 802.11-16/0998r1 “2 sets of EDCA parameter,” (“Cariou 0998”)	<ul style="list-style-type: none"> • Individuals identified as authors in Cariou 0998 at pp. 1-11
RE-7	IEEE 802.11-16/0963r3 “EDCA rules – follow up 2” (“Ma 0963”)	<ul style="list-style-type: none"> • Jing Ma • Kentaro Ishizu • Fumihide Kojima
RE-8	US 2017/0245261 (“Cariou 261”)	<ul style="list-style-type: none"> • Laurent Cariou • Po-Kai Huang • Chittabrata Ghosh • Robert J. Stacey
RE-9	US 2016/0198500 (“Merlin 500”)	<ul style="list-style-type: none"> • Simone Merlin • Gang Ding
RE-10	US 2018/0146476 A1 (Kim ’476)	<ul style="list-style-type: none"> • Jeongki Kim • Kiseon Ryu • Hangyu Cho
RE-11	US 2016/0128102 A1 (“Jauh ’102”)	<ul style="list-style-type: none"> • Yuh-Ren Jaub • Ching-Hwa Yu • James June-Ming Wang • Chao-Chun Wang
RE-12	US 2018/0352572 (“Cariou 572”)	<ul style="list-style-type: none"> • Laurent Cariou • Yaron Alpert • Chittabrata Ghosh • Po-Kai Huang • Robert J. Stacey
RE-13	CN 102958185 (“Huawei 185”)	<ul style="list-style-type: none"> • Guorui Yang, • Xuehuan Wang • Menghong Liu
RE-14	US 2011/0235596 (“Wentink 596”)	<ul style="list-style-type: none"> • Maarten Menzo Wentink
RE-15	US 2017/0325264 (“Cherian 264”)	<ul style="list-style-type: none"> • George Cherian • Alfred Asterjadhi • Simone Merlin

No.	Patent No. or Title (Primary Inventor/Author)	Name of Person(s) from Whom Invention was Derived
		<ul style="list-style-type: none"> • Gwendolyn Denise Barriac • Yan Zhou
RE-16	US 2017/0223730 (“Jiang 730”)	<ul style="list-style-type: none"> • Jinjing Jiang • Liwen Chu • Lei Wang • Yakun Sun • Hongyuan Zhang • Hui-Ling Lou
RE-17	IEEE 802.11ac Specification	<ul style="list-style-type: none"> • Members of Task Group ac
RE-18	IEEE 802.11-2012 & 802.11-2016 Specification	<ul style="list-style-type: none"> • Members of Task Group ac
RE-19	US 2017/0208625 (“Choi 625”)	<ul style="list-style-type: none"> • Hyeyoung Choi • Kiseon Ryu • Jeongki Kim • Hangyu Cho • Suhwook Kim • Kwangseok Noh
RE-20	IEEE 802.11-16/0535r0 “Comments on TGax/D0.1” (“Stacey 0535”)	<ul style="list-style-type: none"> • Robert Stacey
RE-21	US 2017/0048048 (“Seok 048”)	<ul style="list-style-type: none"> • Yongho Seok
RE-22	US 2017/0202023 (“Zhou 023”)	<ul style="list-style-type: none"> • Yan Zhou • Simone Merlin • Gwendolyn Denise Barriac • Alfred Asterjadhi • George Cherian
RE-23	IEEE 802.11-16/1425r2 “Clarification on applying MU EDCA parameter set” (“Ahn 1425”)	<ul style="list-style-type: none"> • Minseok Noh
RE-24	US 2018/0034595 (“Kim 595”)	<ul style="list-style-type: none"> • Jeongki Kim • Kiseon Ryu • Hangyu Cho
RE-25	IEEE 802.11-16/0616r2 “Block Ack Generation and Selection Rules” (“Asterjadhi 0616”)	<ul style="list-style-type: none"> • Individuals identified as authors in Asterjadhi 0616 at pp. 1-8
RE-26	IEEE 802.11-16/1424r1 “Issue on the CWmax value in MU EDCA” (“Ahn 1424”)	<ul style="list-style-type: none"> • Minseok Noh
RE-27	IEEE P802.11ax/D1.0 (“802.11ax D1.0”)	<ul style="list-style-type: none"> • Members of Task Group ax

For example, Woojin Ahn – an inventor of the '035 patent – regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, July 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Woojin Ahn was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Woojin Ahn derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '035 patent.

Further, for example, Juhyung Son – an inventor of the '035 patent – regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, May 2015, July 2015 September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Juhyung Son was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Juhyung Son derived

the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '035 patent.

Further, for example, Geonjung Ko – an inventor of the '035 patent – regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, January 2015, May 2015, March 2015m, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Geonjung Ko was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Geonjung Ko derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '035 patent.

Further, for example, Jinsam Kwak – an inventor of the '035 patent – regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Jinsam Kwak was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus

contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Jinsam Kwak derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '035 patent.

Further, many of the inventors of the prior art references listed in Table 3-E above were members of Task Group AX. *See e.g.*, IEEE 802.11-16/0024r1 “Proposed TGax draft specification” (identifying as task group members, *e.g.*, Laurent Cariou, Robert Stacey, Simone Merlin, Jing Ma, Jeongki Kim, Kiseon Ryu, Hangyu Cho, Maarten Menzo Wentink, George Cherian, Alfred Asterjadhi, Gwendolyn Denise Barriac, Yongho Seok, who are authors/inventors of the prior art listed above in Table 3-E). Thus, by virtue of his attendance at the Task Group AX meetings, Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, and/or Jin Sam Kwak was aware of the subject matter of the prior art references listed in Table 3-E and that were discussed at those meetings, and derived this information in connection with filing a patent application that led to the '035 patent.

Moreover, the listed inventors Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, and/or Jin Sam Kwak frequently collaborated with other WILUS employees and Yonsei University employees, such as Minseok Noh, Jinsoo Ahn, Ronny Yongho Kim, Hanseul Hong, Kukil Lim, Jinho Lee, Young-Chai Ko, Yongho Seok *See e.g.*, IEEE 11-16-1425, “Clarification on applying MU EDCA parameter set,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1425-02-00ax-clarification-on-applying-mu-edca-parameter-set.pptx>; IEEE 11-16-1424, “Issue on the CWmax value in MU EDCA,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1424-02-00ax-issue-on-the-cwmax-value-in-mu-edca.pptx>; IEEE 11-14-0838, “Discussion on dual-link STR in IEEE 802.11ax,” <https://mentor.ieee.org/802.11/dcn/14/11-14-0838-01-00ax-discussion-on-dual-link-str-in-ieee-802-11ax.pptx>; IEEE 11-16-0352, “Consideration on MU initial link

setup,” <https://mentor.ieee.org/802.11/dcn/16/11-16-0352-01-00ax-considerations-on-mu-initial-link-setup.pptx>; IEEE 11-16-0641, “Regarding HE fragmentation,” <https://mentor.ieee.org/802.11/dcn/16/11-16-0641-02-00ax-regarding-he-fragmentation.pptx>; IEEE 11-16-0916, “TID value of ALL ACK signaling,” <https://mentor.ieee.org/802.11/dcn/16/11-16-0917-01-00ax-text-for-tid-value-of-all-ack-signaling.docx>; IEEE 11-16-1426, “DL/UL indication in MU-RTS,” <https://mentor.ieee.org/802.11/dcn/16/11-16-1426-00-00ax-dl-ul-indication-in-mu-rts.pptx>. By virtue of their collaborations, one or more of the listed inventors was aware of the claimed subject matter invented by these collaborators, and derived this information in connection with filing a patent application that led to the '035 patent. *See e.g.*, US 2017/0048048 (“Seok 048”); US 9,585,166 (“Seok 166”).

To the extent that the '035 patent includes patentable subject matter with respect to any Asserted Claims, the '035 patent fails to name all inventors. As an example, the subject matter of one or more of the Asserted Claims of the '035 patent, at least as the claims are apparently being interpreted by Wilus, was disclosed in IEEE 802.11-16/1425r2 “Clarification on applying MU EDCA parameter set” (“Ahn 1425) and IEEE 802.11-16/1424r1 “Issue on the CWmax value in MU EDCA” (“Ahn 1424”). These two prior art references were drafted by Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, Minseok Noh, Jin Sam Kwak. As demonstrated in the accompanying charts, Ahn 1424 and Ahn 1425 each discloses at least one claim element of the Asserted Claims of the '035 patent. Ahn 1424 and Ahn 1425 each demonstrates that Minseok Noh is an inventor of the subject matter of the '035 patent, despite not being listed as a named inventor thereon. *See* Ex. E23 & E26.

Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

6. U.S. Patent No. 11,516,879

The '879 patent, including all asserted claims therein, are invalid on the grounds that the inventors of the '879 patent derived their purported inventions from others. Table 3-F provides an identification, by the name of the person(s), from whom the purported invention was derived, and the circumstances of derivation are explained below.

Table 3-F: Prior Art under § 102 for the '879 patent

No.	Patent No. or Title (Primary Inventor/Author)	Name of Person(s) from Whom Invention was Derived
RF-1	IEEE 802.11-16/1180r0 and r1, "Proposed spec text for MU EDCA parameters" ("Cariou 1180")	<ul style="list-style-type: none"> • Individuals identified as authors in Cariou 1180 at pp. 1-5
RF-2	US 9,585,166 ("Seok 166")	<ul style="list-style-type: none"> • Yong Ho Seok
RF-3	Hybrid adaptation of the maximum contention window (CWmax) and minimum contention window (CWmin) for Enhanced Service Differentiation in IEEE 802.11 Wireless Ad-hoc Networks ("Takabi")	<ul style="list-style-type: none"> • Hassan Takabi • Ali Moghadam • Ahmad Khonsari
RF-4	IEEE 802.11-15/0132r17 "Wireless LANs Specification Framework for TGax" ("Stacey 0132")	<ul style="list-style-type: none"> • Robert Stacey
RF-5	IEEE 802.11-16/0024r1 "Proposed TGax draft specification" ("Stacey 0024")	<ul style="list-style-type: none"> • Individuals identified as authors in Stacey 0024 at pp. 1-5
RF-6	IEEE 802.11-16/0998r1 "2 sets of EDCA parameter," ("Cariou 0998")	<ul style="list-style-type: none"> • Individuals identified as authors in Cariou 0998 at pp. 1-11
RF-7	IEEE 802.11-16/0963r3 "EDCA rules – follow up 2" ("Ma 0963")	<ul style="list-style-type: none"> • Jing Ma • Kentaro Ishizu • Fumihide Kojima
RF-8	US 2017/0245261 ("Cariou 261")	<ul style="list-style-type: none"> • Laurent Cariou • Po-Kai Huang • Chittabrata Ghosh • Robert J. Stacey
RF-9	US 2016/0198500 ("Merlin 500")	<ul style="list-style-type: none"> • Simone Merlin • Gang Ding
RF-10	US 2018/0146476 A1 (Kim '476)	<ul style="list-style-type: none"> • Jeongki Kim • Kiseon Ryu • Hangyu Cho
RF-11	US 2016/0128102 A1 ("Jauh '102")	<ul style="list-style-type: none"> • Yuh-Ren Jaub

No.	Patent No. or Title (Primary Inventor/Author)	Name of Person(s) from Whom Invention was Derived
		<ul style="list-style-type: none"> • Ching-Hwa Yu • James June-Ming Wang • Chao-Chun Wang
RF-12	US 2018/8792572 (“Carious 572”)	<ul style="list-style-type: none"> • Laurent Cariou • Yaron Alpert • Chittabrata Ghosh • Po-Kai Huang • Robert J. Stacey
RF-13	CN 102958185 (“Huawei 185”)	<ul style="list-style-type: none"> • Guorui Yang, • Xuehuan Wang • Menghong Liu
RF-14	US 2011/0235596 (“Wentink 596”)	<ul style="list-style-type: none"> • Maarten Menzo Wentink
RF-15	US 2017/0325264 (“Cherian 264”)	<ul style="list-style-type: none"> • George Cherian • Alfred Asterjadhi • Simone Merlin • Gwendolyn Denise Barriac • Yan Zhou
RF-16	US 2017/0223730 (“Jiang 730”)	<ul style="list-style-type: none"> • Jinjing Jiang • Liwen Chu • Lei Wang • Yakun Sun • Hongyuan Zhang • Hui-Ling Lou
RF-17	IEEE 802.11ac Specification	<ul style="list-style-type: none"> • Members of Task Group ac
RF-18	IEEE 802.11-2012 & 802.11-2016 Specification	<ul style="list-style-type: none"> • Members of Task Group ac
RF-19	US 2017/0208625 (“Choi 625”)	<ul style="list-style-type: none"> • Hyeyoung Choi • Kiseon Ryu • Jeongki Kim • Hangyu Cho • Suhwook Kim • Kwangseok Noh
RF-20	IEEE 802.11-16/0535r0 “Comments on TGax/D0.1” (“Stacey 0535”)	<ul style="list-style-type: none"> • Robert Stacey
RF-21	US 2017/0048048 (“Seok 048”)	<ul style="list-style-type: none"> • Yongho Seok
RF-22	US 2017/0202023 (“Zhou 023”)	<ul style="list-style-type: none"> • Yan Zhou • Simone Merlin • Gwendolyn Denise Barriac

No.	Patent No. or Title (Primary Inventor/Author)	Name of Person(s) from Whom Invention was Derived
		<ul style="list-style-type: none"> • Alfred Asterjadhi • George Cherian
RF-23	IEEE 802.11-16/1425r2 “Clarification on applying MU EDCA parameter set” (“Ahn 1425”)	<ul style="list-style-type: none"> • Minseok Noh
RF-24	US 2018/0034595 (“Kim 595”)	<ul style="list-style-type: none"> • Jeongki Kim • Kiseon Ryu • Hangyu Cho
RF-25	IEEE 802.11-16/0616r2 “Block Ack Generation and Selection Rules” (“Asterjadhi 0616”)	<ul style="list-style-type: none"> • Individuals identified as authors in Asterjadhi 0616 at pp. 1-8
RF-26	IEEE 802.11-16/1424r1 “Issue on the CWmax value in MU EDCA” (“Ahn 1424”)	<ul style="list-style-type: none"> • Minseok Noh
RF-27	IEEE P802.11ax/D1.0 (“802.11ax D1.0”)	<ul style="list-style-type: none"> • Members of Task Group ax

For example, Woojin Ahn – an inventor of the ’879 patent – regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, July 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Woojin Ahn was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Woojin Ahn derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the ’879 patent.

Further, for example, Juhyung Son – an inventor of the ’879 patent – regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX”

meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, May 2015, July 2015 September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Juhyung Son was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Juhyung Son derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '879 patent.

Further, for example, Geonjung Ko – an inventor of the '879 patent – regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, January 2015, May 2015, March 2015m, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Geonjung Ko was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Geonjung Ko derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '879 patent.

Further, for example, Jinsam Kwak – an inventor of the '879 patent – regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Jinsam Kwak was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Jinsam Kwak derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '879 patent.

Further, many of the inventors of the prior art references listed in Table 3-E above were members of Task Group AX. *See e.g.*, IEEE 802.11-16/0024r1 “Proposed TGax draft specification” (identifying as task group members, *e.g.*, Laurent Cariou, Robert Stacey, Simone Merlin, Jing Ma, Jeongki Kim, Kiseon Ryu, Hangyu Cho, Maarten Menzo Wentink, George Cherian, Alfred Asterjadhi, Gwendolyn Denise Barriac, Yongho Seok, who are authors/inventors of the prior art listed above in Table 3-F). Thus, by virtue of his attendance at the Task Group AX meetings, Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, and/or Jin Sam Kwak was aware of the subject matter of the prior art references listed in Table 3-F and that were discussed at those meetings, and derived this information in connection with filing a patent application that led to the '879 patent.

Moreover, the listed inventors Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, and/or Jin Sam Kwak frequently collaborated with other WILUS employees and Yonsei University employees, such as Minseok Noh, Jinsoo Ahn, Ronny Yongho Kim, Hanseul Hong, Kukil Lim, Jinho Lee, Young-Chai Ko, Yongho Seok *See e.g.*, IEEE 11-16-1425, "Clarification on applying MU EDCA parameter set," available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1425-02-00ax-clarification-on-applying-mu-edca-parameter-set.pptx>; IEEE 11-16-1424, "Issue on the CWmax value in MU EDCA," available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1424-02-00ax-issue-on-the-cwmax-value-in-mu-edca.pptx>; IEEE 11-14-0838, "Discussion on dual-link STR in IEEE 802.11ax," <https://mentor.ieee.org/802.11/dcn/14/11-14-0838-01-00ax-discussion-on-dual-link-str-in-ieee-802-11ax.pptx>; IEEE 11-16-8792, "Consideration on MU initial link setup," <https://mentor.ieee.org/802.11/dcn/16/11-16-8792-01-00ax-considerations-on-mu-initial-link-setup.pptx>; IEEE 11-16-0641, "Regarding HE fragmentation," <https://mentor.ieee.org/802.11/dcn/16/11-16-0641-02-00ax-regarding-he-fragmentation.pptx>; IEEE 11-16-0916, "TID value of ALL ACK signaling," <https://mentor.ieee.org/802.11/dcn/16/11-16-0917-01-00ax-text-for-tid-value-of-all-ack-signaling.docx>; IEEE 11-16-1426, "DL/UL indication in MU-RTS," <https://mentor.ieee.org/802.11/dcn/16/11-16-1426-00-00ax-dl-ul-indication-in-mu-rts.pptx>. By virtue of their collaborations, one or more of the listed inventors was aware of the claimed subject matter invented by these collaborators, and derived this information in connection with filing a patent application that led to the '879 patent. *See e.g.*, US 2017/0048048 ("Seok 048"); US 9,585,166 ("Seok 166").

To the extent that the '879 patent includes patentable subject matter with respect to any Asserted Claims, the '879 patent fails to name all inventors. As an example, the subject matter of one or more of the Asserted Claims of the '879 patent, at least as the claims are apparently being

interpreted by Wilus, was disclosed in IEEE 802.11-16/1425r2 “Clarification on applying MU EDCA parameter set” (“Ahn 1425) and IEEE 802.11-16/1424r1 “Issue on the CWmax value in MU EDCA” (“Ahn 1424”). These two prior art references were drafted by Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, Minseok Noh, Jin Sam Kwak. As demonstrated in the accompanying charts, Ahn 1424 and Ahn 1425 each discloses at least one claim element of the Asserted Claims of the ’879 patent. Ahn 1424 and Ahn 1425 each demonstrates that Minseok Noh is an inventor of the subject matter of the ’879 patent, despite not being listed as a named inventor thereon. *See* Ex. F23 & F26.

Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

7. U.S. Patent No. 11,129,163

The ’163 patent, including all asserted claims therein, are invalid on the grounds that the inventors of the ’163 patent derived their purported inventions from others. Table 3-G provides an identification, by the name of the person(s), from whom the purported invention was derived, and the circumstances of derivation are explained below.

Table 3-G: Prior Art under § 102 for the ’163 patent

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RG-1	US 2017/0223731 (“Lee 731”)	<ul style="list-style-type: none"> • Wookbong Lee • Kiseon Ryu • Jeongki Kim • Jinsoo Choi • HanGyu Cho
RG-2	WO 2016/021858 (“Lee 858”)	<ul style="list-style-type: none"> • Wookbong Lee • Kiseon Ryu • Jeongki Kim • Jinsoo Choi • HanGyu Cho

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RG-3	IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”)	<ul style="list-style-type: none"> • Individuals identified as authors in Stacey 0024 at pp. 1-5
RG-4	IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”)	<ul style="list-style-type: none"> • Geonjung Ko • Ju-Hyung Son • Minseok Noh • Jin Sam Kwak
RG-5	Evgeny Khorov et al., <i>IEEE 802.11ax: How to Build High Efficiency WLANs</i> , 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”)	<ul style="list-style-type: none"> • Engeny Khorov • Anton Kiryanov • Andrey Lyakhov
RG-6	US 2016/0249397 (“Seok 397”)	<ul style="list-style-type: none"> • Yongho Seok
RG-7	US 10,666,368 (“Barriac 368”)	<ul style="list-style-type: none"> • Gwendolyn Barriac • George Cherian • Simone Merlin • Alfred Asterjadhi • Yan Zhou • Gang Ding • Qungjian Tian
RG-8	US 10,321,485 (“Noh 485”)	<ul style="list-style-type: none"> • Yujin Noh • Young Hoon Kwon • Dae Won Lee • Sungho Moon
RG-9	US 2016/0345258 (“Zhou 258”)	<ul style="list-style-type: none"> • Yan Zhou • Gwendolyn Barriac • Simone Merlin • George Cherian
RG-10	US 2021/0243787 (“Oteri 787”)	<ul style="list-style-type: none"> • Oghenekome Oteri • Hanqing Lou • Frank La Sita • Fengjun Xi
RG-11	US 2017/0127352 (“Park ’352”)	<ul style="list-style-type: none"> • Giwon Park • Kiseon Ryu • Jeongki Kim • HanGyu Cho • Suhwook Kim
RG-12	US 2017/0188306 (“Park 306”)	<ul style="list-style-type: none"> • Giwon Park • Kiseon Ryu • Jeongki Kim • HanGyu Cho • Suhwook Kim
RG-13	US 2015/0124744 (“Zhu 744”)	<ul style="list-style-type: none"> • Hao Zhu

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
		<ul style="list-style-type: none"> • Simone Merlin • Chao Zou • Srinivas Katar • Hemanth Sampath • Gwendolyn Barriac
RG-14	WO 2017/031640 (“Du 640”)	<ul style="list-style-type: none"> • Zhenguo Du
RG-15	US 2017/0078887 (“Barriac 887”)	<ul style="list-style-type: none"> • Gwendolyn Barriac • George Cherian • Simone Merlin • Alfred Asterjadhi • Yan Zhou • Gang Ding • Qungjian Tian
RG-16	IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”)	<ul style="list-style-type: none"> • Geonjung Ko • Ju-Hyung Son • Minseok Noh • Jin Sam Kwak
RG-17	US 2016/0330663 (“Zhou 663”)	<ul style="list-style-type: none"> • Yan Zhou • Gwendolyn Barriac • Simone Merlin • George Cherian • Alfred Asterjadhi • Qingjian Tian • Gang Ding
RG-18	EP 2986066A (“Nelson 066”)	<ul style="list-style-type: none"> • George Nelson • James Proctor • John Hoffmann • Antoine Rouphael
RG-19	US 2019/082387 (“Kim 387”)	<ul style="list-style-type: none"> • Jeongki Kim • Kiseon Ryu • HanGyu Cho
RG-20	US 2016/330685 (“Asterjadhi 685”)	<ul style="list-style-type: none"> • Alfred Asterjadhi • Simone Merlin • George Cherian • Gwendolyn Barriac • Gang Ding • Yan Zhou
RG-21	US 2017/257817 (“Itagaki 817”)	<ul style="list-style-type: none"> • Takeshi Itagaki • Yuichi Morioka • Tomoya Yamaura
RG-22	IEEE Std 802.11ac (“802.11ac”)	<ul style="list-style-type: none"> • Various authors

Woojin Ahn—an inventor of the '163 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, July 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Woojin Ahn was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Woojin Ahn derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '163 patent.

Juhyung Son—an inventor of the '163 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, May 2015, July 2015 September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Juhyung Son was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Juhyung

Son derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '163 patent.

Geonjung Ko—an inventor of the '163 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Geonjung Ko was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Geonjung Ko derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '163 patent.

Jinsam Kwak—an inventor of the '163 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Jinsam Kwak was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus

contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Jinsam Kwak derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '163 patent.

Further, many of the inventors of the prior art references listed in Table 3-G above were members of Task Group AX. *See e.g.*, IEEE 802.11-16/0024r1 “Proposed TGax draft specification” (identifying as task group members, *e.g.*, Kiseon Ryu, Jeongki Kim, Jinsoo Choi, HanGyu Cho, Yongbo Seok, Gwendolyn Barriac, George Cherian, Simone Merlin, Alfred Asterjadhi, Yujin Noh, Young Hon Kwon, Dae Won Lee, Suhwook Kim, and Hemanth Sampath, who are authors/inventors of the prior art listed above in Table 3-G). Thus, by virtue of his attendance at the Task Group AX meetings, Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, and/or Jin Sam Kwak was aware of the subject matter of the prior art references listed in Table 3-G and that were discussed at those meetings, and derived this information in connection with filing a patent application that led to the '163 patent.

Moreover, the listed inventors Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, and/or Jin Sam Kwak frequently collaborated with other WILUS employees and Yonsei University employees, such as Minseok Noh, Jiho Lee, and Young-Chai Ko. *See, e.g.*, IEEE 802.11-16/0042r2, “BSS Color Settings for a Multiple BSSID Set,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-0042-02-00ax-bss-color-settings-for-a-multiple-bssid-set.pptx>; IEEE 802.11-16/0396r0, “Issues on BSS Color Bits Collision,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-0396-00-00ax-issues-on-bss-color-bits-collision.pptx>; IEEE 802.11-16/0640r3, “BSS Color Collision,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-0640-03-00ax-bss-color-collision.pptx>; IEEE 802.11-16/-918r0 “Discussions on Partial BSS Color,” available at

<https://mentor.ieee.org/802.11/dcn/16/11-16-0918-00-00ax-discussions-on-partial-bss-color.pptx>; IEEE 802.11-16/1236r0, “Text for Partial BSS Color and AID Assignment Rule,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1236-00-00ax-text-for-partial-bss-color-and-aid-assignment-rule.docx>. By virtue of their collaborations, one or more of the listed inventors was aware of the claimed subject matter invented by these collaborators.

To the extent that the ’163 patent includes patentable subject matter, the ’163 patent names an alleged inventor who did not invent the subject matter of the Asserted Claims. As an example, the subject matter of one or more of the Asserted Claims of the ’163 patent, at least as the claims are apparently being interpreted by Wilus, was disclosed in IEEE 802.11-16/0396r0 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) and IEEE 802.11-16/396r0 “Issues on BSS Color Collision” (“Ko 0396”). Ko 0042 and Ko 0396 were drafted by Geonjung Ko, Ju-Hyung Son, Minseok Noh, and Jin Sam Kwak. As demonstrated in the accompanying charts, Ko 0042 and Ko 0396 each disclose at least one claim element of the Asserted Claims of the ’163 patent. Ko 0042 and Ko 0396 each demonstrate that Minseok Noh is an inventor of the subject matter of the ’163 patent, despite not being listed as a named inventor. *See* RG4, RG16.

Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

8. U.S. Patent No. 11,700,597

The ’597 patent, including all asserted claims therein, are invalid on the grounds that the inventors of the ’597 patent derived their purported inventions from others. Table 3-H provides an identification, by the name of the person(s), from whom the purported invention was derived, and the circumstances of derivation are explained below.

Table 3-H: Prior Art under § 102 for the ’597 patent

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RH-1	US 2017/0223731 (“Lee 731”)	<ul style="list-style-type: none"> • Wookbong Lee • Kiseon Ryu • Jeongki Kim • Jinsoo Choi • HanGyu Cho
RH-2	WO 2016/021858 (“Lee 858”)	<ul style="list-style-type: none"> • Wookbong Lee • Kiseon Ryu • Jeongki Kim • Jinsoo Choi • HanGyu Cho
RH-3	IEEE P802.11 802.11-16/0024r1 “Proposed TGax draft specification” (“Stacey 0024”)	<ul style="list-style-type: none"> • Individuals identified as authors in Stacey 0024 at pp. 1-5
RH-4	IEEE 802.11-16/0042r2 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”)	<ul style="list-style-type: none"> • Geonjung Ko • Ju-Hyung Son • Minseok Noh • Jin Sam Kwak
RH-5	Evgeny Khorov et al., <i>IEEE 802.11ax: How to Build High Efficiency WLANs</i> , 2015 Int’l Conf. on Eng’g & Telecomm. 14-19 (2015) (“Khorov”)	<ul style="list-style-type: none"> • Engeny Khorov • Anton Kiryanov • Andrey Lyakhov
RH-6	US 2016/0249397 (“Seok 397”)	<ul style="list-style-type: none"> • Yongho Seok
RH-7	US 10,666,368 (“Barriac 368”)	<ul style="list-style-type: none"> • Gwendolyn Barriac • George Cherian • Simone Merlin • Alfred Asterjadhi • Yan Zhou • Gang Ding • Qungjian Tian
RH-8	US 10,321,485 (“Noh 485”)	<ul style="list-style-type: none"> • Yujin Noh • Young Hoon Kwon • Dae Won Lee • Sungho Moon
RH-9	US 2016/0345258 (“Zhou 258”)	<ul style="list-style-type: none"> • Yan Zhou • Gwendolyn Barriac • Simone Merlin • George Cherian
RH-10	US 2021/0243787 (“Oteri 787”)	<ul style="list-style-type: none"> • Oghenekome Oteri • Hanqing Lou • Frank La Sita • Fengjun Xi
RH-11	US 2017/0127352 (“Park ’352”)	<ul style="list-style-type: none"> • Giwon Park

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
		<ul style="list-style-type: none"> • Kiseon Ryu • Jeongki Kim • HanGyu Cho • Suhwook Kim
RH-12	US 2017/0188306 (“Park 306”)	<ul style="list-style-type: none"> • Giwon Park • Kiseon Ryu • Jeongki Kim • HanGyu Cho • Suhwook Kim
RH-13	US 2015/0124744 (“Zhu 744”)	<ul style="list-style-type: none"> • Hao Zhu • Simone Merlin • Chao Zou • Srinivas Katar • Hemanth Sampath • Gwendolyn Barriac
RH-14	WO 2017/031640 (“Du 640”)	<ul style="list-style-type: none"> • Zhenguo Du
RH-15	US 2017/0078887 (“Barriac 887”)	<ul style="list-style-type: none"> • Gwendolyn Barriac • George Cherian • Simone Merlin • Alfred Asterjadhi • Yan Zhou • Gang Ding • Qungjian Tian
RH-16	IEEE 802.11-16/0396r0 “Issues on BSS Color Collision” (“Ko 0396”)	<ul style="list-style-type: none"> • Geonjung Ko • Ju-Hyung Son • Minseok Noh • Jin Sam Kwak
RH-17	US 2016/0330663 (“Zhou 663”)	<ul style="list-style-type: none"> • Yan Zhou • Gwendolyn Barriac • Simone Merlin • George Cherian • Alfred Asterjadhi • Qingjian Tian • Gang Ding
RH-18	EP 2986066A (“Nelson 066”)	<ul style="list-style-type: none"> • George Nelson • James Proctor • John Hoffmann • Antoine Rouphael
RH-19	US 2019/082387 (“Kim 387”)	<ul style="list-style-type: none"> • Jeongki Kim • Kiseon Ryu • HanGyu Cho

Ex.	Prior Art Disclosing Technical Features	Name of Person(s) from Whom Invention was Derived
RH-20	US 2016/330685 (“Asterjadhi 685”)	<ul style="list-style-type: none"> • Alfred Asterjadhi • Simone Merlin • George Cherian • Gwendolyn Barriac • Gang Ding • Yan Zhou
RH-21	US 2017/257817 (“Itagaki 817”)	<ul style="list-style-type: none"> • Takeshi Itagaki • Yuichi Morioka • Tomoya Yamaura
RH-22	IEEE 802.11ac (“802.11ac”)	<ul style="list-style-type: none"> • Various authors

For example, Woojin Ahn—an inventor of the ’597 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, July 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Woojin Ahn was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Woojin Ahn derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the ’597 patent.

Further, for example, Juhyung Son—an inventor of the ’597 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May 2015, March 2015, May 2015, July 2015 September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May

2017, July 2017, and September 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Juhyung Son was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Juhyung Son derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '597 patent.

Further, for example, Geonjung Ko—an inventor of the '597 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, January 2015, May 2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Geonjung Ko was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Geonjung Ko derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '597 patent.

Further, for example, Jinsam Kwak—an inventor of the '597 patent—regularly attended IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group and/or “Task Group AX” meetings, including at least the meeting in September 2014, November 2014, January 2015, May

2015, March 2015, September 2015, November 2015, January 2016, March 2016, May 2016, July 2016, September 2016, November 2016, January 2017, March 2017, May 2017, July 2017. *See* IEEE Status of Project IEEE 802.11ax High Efficiency (HE) Wireless LAN Task Group, available at https://www.ieee802.org/11/Reports/tgax_update.htm. By virtue of his attendance at those meetings, Jinsam Kwak was aware of the draft and final specifications for 802.11ax being considered and voted upon at those meetings, including technical submissions by non-Wilus contributors, IEEE 802.11 vD0.1, D1.0, and D2.0 as well as prior drafts of it. Jinsam Kwak derived the information learned at those meetings and from the related documents in connection with filing a patent application that led to the '597 patent.

Further, many of the inventors of the prior art references listed in Table 3-H above were members of Task Group AX. *See e.g.*, IEEE 802.11-16/0024r1 “Proposed TGax draft specification” (identifying as task group members, *e.g.*, Kiseon Ryu, Jeongki Kim, Jinsoo Choi, HanGyu Cho, Yongbo Seok, Gwendolyn Barriac, George Cherian, Simone Merlin, Alfred Asterjadhi, Yujin Noh, Young Hon Kwon, Dae Won Lee, Suhwook Kim, and Hemanth Sampath, who are authors/inventors of the prior art listed above in Table 3-H). Thus, by virtue of his attendance at the Task Group AX meetings, Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, and/or Jin Sam Kwak was aware of the subject matter of the prior art references listed in Table 3-H and that were discussed at those meetings, and derived this information in connection with filing a patent application that led to the '597 patent.

Moreover, the listed inventors Woojin Ahn, John (Ju-Hyung) Son, Geonjung Ko, and/or Jin Sam Kwak frequently collaborated with other WILUS employees and Yonsei University employees, such as Minseok Noh, Jiho Lee, and Young-Chai Ko. *See, e.g.*, IEEE 802.11-16/0042r2, “BSS Color Settings for a Multiple BSSID Set,” available at

<https://mentor.ieee.org/802.11/dcn/16/11-16-0042-02-00ax-bss-color-settings-for-a-multiple-bssid-set.pptx>; IEEE 802.11-16/0396r0, “Issues on BSS Color Bits Collision,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-0396-00-00ax-issues-on-bss-color-bits-collision.pptx>; IEEE 802.11-16/0640r3, “BSS Color Collision,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-0640-03-00ax-bss-color-collision.pptx>; IEEE 802.11-16/-918r0 “Discussions on Partial BSS Color,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-0918-00-00ax-discussions-on-partial-bss-color.pptx>; IEEE 802.11-16/1236r0, “Text for Partial BSS Color and AID Assignment Rule,” available at <https://mentor.ieee.org/802.11/dcn/16/11-16-1236-00-00ax-text-for-partial-bss-color-and-aid-assignment-rule.docx>. By virtue of their collaborations, one or more of the listed inventors was aware of the claimed subject matter invented by these collaborators.

To the extent that the ’597 patent includes patentable subject matter, the ’597 patent names an alleged inventor who did not invent the subject matter of the Asserted Claims. As an example, the subject matter of one or more of the Asserted Claims of the ’597 patent, at least as the claims are apparently being interpreted by Wilus, was disclosed in IEEE 802.11-16/0396r0 “BSS Color Settings for a Multiple BSSID Set” (“Ko 0042”) and IEEE 802.11-16/396r0 “Issues on BSS Color Collision” (“Ko 0396”). Ko 0042 and Ko 0396 were drafted by Geonjung Ko, Ju-Hyung Son, Minseok Noh, and Jin Sam Kwak. As demonstrated in the accompanying charts, Ko 0042 and Ko 0396 each disclose at least one claim element of the Asserted Claims of the ’597 patent. Ko 0042 and Ko 0396 each demonstrate that Minseok Noh is an inventor of the subject matter of the ’597 patent, despite not being listed as a named inventor. *See* RH4, RH16.

Defendants reserve the right to amend, modify, or supplement these Invalidity Contentions should additional information become available to them through discovery.

V. P.R. 3-3(c) – Claim Charts

Pursuant to Rule 3-3(d), Defendants identify invalidity claim charts identifying disclosures in the references identified in Section III supra as to the Asserted Claims of the Asserted Patents are provided in attached Exhibits A-01-A-08 & Appendix A ('077 patent), Exhibits B-01-B-08 & Appendix B ('210 patent), Exhibits C-01-13 & Appendix C ('281 patent), Exhibits D-01-16 & Appendix D ('595 patent), Exhibits E-01-E-27 & Appendix E ('035 patent), Exhibits F-01-F-27 & Appendix F ('879 patent), Exhibits G-01-G-24 & Appendix G ('163 patent), and Exhibits H-01-H-24 & Appendix H ('597 patent). Furthermore, Defendants identify obviousness combinations on a claim-by-claim basis for each of the Asserted Patents in Attachment A.

Defendants have identified relevant portions and/or features of the prior art. However, the identified prior art may contain additional descriptions of or alternative support for the claim limitations. Defendants may rely on uncited portions or features of the identified prior art, other documents, and expert testimony, to provide context or to aid in understanding the identified prior art and the state of the art. Citations to a particular figure in a reference include the caption and description of the figure and any text relating to the figure. Similarly, citations to particular text referring to a figure include the figure and caption as well. Portions relevant to dependent claims incorporate by reference the citations to the chain of claims from which that dependent claim derives. Likewise, portions related to subsequent limitations that refer to claim elements identified, described, and/or cited to in earlier limitations may rely on the citations related to those portions of the claim chart that identify and/or describe these elements.

Throughout the invalidity claim charts in Exhibits & Appendices A-H, Defendants provide examples of where references disclose subject matter recited in preambles of the Asserted Claims, regardless whether the preambles limit the claims. Defendants reserve the right to argue that the preambles are or are not limitations. Further, where an entry in a claim chart corresponding to a

given limitation refers back to the discussion of another claim, the entry incorporates all evidence cited for the other claim.

VI. P.R. 3-3(d) – Other Grounds For Invalidity

A. U.S. Patent No. 10,313,077

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '077 patent based on lack of written description under 35 U.S.C. § 112 (a); lack of enablement under 35 U.S.C. § 112 (a); indefiniteness under 35 U.S.C. § 112 (b); and indefiniteness under 35 U.S.C. § 112 (f). These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '077 patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112 (a)

The '077 patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '077 patent Asserted Claims at the time the '077 patent was filed. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that “reasonably conveys to those skilled in the art that the inventor had possession of the

claimed subject matter as of the filing date.” *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods.

The specification of the ’077 patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the ’077 patent Asserted Claims without undue experimentation. To the extent the following limitations are definite (under 35 U.S.C. § 112 (b)), the application that became the ’077 patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112 (a):³⁵

Term	Relevant Claim(s)
“obtain length information indicating information on a duration of the non-legacy physical layer frame, from the legacy signaling field” / “obtaining length information indicating information on a duration of the non-legacy physical layer frame after a legacy signaling field, from the legacy signaling field”	1, 8
“obtain[ing] information other than [the] information on the duration of the non-legacy physical layer frame through a remaining value obtained by dividing the length information by a data size transmittable by a symbol of a legacy physical layer frame, wherein the data size transmittable by a symbol of the legacy physical layer frame is 3 octets when a data rate of the legacy physical layer frame is 3 Mbps and 6 octets when a data rate of the legacy physical layer frame is 6 Mbps”	1, 8
<p>“determine the number of symbols of data of the non-legacy physical layer frame according to a following equation,</p> $N_{SYM} = \left\lfloor \left(\frac{L_LENGTH + m + 3}{3} \times 4 - T_{HE_PREMABLE} \right) / T_{SYM} \right\rfloor - b_{PE_Disambiguity}$ <p>where $\lfloor x \rfloor$ denotes a largest integer less than or equal to x, L_LENGTH denotes the length information, m denotes a value obtained by subtracting the remaining value from the data size transmittable by a symbol of the legacy physical layer frame, $b_{PE_Disambiguity}$ denotes a value of PE Disambiguity field, $T_{HE_PREMABLE}$ denotes a duration of non-legacy preamble of the non-legacy physical layer frame, T_{SYM} denotes a duration of a symbol of the data of the non-legacy physical layer frame”</p>	1

³⁵ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
<p>“determining the number of symbols of the data of the non-legacy physical layer frame according to a following equation,</p> $N_{SYM} = \left\lfloor \left(\frac{L_LENGTH + m + 3}{3} \times 4 - T_{HE_PREMABLE} \right) / T_{SYM} \right\rfloor - b_{PE_Disambiguity}$ <p>where [x] denotes a largest integer less than or equal to x, L_LENGTH denotes the length information, m denotes a value obtained by subtracting the remaining value from the data size transmittable by a symbol of the legacy physical layer frame, b_{PE_Disambiguity} denotes a value of PE Disambiguity field, T_{HE_PREMABLE} denotes a duration of non-legacy preamble of the non-legacy physical layer frame, T_{SYM} denotes a duration of a symbol of the data of the non-legacy physical layer frame,”</p>	8
<p>“m denotes a value obtained by subtracting the remaining value from the data size transmittable by a symbol of the legacy physical layer frame”</p>	1, 2, 8, 9
<p>“wherein the PE Disambiguity field is set based on the duration of a symbol of the data of the non-legacy physical layer frame and an increment of duration to set a value of the length information based on a duration of a symbol of [the] legacy physical layer frame”</p>	1, 8
<p>“The wireless communication terminal of claim 1, wherein the processor is configured to obtain a duration of a packet extension which is a padding of the non-legacy physical layer frame, according to a following equation,</p> $T_{PE} = \left\lfloor \frac{\left(\frac{L_LENGTH + m + 3}{3} \times 4 - T_{HE_PREMABLE} \right) - N_{SYM} \times T_{SYM}}{4} \right\rfloor \times 4$ <p>where [x] denotes a largest integer less than or equal to x, L_LENGTH denotes the length information, m denotes the value obtained by subtracting the remaining value from the data size transmittable by a symbol of the legacy physical layer frame, T_{HE_PREMABLE} denotes the duration of non-legacy preamble of the non-legacy physical layer frame, T_{SYM} denotes the duration of a symbol of the data of the non-legacy physical layer frame.”</p>	2
<p>“obtaining a duration of a packet extension which is a padding of the non-legacy physical layer frame, according to a following equation,</p> $T_{PE} = \left\lfloor \frac{\left(\frac{L_LENGTH + m + 3}{3} \times 4 - T_{HE_PREMABLE} \right) - N_{SYM} \times T_{SYM}}{4} \right\rfloor \times 4$	9

Term	Relevant Claim(s)
where [x] denotes a largest integer less than or equal to x, L_LENGTH denotes the length information, m denotes the value obtained by subtracting the remaining value from the data size transmittable by a symbol of the legacy physical layer frame, T _{HE_PREAMBLE} denotes the duration of non-legacy preamble of the non-legacy physical layer frame, T _{SYM} denotes the duration of a symbol of the data of the non-legacy physical layer frame.”	
“wherein the increment of duration is a value obtained by multiplying a difference between a value obtained by performing a ceiling operation on a value obtained by dividing the duration of the non-legacy physical layer frame after the legacy signaling field by the duration of a symbol of the legacy physical layer frame and the value obtained by dividing the duration of the non-legacy physical layer frame after the legacy signaling field by the duration of a symbol of the legacy physical layer frame by the duration of a symbol of the legacy physical layer frame.”	3, 10
“determin[e] whether the non-legacy physical layer frame comprises a predetermined signaling field based on the length information”	5, 12
“obtain[\ing] the information other than the information on the duration of the non-legacy physical layer frame based on the remaining value and a modulation method of a third symbol after the legacy signaling field”	6, 13

2. Indefiniteness Under 35 U.S.C. § 112 (b)

Under § 112 (b), “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” *Id.* A patent is indefinite under § 112 (b) “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the ’077 patent Asserted Claims are invalid because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite under § 112 (a), for failing to particularly point out and distinctly claim the subject matter the applicants regard as their invention.

The following limitations recited in the '077 patent Asserted Claims are indefinite in whole, in part or in combination:³⁶

Term	Relevant Claim(s)
“obtain[\ing] information other than [the] information on the duration of the non-legacy physical layer frame through a remaining value obtained by dividing the length information by a data size transmittable by a symbol of a legacy physical layer frame”	1, 8
“wherein the data size transmittable by a symbol of the legacy physical layer frame is 3 octets when a data rate of the legacy physical layer frame is 6 Mbps”	1, 8
“bPE_Disambiguity denotes a value of PE Disambiguity field” / “wherein the PE Disambiguity field is set based on the duration of a symbol of the data of the non-legacy physical layer frame and an increment of duration to set a value of the length information based on a duration of a symbol of [the] legacy physical layer frame.”	1, 8
“a symbol of the legacy physical layer frame”	1-3, 8-10
“determin[e\ing] whether the non-legacy physical layer frame comprises a predetermined signaling field based on the length information”	5, 12
“obtain[\ing] the information other than the information on the duration of the non-legacy physical layer frame based on the remaining value and a modulation method of a third symbol after the legacy signaling field”	6, 13

Furthermore, Section 112 (f) allows a patentee to express a claim element “as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.” 35 U.S.C. § 112, ¶ 6. For such claims, the written description of the patent must disclose with sufficient particularity the corresponding structure for performing the claimed function, and it must clearly link that structure to the claimed function. *Ibormeith IP, LLC v. Mercedes-Benz USA, LLC*, 732 F.3d 1376, 1379 (Fed. Cir. 2013). Several of the '077 patent Asserted Claims are invalid as indefinite because they contain means-plus-function terms subject to Section 112 (f),

³⁶ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

and the '077 patent fails to disclose with sufficient particularity the corresponding structure for performing the claimed function.

The following limitations recited in the '077 patent Asserted Claims are governed by Section 112 (f) and are indefinite in whole, in part or in combination:³⁷

Term	Relevant Claim(s)
<p>“wherein the processor is configured to receive a non-legacy physical layer frame by using the transceiver, obtain a legacy signaling field including information decodable by a legacy wireless communication terminal from the non-legacy physical layer frame, obtain length information indicating information on a duration of the non-legacy physical layer frame, from the legacy signaling field, obtain information other than information on the duration of the non-legacy physical layer frame through a remaining value obtained by dividing the length information by a data size transmittable by a symbol of a legacy physical layer frame, wherein the data size transmittable by a symbol of the legacy physical layer frame is 3 octets when a data rate of the legacy physical layer frame is 6 Mbps, and determine the number of symbols of data of the non-legacy physical layer frame according to a following equation,</p> $N_{SYM} = \left\lfloor \left(\frac{L_LENGTH + m + 3}{3} \times 4 - T_{HE_PREMABLE} \right) / T_{SYM} \right\rfloor - b_{PE_Disambiguity}$ <p>where $\lfloor x \rfloor$ denotes a largest integer less than or equal to x, L_LENGTH denotes the length information, m denotes a value obtained by subtracting the remaining value from the data size transmittable by a symbol of the legacy physical layer frame, $b_{PE_Disambiguity}$ denotes a value of PE Disambiguity field, $T_{HE_PREMABLE}$ denotes a duration of non-legacy preamble of the non-legacy physical layer frame, T_{SYM} denotes a duration of a symbol of the data of the non-legacy physical layer frame, wherein the PE Disambiguity field is set based on the duration of a symbol of the data of the non-legacy physical layer frame and an increment of duration to set a value of the length information based on a duration of a symbol of the legacy physical layer frame.</p>	<p>1-7</p>

³⁷ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

3. Invalidation Under 35 U.S.C. § 101

Pursuant to the Court’s Standing Order, Defendants contend that the ’077 patent’s Asserted Claims are invalid under 35 U.S.C. § 101 because the claims are not directed to patent-eligible subject matter. Defendants’ contentions that the Asserted Claims are invalid under 35 U.S.C. § 101 do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Claims, or that any of the claims of the ’077 patent are not anticipated or rendered obvious by prior art.

35 U.S.C. § 101 provides that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor[.]” Because abstract ideas form the “basic tools of scientific and technological work,” they are unpatentable subject matter under 35 U.S.C. § 101. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014). “The Supreme Court provided a two-part test for assessing patent eligibility under Section 101.” *Certain Elec. Devices, Including Streaming Players, Televisions, Set Top Boxes, Remote Controllers, & Components Thereof*, Inv. No. 337-TA-1200, Order No. 21, 2020 WL 6441422 at *4 (Sept. 14, 2020).

Under the first step of *Alice* (“Step One”), a court must decide whether the claims are directed to ineligible subject matter, such as an abstract idea. *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1326 (Fed. Cir. 2017); *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015). To do so, a court examines the claims to determine whether their “character as a whole,” or their “focus,” is an abstract idea. *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016). This examination entails “identify[ing] and defin[ing] whatever fundamental concept appears wrapped up” in the claims. *Accenture Glob. Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1341 (Fed. Cir. 2013) (internal quotation marks and citations omitted). Once ascertained, the court then determines whether that character is “directed

to excluded subject matter,” such as an abstract idea. *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016) (internal citation omitted). This inquiry often asks whether the claims’ character is directed to “a specific means or method” for improving technology or whether it is simply directed to an abstract end-result. *RecogniCorp*, 855 F.3d at 1326. If the claims are not directed to an abstract idea, the inquiry ends. *Thales Visionix Inc. v. United States*, 850 F.3d 1343, 1349 (Fed. Cir. 2017). To resolve this question, “it is often helpful to ask whether the claims are directed to ‘an improvement in the functioning of a computer,’ or merely ‘adding conventional computer components to well-known business practices.’” *Affinity Labs. of Texas, LLC v. Amazon.com Inc.*, 838 F.3d 1266, 1270 (Fed. Cir. 2016) (quoting *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1338 (Fed. Cir. 2016)). “Generalized steps to be performed on a computer using conventional computer activity are abstract[.]” *RecogniCorp*, 855 F.3d at 1326 (internal quotation marks omitted). And “[c]laims directed to generalized steps to be performed on a computer using conventional computer activity are not patent eligible.” *Affinity Labs.*, 838 F.3d at 1270 (citing *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1348-49 (Fed. Cir. 2015)).

If the claims, as here, are directed to one or more abstract ideas, then the court advances to the second step of *Alice* (“Step Two”), where the claim elements must be scrutinized “both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Enfish*, 822 F.3d at 1354 (quoting *Alice*, 573 U.S. at 217). At Step Two, the court searches for an “‘inventive concept’ sufficient to ‘transform the nature of the claim into a patent-eligible application.’” *RecogniCorp*, 855 F.3d at 1327 (quoting *Alice*, 573 U.S. at 217). To save a patent at Step Two, an inventive concept must be evident in the claims. *See Alice*, 573 U.S. at 221; *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016). The “inventive concept” must also “involve

more than performance of well-understood, routine, and conventional activities previously known to the industry.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 73 (2012); *Certain Elec. Devices*, 2020 WL 6441422 at *4. The Federal Circuit’s “precedent is clear that merely adding computer functionality to increase the speed or efficiency of the process does not confer patent eligibility on an otherwise abstract idea.” *Ericsson Inc. v. TCL Commc’n Tech. Holdings Ltd.*, 955 F.3d 1317, 1330 (Fed. Cir. 2020) (citing *Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1370 (Fed. Cir. 2015)). In addition, limitations that simply restrict the invention to a single field of use or merely add “token post-solution” requirements also fail to impart patentability. *Bilski v. Kappos*, 561 U.S. 593, 612 (2010).

All Asserted Claims of the ’077 patent are invalid under 35 U.S.C. § 101 because they fail to claim patent-eligible subject matter. The Asserted Claims are directed to the abstract idea of determining an amount of received data.. The Asserted Claims, however, fail to describe anything beyond the abstract idea of determining an amount of received data.. None of the remaining claim elements, considered individually or as an ordered combination, transform the nature of the claims into patent-eligible subject matter. To the extent structure is claimed in any of the claims, that structure is nothing more than general purpose computer components performing general purpose computer functions. Such general purpose structure is insufficient to transform the nature of the claims into patent-eligible subject matter.

Further detail regarding Samsung’s contentions that the Asserted Claims of the ’077 patent do not qualify as patent-eligible subject matter are contained in Exhibit A101. Specifically, pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit A101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual

and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit A101, each Challenged Claim of the '077 patent is directed to an abstract idea and therefore is not directed to patent eligible subject matter. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit A101, which references and incorporates information from Exhibits A-01-A-08, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Samsung provides the following description of the relevant industry at the relevant time. As of the alleged priority date for the '077 patent (June 29, 2015), the relevant industry was well-developed. Wireless telecommunications had been around for decades. Further, all individual elements disclosed and recited in the '077 patent were conventional, routine, and well-known in the industry. *See generally* Exhibits A-01-A-08, Appendix A. By way of example, the need for coexistence among legacy and non-legacy wireless communication terminals was known. *See, e.g.*, Exhibits A-01-A-08, A101 at [1pre], Appendix A. Conventional components such as transceivers and processors were known, as were non-legacy physical layer frames. *See, e.g.*, Exhibits A-01-A-08, A101 at [1a]-[1c]. It was also known that a non-legacy physical layer frame could include a legacy signaling field, and that the number of symbols of data of the non-legacy physical layer frame could be determined. *See, e.g.*, Exhibits A-01-A-08, A101 at [1d]-[1f], Appendix A. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the '077 patent. Instead, these concepts had been known for years and were the subject of many

published articles and/or patents from around the world. The '077 patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

B. U.S. Patent No. 11,159,210

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '210 patent based on lack of written description under 35 U.S.C. § 112 (a); lack of enablement under 35 U.S.C. § 112 (a); and indefiniteness under 35 U.S.C. § 112 (b). These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '210 patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112 (a)

The '210 patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '210 patent Asserted Claims at the time the '210 patent was filed. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that “reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.* One of ordinary skill in the art would not have

understood that the inventors were in possession of the full scope of the claimed apparatus and methods.

The specification of the '210 patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '210 patent Asserted Claims without undue experimentation. To the extent the following limitations are definite (under 35 U.S.C. § 112 (b)), the application that became the '210 patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112 (a):³⁸

Term	Relevant Claim(s)
“wherein when a SIG-B compression field of the HE-SIG-A indicates full bandwidth multi User-Multiple Input Multiple Output (MU-MIMO) transmission, a format of user field(s) included in a user specific field of the HE-SIG-B is identified based on a number of MU-MIMO users indicated by a subfield of the HE-SIG-A”	1, 6
“wherein when the number of MU-MIMO users indicates two or more users, the user specific field of the HE-SIG-B includes user fields for MU-MIMO allocation, and wherein when the number of MU-MIMO users indicates a single user, the user specific field of the HE-SIG-B includes one user field for non-MU-MIMO allocation”	1, 6
“wherein when the number of MU-MIMO users indicates a single user”	1, 6
“the number of MU-MIMO users is indicated by a number of HE-SIG-B symbols field in the HE-SIG-A”	4, 9
“specific subfield”	5
“the SIG-B compression field indicates whether full bandwidth MU-MIMO transmission is used”	5
“when the SIG-B compression field indicates full bandwidth MU-MIMO transmission, the specific subfield indicates the number of MU-MIMO users”	5

³⁸ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

2. Indefiniteness Under 35 U.S.C. § 112 (b)

Under § 112 (b), “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” *Id.* A patent is indefinite under § 112 (b) “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the ’210 patent Asserted Claims are invalid because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite under § 112 (a), for failing to particularly point out and distinctly claim the subject matter the applicants regard as their invention.

The following limitations recited in the ’210 patent Asserted Claims are indefinite in whole, in part or in combination:³⁹

Term	Relevant Claim(s)
“wherein when a SIG-B compression field of the HE-SIG-A indicates full bandwidth multi User-Multiple Input Multiple Output (MU-MIMO) transmission, a format of user field(s) included in a user specific field of the HE-SIG-B is identified based on a number of MU-MIMO users indicated by a subfield of the HE-SIG-A”	1, 6
“wherein when the number of MU-MIMO users indicates two or more users, the user specific field of the HE-SIG-B includes user fields for MU-MIMO allocation, and wherein when the number of MU-MIMO users indicates a single user, the user specific field of the HE-SIG-B includes one user field for non-MU-MIMO allocation”	1, 6
“wherein when the number of MU-MIMO users indicates a single user”	1, 6
“the number of MU-MIMO users is indicated by a number of HE-SIG-B symbols field in the HE-SIG-A”	4, 9
“the SIG-B compression field indicates whether full bandwidth MU-MIMO transmission is used”	5

³⁹ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
“when the SIG-B compression field indicates full bandwidth MU-MIMO transmission, the specific subfield indicates the number of MU-MIMO users”	5

Furthermore, Section 112 (f) allows a patentee to express a claim element “as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.” 35 U.S.C. § 112, ¶ 6. For such claims, the written description of the patent must disclose with sufficient particularity the corresponding structure for performing the claimed function, and it must clearly link that structure to the claimed function. *Ibormeith IP, LLC v. Mercedes-Benz USA, LLC*, 732 F.3d 1376, 1379 (Fed. Cir. 2013). Several of the ’210 patent Asserted Claims are invalid as indefinite because they contain means-plus-function terms subject to Section 112 (f), and the ’210 patent fails to disclose with sufficient particularity the corresponding structure for performing the claimed function.

The following limitations recited in the ’210 patent Asserted Claims are governed by Section 112 (f) and are indefinite in whole, in part or in combination:⁴⁰

Term	Relevant Claim(s)
“a communication unit”	1-5
“a processor configured to process signals transmitted and received through the communication unit, ...”	1-5

3. Invalidity Under 35 U.S.C. § 101

Pursuant to the Court’s Standing Order, Defendants contend that the ’210 patent’s Asserted Claims are invalid under 35 U.S.C. § 101 because the claims are not directed to patent-eligible subject matter. Defendants’ contentions that the Asserted Claims are invalid under 35 U.S.C. §

⁴⁰ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

101 do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Claims, or that any of the claims of the '210 patent are not anticipated or rendered obvious by prior art.

All Asserted Claims of the '210 patent are invalid under 35 U.S.C. § 101 because they fail to claim patent-eligible subject matter. The Asserted Claims are directed to the abstract idea of extracting data. The Asserted Claims, however, fail to describe anything beyond the abstract idea of extracting data. None of the remaining claim elements, considered individually or as an ordered combination, transform the nature of the claims into patent-eligible subject matter. To the extent structure is claimed in any of the claims, that structure is nothing more than general purpose computer components performing general purpose computer functions. Such general purpose structure is insufficient to transform the nature of the claims into patent-eligible subject matter.

Further detail regarding Samsung's contentions that the Asserted Claims of the '210 patent do not qualify as patent-eligible subject matter are contained in Exhibit B101. Specifically, pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit B101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit B101, each Challenged Claim of the '210 patent is directed to an abstract idea and therefore is not directed to patent eligible subject matter. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit B101, which references and incorporates information from Exhibits B01-B08, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the

relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Samsung provides the following description of the relevant industry at the relevant time. As of the alleged priority date for the '210 patent (January 9, 2017), the relevant industry was well-developed. Wireless telecommunications had been around for decades. Further, all individual elements disclosed and recited in the '210 patent were conventional, routine, and well-known in the industry. *See generally* Exhibits B01-B08, Appendix B. By way of example, the need for signaling for MU-MIMO transmissions was known. *See, e.g.*, Exhibits B01-B08, B101 at [1pre], Appendix B. Communication units and processors configured to process signals transmitted and received through the communication unit were also known. *See, e.g.*, Exhibits B01-B08, B101 at [1a]–[1c], Appendix B. It was also known to use the preamble of a data unit, which contains certain fields, in order to signal various things—including a multi-user packet. *See, e.g.*, Exhibits B01-B08, B101 at [1d]–[1h], Appendix B. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the '210 patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '210 patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

C. U.S. Patent No. 10,687,281

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '281 patent based on lack of written description under 35 U.S.C. § 112 (a); lack of enablement under 35 U.S.C. § 112 (a); indefiniteness under 35 U.S.C. § 112 (b); and indefiniteness under 35 U.S.C. § 112 (f). These contentions shall not be construed as an admission that any claim construction

advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '281 patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112 (a)

The '281 patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '281 patent Asserted Claims at the time the '281 patent was filed. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a "manner that reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods.

The specification of the '281 patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '281 patent Asserted Claims without undue experimentation. To the extent the following limitations are definite (under 35 U.S.C. § 112 (b)),

the application that became the '281 patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112 (a):⁴¹

Term	Relevant Claim(s)
a communication unit / receive a wireless packet through the communication unit	1-6
[obtain/obtaining] bandwidth information indicated via a bandwidth field of HE-SIG-A of the received packet,	1-6, 8-13
[obtain/obtaining] information of an unassigned resource unit via at least one of the bandwidth field of the HE-SIG-A and a subfield of HE-SIG-B of the received packet, and	1-6, 8-13
[decode/decoding] the received packet based on the bandwidth information and the information of the unassigned resource unit,	1-6, 8-13
wherein the information of the unassigned resource unit is indicated via a combination of the bandwidth field of the HE-SIG-A and a resource unit allocation field of the HE-SIG-B, and	1-6, 8-13
wherein the bandwidth field of the HE-SIG-A indicates channel information to be punctured within the bandwidth, and the resource unit allocation field indicates additional puncturing information for the unassigned resource unit within the bandwidth	1-6, 8-13
wherein the resource unit allocation field indicates a specific resource unit not assigned to a user through a predetermined index	2, 9
wherein the specific resource unit not assigned to a user is at least one of a 242-tone resource unit, a 484-tone resource unit, and a 996-tone resource unit	3, 10
wherein the information of the unassigned resource unit is obtained through resource unit arrangement information indicated by the resource unit allocation field of the HE-SIG-B and a Null STA ID contained in a user field corresponding to a specific resource unit in the resource unit arrangement	4, 11
wherein the specific resource unit is at least one of a 26-tone resource unit, a 52-tone resource unit, and a 106-tone resource unit	5, 12
wherein when the bandwidth field indicates puncturing of one of two 20 MHz channels in a secondary 40 MHz channel within a bandwidth of 80 MHz or puncturing of at least one of two 20 MHz channels in a secondary 40 MHz channel within a bandwidth of 160 MHz or 80+80 MHz, the resource unit allocation field indicates which 20 MHz channel in the secondary 40 MHz channel is punctured	6, 13

⁴¹ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

2. Indefiniteness Under 35 U.S.C. § 112 (b)

Under § 112 (b), “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” *Id.* A patent is indefinite under § 112 (b) “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the ’281 patent Asserted Claims are invalid because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite under § 112 (a), for failing to particularly point out and distinctly claim the subject matter the applicants regard as their invention.

The following limitations recited in the ’281 patent Asserted Claims are indefinite in whole, in part or in combination:⁴²

Term	Relevant Claim(s)
a communication unit / receive a wireless packet through the communication unit	1-6
[obtain/obtaining] bandwidth information indicated via a bandwidth field of HE-SIG-A of the received packet,	1-6, 8-13
[obtain/obtaining] information of an unassigned resource unit via at least one of the bandwidth field of the HE-SIG-A and a subfield of HE-SIG-B of the received packet, and	1-6, 8-13
[decode/decoding] the received packet based on the bandwidth information and the information of the unassigned resource unit,	1-6, 8-13
wherein the information of the unassigned resource unit is indicated via a combination of the bandwidth field of the HE-SIG-A and a resource unit allocation field of the HE-SIG-B, and	1-6, 8-13
wherein the bandwidth field of the HE-SIG-A indicates channel information to be punctured within the bandwidth, and the resource unit allocation field indicates additional puncturing information for the unassigned resource unit within the bandwidth	1-6, 8-13

⁴² Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
wherein the resource unit allocation field indicates a specific resource unit not assigned to a user through a predetermined index	2, 9
wherein the specific resource unit not assigned to a user is at least one of a 242-tone resource unit, a 484-tone resource unit, and a 996-tone resource unit	3, 10
wherein the information of the unassigned resource unit is obtained through resource unit arrangement information indicated by the resource unit allocation field of the HE-SIG-B and a Null STA ID contained in a user field corresponding to a specific resource unit in the resource unit arrangement	4, 11
wherein the specific resource unit is at least one of a 26-tone resource unit, a 52-tone resource unit, and a 106-tone resource unit	5, 12
wherein when the bandwidth field indicates puncturing of one of two 20 MHz channels in a secondary 40 MHz channel within a bandwidth of 80 MHz or puncturing of at least one of two 20 MHz channels in a secondary 40 MHz channel within a bandwidth of 160 MHz or 80+80 MHz, the resource unit allocation field indicates which 20 MHz channel in the secondary 40 MHz channel is punctured	6, 13

Furthermore, Section 112 (f) allows a patentee to express a claim element “as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.” 35 U.S.C. § 112, ¶ 6. For such claims, the written description of the patent must disclose with sufficient particularity the corresponding structure for performing the claimed function, and it must clearly link that structure to the claimed function. *Ibormeith IP, LLC v. Mercedes-Benz USA, LLC*, 732 F.3d 1376, 1379 (Fed. Cir. 2013). Several of the ’281 patent Asserted Claims are invalid as indefinite because they contain means-plus-function terms subject to Section 112 (f), and the ’281 patent fails to disclose with sufficient particularity the corresponding structure for performing the claimed function.

The following limitations recited in the ’281 patent Asserted Claims are governed by Section 112 (f) and are indefinite in whole, in part or in combination:⁴³

⁴³ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
a processor ... configured to	1-6
a communication unit	1-6

3. Invalidity Under 35 U.S.C. § 101

Pursuant to the Court’s Standing Order, Defendants contend that the ’281 patent’s Asserted Claims are invalid under 35 U.S.C. § 101 because the claims are not directed to patent-eligible subject matter. Defendants’ contentions that the Asserted Claims are invalid under 35 U.S.C. § 101 do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Claims, or that any of the claims of the ’281 patent are not anticipated or rendered obvious by prior art.

All Asserted Claims of the ’281 patent are invalid under 35 U.S.C. § 101 because they fail to claim patent-eligible subject matter. The Asserted Claims are directed to the abstract idea of identifying unused resources. The claims recite a related abstract concept of identifying unassigned resource unit(s). The Asserted Claims, however, fail to describe anything beyond the abstract idea of identifying unused resources. None of the remaining claim elements, considered individually or as an ordered combination, transform the nature of the claims into patent-eligible subject matter. To the extent structure is claimed in any of the claims, that structure is nothing more than general purpose computer components performing general purpose computer functions. Such general purpose structure is insufficient to transform the nature of the claims into patent-eligible subject matter.

Further detail regarding Samsung’s contentions that the Asserted Claims of the ’281 patent do not qualify as patent-eligible subject matter are contained in Exhibit C101. Specifically, pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit C101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual

and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit C101, each Challenged Claim of the '281 patent is directed to an abstract idea and therefore is not directed to patent eligible subject matter. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit C101, which references and incorporates information from Exhibits C1-C13, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Samsung provides the following description of the relevant industry at the relevant time. As of the alleged priority date for the '281 patent (December 24, 2015), the relevant industry was well-developed. Wireless telecommunications, including cellular telecommunications had been around for decades. Further, all individual elements disclosed and recited in the '281 patent were conventional, routine, and well-known in the industry. *See generally* Exhibits C1-C13. By way of example, using HE-SIG-A to provide bandwidth information was known. *See, e.g.*, Exhibits C1-C13, C101 at [1e]. Also, using HE-SIG-B to provide which resource units are assigned or unassigned was known. *See, e.g.*, Exhibits C1-C13, C101 at [1f]. Further, channel puncturing was known. *See, e.g. See, e.g.*, Exhibits C1-C13, C101 at [1i]. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the '281 Patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '281 Patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

D. U.S. Patent No. 11,470,595

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '595 patent based on lack of written description under 35 U.S.C. § 112 (a); lack of enablement under 35 U.S.C. § 112 (a); and indefiniteness under 35 U.S.C. § 112 (b). These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '595 patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112 (a)

The '595 patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '595 patent Asserted Claims at the time the '595 patent was filed. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that "reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods.

The specification of the '595 patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '595 patent Asserted Claims without undue experimentation. To the extent the following limitations are definite (under 35 U.S.C. § 112 (b)), the application that became the '595 patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112 (a):⁴⁴

Term	Relevant Claim(s)
[receive/receiving] a wireless packet including an High Efficiency Signal A (HE-SIG-A) field and an High Efficiency Signal B (HE-SIG-B) field	1-6, 7-12
[obtain/obtaining] bandwidth information indicated via a bandwidth field included in the HE-SIG-A field	1-6, 7-12
[obtain/obtaining] information of an unassigned resource unit via at least one subfield included in the HE-SIG-B field	1-6, 7-12
<p>wherein the bandwidth field is related to bandwidth over which the received wireless packet is transmitted, and is used to obtain the information of the unassigned resource unit</p> <p>wherein the bandwidth field is related to bandwidth over which the received wireless packet is transmitted, and</p> <p>wherein the bandwidth field of HE-SIG-A is used to obtain the information of the unassigned resource unit</p>	1-6, 7-12
[decode/decoding] a data of the received wireless packet based on the bandwidth information and the information of the unassigned resource unit	1-6, 7-12
wherein the unassigned resource unit is explicitly indicated with the information of the unassigned resource unit based on the bandwidth field and the at least one subfield	1-6, 7-12
wherein the information of the unassigned resource unit includes information of a C26 field indicating whether a user is allocated to a center 26-tone resource unit of 80 MHz upon the bandwidth related to a transmission of the received wireless packet indicated by the bandwidth field being 80 MH or more, not 20 MHz or 40 MHz	1-6, 7-12
<p>wherein the HE-SIG-B field consists of HE-SIG-B content channel 1 and HE-SIG-B content channel 2 in units of 20 MHz respectively, and</p> <p>wherein the C26 field is carried in both the HE-SIG-B content channel 1 and the HE-SIG-B content channel 2</p>	2, 8

⁴⁴ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
wherein when the received wireless packet is transmitted in a total bandwidth of 80 MHz, both of a C26 field carried in the HE-SIG-B content channel 1 and a C26 field carried in the HE-SIG-B content channel 2 indicate whether a user is allocated to a center 26-tone resource unit in the total bandwidth of 80 MHz	3, 9
wherein when the C26 field indicates that a user is allocated to the center 26-tone resource unit, a user field corresponding to the center 26-tone resource unit is carried in a user specific field of the HE-SIG-B content channel 1	4, 10
wherein when the received wireless packet is transmitted in a total bandwidth of 160 MHz or 80+80 MHz, the total bandwidth includes a first 80 MHz bandwidth and a second 80 MHz bandwidth, a first C26 field carried in the HE-SIG-B content channel 1 indicates whether a user is allocated to a first center 26-tone resource unit in the first 80 MHz bandwidth, and a second C26 field carried in the HE-SIG-B content channel 2 indicates whether a user is allocated to a second center 26-tone resource unit in the second 80 MHz bandwidth	5, 11
wherein when the first C26 field indicates that a user is allocated to the first center 26-tone resource unit, a user field corresponding to the first center 26-tone resource unit is carried in a user specific field of the HE-SIG-B content channel 1, and wherein when the second C26 field indicates that a user is allocated to the second center 26-tone resource unit, a user field corresponding to the second center 26-tone resource unit is carried in a user specific field of the HE-SIG-B content channel 2	6, 12

2. Indefiniteness Under 35 U.S.C. § 112 (b)

Under § 112 (b), “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” *Id.* A patent is indefinite under § 112 (b) “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the ’595 patent Asserted Claims are invalid because they fail to inform those skilled in the art about the scope of the invention with reasonable

certainty and are indefinite under § 112 (a), for failing to particularly point out and distinctly claim the subject matter the applicants regard as their invention.

The following limitations recited in the '595 patent Asserted Claims are indefinite in whole, in part or in combination:⁴⁵

Term	Relevant Claim(s)
[receive/receiving] a wireless packet including an High Efficiency Signal A (HE-SIG-A) field and an High Efficiency Signal B (HE-SIG-B) field	1-6, 7-12
[obtain/obtaining] bandwidth information indicated via a bandwidth field included in the HE-SIG-A field	1-6, 7-12
[obtain/obtaining] information of an unassigned resource unit via at least one subfield included in the HE-SIG-B field	1-6, 7-12
wherein the bandwidth field is related to bandwidth over which the received wireless packet is transmitted, and is used to obtain the information of the unassigned resource unit	1-6, 7-12
wherein the bandwidth field is related to bandwidth over which the received wireless packet is transmitted, and wherein the bandwidth field of HE-SIG-A is used to obtain the information of the unassigned resource unit	1-6, 7-12
[decode/decoding] a data of the received wireless packet based on the bandwidth information and the information of the unassigned resource unit	1-6, 7-12
wherein the unassigned resource unit is explicitly indicated with the information of the unassigned resource unit based on the bandwidth field and the at least one subfield	1-6, 7-12
wherein the information of the unassigned resource unit includes information of a C26 field indicating whether a user is allocated to a center 26-tone resource unit of 80 MHz upon the bandwidth related to a transmission of the received wireless packet indicated by the bandwidth field being 80 MH or more, not 20 MHz or 40 MHz	1-6, 7-12
wherein the HE-SIG-B field consists of HE-SIG-B content channel 1 and HE-SIG-B content channel 2 in units of 20 MHz respectively, and wherein the C26 field is carried in both the HE-SIG-B content channel 1 and the HE-SIG-B content channel 2	2, 8
wherein when the received wireless packet is transmitted in a total bandwidth of 80 MHz, both of a C26 field carried in the HE-SIG-B	3, 9

⁴⁵ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
content channel 1 and a C26 field carried in the HE-SIG-B content channel 2 indicate whether a user is allocated to a center 26-tone resource unit in the total bandwidth of 80 MHz	
wherein when the C26 field indicates that a user is allocated to the center 26-tone resource unit, a user field corresponding to the center 26-tone resource unit is carried in a user specific field of the HE-SIG-B content channel 1	4, 10
wherein when the received wireless packet is transmitted in a total bandwidth of 160 MHz or 80+80 MHz, the total bandwidth includes a first 80 MHz bandwidth and a second 80 MHz bandwidth, a first C26 field carried in the HE-SIG-B content channel 1 indicates whether a user is allocated to a first center 26-tone resource unit in the first 80 MHz bandwidth, and a second C26 field carried in the HE-SIG-B content channel 2 indicates whether a user is allocated to a second center 26-tone resource unit in the second 80 MHz bandwidth	5, 11
wherein when the first C26 field indicates that a user is allocated to the first center 26-tone resource unit, a user field corresponding to the first center 26-tone resource unit is carried in a user specific field of the HE-SIG-B content channel 1, and wherein when the second C26 field indicates that a user is allocated to the second center 26-tone resource unit, a user field corresponding to the second center 26-tone resource unit is carried in a user specific field of the HE-SIG-B content channel 2	6, 12

Furthermore, Section 112 (f) allows a patentee to express a claim element “as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.” 35 U.S.C. § 112, ¶ 6. For such claims, the written description of the patent must disclose with sufficient particularity the corresponding structure for performing the claimed function, and it must clearly link that structure to the claimed function. *Ibormeith IP, LLC v. Mercedes-Benz USA, LLC*, 732 F.3d 1376, 1379 (Fed. Cir. 2013). Several of the ’595 patent Asserted Claims are invalid as indefinite because they contain means-plus-function terms subject to Section 112 (f), and the ’595 patent fails to disclose with sufficient particularity the corresponding structure for performing the claimed function.

The following limitations recited in the '595 patent Asserted Claims are governed by Section 112 (f) and are indefinite in whole, in part or in combination:⁴⁶

Term	Relevant Claim(s)
a processor ... configured to	1-6

3. Invalidity Under 35 U.S.C. § 101

Pursuant to the Court's Standing Order, Defendants contend that the '595 patent's Asserted Claims are invalid under 35 U.S.C. § 101 because the claims are not directed to patent-eligible subject matter. Defendants' contentions that the Asserted Claims are invalid under 35 U.S.C. § 101 do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Claims, or that any of the claims of the '595 patent are not anticipated or rendered obvious by prior art.

All Asserted Claims of the '595 patent are invalid under 35 U.S.C. § 101 because they fail to claim patent-eligible subject matter. The Asserted Claims are directed to the abstract idea of identifying unused resources. The claims recite a related abstract concept of identifying unassigned resource unit(s). The Asserted Claims, however, fail to describe anything beyond the abstract idea of identifying unused resources. None of the remaining claim elements, considered individually or as an ordered combination, transform the nature of the claims into patent-eligible subject matter. To the extent structure is claimed in any of the claims, that structure is nothing more than general purpose computer components performing general purpose computer functions. Such general purpose structure is insufficient to transform the nature of the claims into patent-eligible subject matter.

⁴⁶ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Further detail regarding Samsung's contentions that the Asserted Claims of the '595 patent do not qualify as patent-eligible subject matter are contained in Exhibit D101. Specifically, pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit D101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit D101, each Challenged Claim of the '595 patent is directed to an abstract idea and therefore is not directed to patent eligible subject matter. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit D101, which references and incorporates information from Exhibits D1-D16, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Samsung provides the following description of the relevant industry at the relevant time. As of the alleged priority date for the '595 Patent (December 24, 2015), the relevant industry was well-developed. Wireless telecommunications, including cellular telecommunications had been around for decades. Further, all individual elements disclosed and recited in the '595 patent were conventional, routine, and well-known in the industry. *See generally* Exhibits D1-D16. By way of example, using HE-SIG-A to provide bandwidth information was known. *See, e.g.*, Exhibits, D101 at [1c]. Also, using HE-SIG-B to provide which resource units are assigned or unassigned was known. *See, e.g.*, Exhibits D1-D16, D101 at [1d]. Further, providing information as to whether a user allocated to a center 26-tone resource unit was known. *See, e.g. See, e.g.*, Exhibits D1-D16, D101 at [1h].

Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the '281 Patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '281 Patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

E. U.S. Patent No. 11,116,035

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '035 patent based on lack of written description under 35 U.S.C. § 112 (a); lack of enablement under 35 U.S.C. § 112 (a); indefiniteness under 35 U.S.C. § 112 (b); and indefiniteness under 35 U.S.C. § 112 (f). These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '035 patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112 (a)

The '035 patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '035 patent Asserted Claims at the time the '035 patent was filed. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351

(Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that “reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods.

The specification of the '035 patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '035 patent Asserted Claims without undue experimentation. To the extent the following limitations are definite (under 35 U.S.C. § 112 (b)), the application that became the '035 patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112 (a):⁴⁷

Term	Relevant Claim(s)
transmit, to the base wireless communication terminal, a trigger-based physical layer protocol data unit (PPDU) using the transceiver,	1, 8
switch a parameter set, which is a set of parameters used for the channel access, from a first parameter set to a second parameter set based on whether the base wireless communication terminal triggers a multi-user uplink transmission participation of the wireless communication terminal,	1, 8
when a MAC protocol data unit (MPDU) included in the trigger-based PPDU does not request an immediate response, set a second parameter set timer for an access category of the MPDU when the transmission of the trigger-based PPDU ends,	1, 8
when the MPDU included in the trigger-based PPDU requests the immediate response, set the second parameter set timer for the access category of the MPDU for which immediate response is received,	1, 8
when the second parameter set timer expires, terminate an application of the second parameter set, and	1, 8
access a channel according to a priority of data to be transmitted to the base communication terminal by the wireless communication terminal and the parameter set.	1, 8

⁴⁷ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
wherein the MPDU included in the trigger-based PPDU is a QoS data frame.	2, 9
wherein the processor is configured to receive a beacon frame from the base wireless communication terminal and obtain information indicating a period of the second parameter set timer from the beacon frame.	3, 10
wherein the processor is configured to calculate a random integer value within a contention window (CW), set a backoff timer based on the random integer value, and access the channel based on the back off timer and a predetermined slot time,	4, 5
wherein the parameter set comprises a minimum value (CWmin) of the CW and a maximum value (CWmax) of the CW.	4
wherein the parameter set comprises a minimum value (CWmin) of the CW and a maximum value (CWmax) of the CW.	5

2. Indefiniteness Under 35 U.S.C. § 112 (b)

Under § 112 (b), “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” *Id.* A patent is indefinite under § 112 (b) “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the ’035 patent Asserted Claims are invalid because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite under § 112 (a), for failing to particularly point out and distinctly claim the subject matter the applicants regard as their invention.

The following limitations recited in the ’035 patent Asserted Claims are indefinite in whole, in part or in combination:⁴⁸

⁴⁸ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
set	1, 3, 4, 5, 8, 10
parameter set	1, 8
immediate response	1, 8
first parameter set	1, 8
second parameter set	1, 3, 8
set of parameters used for the channel access	1, 8
period of the parameter set timer	3, 10
second parameter set timer	1, 3, 8, 10
priority of data	1, 8
predetermined slot time	4, 5
beacon frame	3, 10
QoS Data Frame	2, 9
a trigger-based physical layer protocol data unit (PPDU)	1, 2, 8, 9
a MAC protocol data unit (MPDU)	1, 8
when a MAC protocol data unit (MPDU) included in the trigger-based PPDU does not request an immediate response,	1, 8
when the MPDU included in the trigger-based PPDU requests the immediate response,	1, 8
setting a second parameter set timer	1, 8
set a back off timer	4, 5
channel	1, 8
channel access	1, 8
access category	1, 8
a multi-user uplink transmission participation of the wireless communication terminal	1, 8
access a channel according to a priority of data to be transmitted	1, 8
terminate an application of the second parameter set	1, 8
switch a parameter set	1, 8
when the transmission of the trigger-based PPDU ends	1, 8
for the access category of the MPDU for which immediate response is received,	1, 8
when the second parameter set timer expires	1, 8
transmit, to the base wireless communication terminal, a trigger-based physical layer protocol data unit (PPDU) using the transceiver,	1, 8
switch a parameter set, which is a set of parameters used for the channel access, from a first parameter set to a second parameter set based on whether the base wireless communication terminal triggers a multi-user uplink transmission participation of the wireless communication terminal,	1, 8
when a MAC protocol data unit (MPDU) included in the trigger-based PPDU does not request an immediate response, set a second parameter set timer for an access category of the MPDU when the transmission of the trigger-based PPDU ends,	1, 8

Term	Relevant Claim(s)
when the MPDU included in the trigger-based PPDU requests the immediate response, set the second parameter set timer for the access category of the MPDU for which immediate response is received,	1, 8
when the second parameter set timer expires, terminate an application of the second parameter set, and	1, 8
access a channel according to a priority of data to be transmitted to the base communication terminal by the wireless communication terminal and the parameter set.	1, 8
wherein the MPDU included in the trigger-based PPDU is a QoS data frame.	2, 9
receive a beacon frame from the base wireless communication terminal	3, 10
obtain information indicating a period of the second parameter set timer from the beacon frame.	3, 10
calculate a random integer value within a contention window (CW),	4, 5
set a backoff timer based on the random integer value, and	4, 5
access the channel based on the back off timer and a predetermined slot time,	4, 5
wherein the parameter set comprises a minimum value (CW _{min}) of the CW and a maximum value (CW _{max}) of the CW.	4
if a value of the CW is greater than the maximum value (CW _{max}) of the CW according to a priority of the data to be transmitted, sets the value of the CW to the CW _{max} .	5

Furthermore, Section 112 (f) allows a patentee to express a claim element “as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.” 35 U.S.C. § 112 (f). For such claims, the written description of the patent must disclose with sufficient particularity the corresponding structure for performing the claimed function, and it must clearly link that structure to the claimed function. *Ibormeith IP, LLC v. Mercedes-Benz USA, LLC*, 732 F.3d 1376, 1379 (Fed. Cir. 2013). Several of the ’035 patent Asserted Claims are invalid as indefinite because they contain means-plus-function terms subject to Section 112 (f), and the ’035 patent fails to disclose with sufficient particularity the corresponding structure for performing the claimed function.

The following limitations recited in the '035 patent Asserted Claims are governed by Section 112 (f) and are indefinite in whole, in part or in combination:⁴⁹

Term	Relevant Claim(s)
<p>“a processor, wherein the processor is configured to: transmit, to the base wireless communication terminal, a trigger-based physical layer protocol data unit (PPDU) using the transceiver, switch a parameter set, which is a set of parameters used for the channel access, from a first parameter set to a second parameter set based on whether the base wireless communication terminal triggers a multi-user uplink transmission participation of the wireless communication terminal, when a MAC protocol data unit (MPDU) included in the trigger-based PPDU does not request an immediate response, set a second parameter set timer for an access category of the MPDU when the transmission of the trigger-based PPDU ends, when the MPDU included in the trigger-based PPDU requests the immediate response, set the second parameter set timer for the access category of the MPDU for which immediate response is received, when the second parameter set timer expires, terminate an application of the second parameter set, and access a channel according to a priority of data to be transmitted to the base communication terminal by the wireless communication terminal and the parameter set.”</p>	<p>1-5</p>

3. Invalidity Under 35 U.S.C. § 101

Pursuant to the Court’s Standing Order, Defendants contend that the '035 patent’s Asserted Claims are invalid under 35 U.S.C. § 101 because the claims are not directed to patent-eligible subject matter. Defendants’ contentions that the Asserted Claims are invalid under 35 U.S.C. § 101 do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Claims, or that any of the claims of the '035 patent are not anticipated or rendered obvious by prior art.

⁴⁹ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

All Asserted Claims of the '035 patent are invalid under 35 U.S.C. § 101 because they fail to claim patent-eligible subject matter. The Asserted Claims are directed to the abstract idea of analyzing data and using the data to select parameters. The Asserted Claims, however, fail to describe anything beyond the abstract idea of analyzing data and using the data to select parameters. None of the remaining claim elements, considered individually or as an ordered combination, transform the nature of the claims into patent-eligible subject matter. To the extent structure is claimed in any of the claims, that structure is nothing more than general purpose computer components performing general purpose computer functions. Such general purpose structure is insufficient to transform the nature of the claims into patent-eligible subject matter.

Further detail regarding Samsung's contentions that the Asserted Claims of the '035 patent do not qualify as patent-eligible subject matter are contained in Exhibit E101. Specifically, pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit E101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit E101, each Challenged Claim of the '035 patent is directed to an abstract idea and therefore is not directed to patent eligible subject matter. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit E101, which references and incorporates information from Exhibits E1-E27, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Samsung provides the following description of the relevant industry at the relevant time. As of the alleged priority date for the '035 patent (September 7, 2016), the relevant industry was well-developed. Wireless telecommunications, including cellular telecommunications had been around for decades. Further, all individual elements disclosed and recited in the '035 patent were conventional, routine, and well-known in the industry. *See generally* Exhibits E1-E27. By way of example, processors and transceivers were known. *See, e.g.*, Exhibits E1-E27, E101 at [1a]–[1b]. The need for enhanced distributed channel access was known. *See, e.g.*, Exhibits E1-E27, E101 at 1[pre]. It was also well known to transmit a trigger-based physical layer protocol data unit using a transceiver. *See, e.g.*, Exhibits E1-E27, E101 at [1c]. It was also well known that parameters used for channel access could be switched from a first set to a second set based on the content of a frame. E1-E27, E101 at [1d]. Further, setting a timer for an access category based on whether an immediate response was requested was also well known, as was terminating an application and accessing a channel according to data priority. *See, e.g.* Exhibits E1-E27, E101 at [1e]–[1h]. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the '035 patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '035 patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

F. U.S. Patent No. 11,516,879

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '879 patent based on lack of written description under 35 U.S.C. § 112 (a); lack of enablement under 35 U.S.C. § 112 (a); indefiniteness under 35 U.S.C. § 112 (b); and indefiniteness under 35 U.S.C. § 112 (f). These contentions shall not be construed as an admission that any claim construction

advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '879 patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112 (a)

The '879 patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '879 patent Asserted Claims at the time the '879 patent was filed. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that "reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods.

The specification of the '879 patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '879 patent Asserted Claims without undue experimentation. To the extent the following limitations are definite (under 35 U.S.C. § 112 (b)),

the application that became the '879 patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112 (a):⁵⁰

Term	Relevant Claim(s)
receive, from the base wireless communication terminal, a trigger frame using the transceiver, wherein the trigger frame triggers a orthogonal frequency division multiple access (OFDMA) uplink transmission of the wireless communication terminal,	1, 8
transmit, to the base wireless communication terminal, a trigger-based physical layer protocol data unit (PPDU) in response to the trigger frame using the transceiver,	1, 8
switch a parameter set, which is a set of parameters used for the channel access, from a first parameter set to a second parameter set based on whether the base wireless communication terminal triggers a multi-user uplink transmission participation of the wireless communication terminal,	1, 8
when a MAC protocol data unit (MPDU) included in the trigger-based PPDU does not request an immediate response, set a second parameter set timer for an access category of the MPDU when the transmission of the trigger-based PPDU ends,	1, 8
when the MPDU included in the trigger-based PPDU requests an immediate response, set the second parameter set timer for the access category of the MPDU for which immediate response is received,	1, 8
when the second parameter set timer expires, terminate an application of the second parameter set, and	1, 8
access a channel according to a priority of data to be transmitted to the base communication terminal by the wireless communication terminal and the parameter set.	1, 8
wherein the MPDU included in the trigger-based PPDU is a QoS data frame.	2, 9
wherein the processor is configured to receive a beacon frame from the base wireless communication terminal and obtain information indicating a period of the second parameter set timer from the beacon frame.	3, 10
wherein the processor is configured to calculate a random integer value within a contention window (CW), set a backoff timer based on the random integer value, and access the channel based on the back off timer and a predetermined slot time,	4, 5
wherein the parameter set comprises a minimum value (CWmin) of the CW and a maximum value (CWmax) of the CW.	4

⁵⁰ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
if a value of the CW is greater than the maximum value (CWmax) of the CW according to a priority of the data to be transmitted, sets the value of the CW to the CWmax.	5
transmitting the data through the channel.	8

2. Indefiniteness Under 35 U.S.C. § 112 (b)

Under § 112 (b), “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” *Id.* A patent is indefinite under § 112 (b) “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the ’879 patent Asserted Claims are invalid because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite under § 112 (a), for failing to particularly point out and distinctly claim the subject matter the applicants regard as their invention.

The following limitations recited in the ’879 patent Asserted Claims are indefinite in whole, in part or in combination:⁵¹

Term	Relevant Claim(s)
triggers a orthogonal frequency division multiple access (OFDMA) uplink transmission of the wireless communication terminal	1, 8
set	1, 3, 4, 5, 8, 10
parameter set	1, 8
immediate response	1, 8
first parameter set	1, 8
second parameter set	1, 3, 8
set of parameters used for the channel access	1, 8
period of the parameter set timer	3, 10
second parameter set timer	1, 3, 8, 10
priority of data	1, 8

⁵¹ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
predetermined slot time	4, 5
beacon frame	3, 10
QoS Data Frame	2, 9
a trigger-based physical layer protocol data unit (PPDU)	1, 2, 8, 9
a MAC protocol data unit (MPDU)	1, 8
when a MAC protocol data unit (MPDU) included in the trigger-based PPDU does not request an immediate response,	1, 8
when the MPDU included in the trigger-based PPDU requests the immediate response,	1, 8
setting a second parameter set timer	1, 8
set a back off timer	4, 5
channel	1, 8
channel access	1, 8
access category	1, 8
a multi-user uplink transmission participation of the wireless communication terminal	1, 8
access a channel according to a priority of data to be transmitted	1, 8
terminate an application of the second parameter set	1, 8
switch a parameter set	1, 8
when the transmission of the trigger-based PPDU ends	1, 8
for the access category of the MPDU for which immediate response is received,	1, 8
when the second parameter set timer expires	1, 8
receive, from the base wireless communication terminal, a trigger frame using the transceiver, wherein the trigger frame triggers a orthogonal frequency division multiple access (OFDMA) uplink transmission of the wireless communication terminal,	1, 8
transmit, to the base wireless communication terminal, a trigger-based physical layer protocol data unit (PPDU) in response to the trigger frame using the transceiver,	1, 8
switch a parameter set, which is a set of parameters used for the channel access, from a first parameter set to a second parameter set based on whether the base wireless communication terminal triggers a multi-user uplink transmission participation of the wireless communication terminal,	1, 8
when a MAC protocol data unit (MPDU) included in the trigger-based PPDU does not request an immediate response, set a second parameter set timer for an access category of the MPDU when the transmission of the trigger-based PPDU ends,	1, 8
when the MPDU included in the trigger-based PPDU requests an immediate response, set the second parameter set timer for the access category of the MPDU for which immediate response is received,	1, 8

Term	Relevant Claim(s)
when the second parameter set timer expires, terminate an application of the second parameter set, and	1, 8
access a channel according to a priority of data to be transmitted to the base communication terminal by the wireless communication terminal and the parameter set.	1, 8
wherein the MPDU included in the trigger-based PPDU is a QoS data frame.	2, 9
wherein the processor is configured to receive a beacon frame from the base wireless communication terminal	3, 10
obtain information indicating a period of the second parameter set timer from the beacon frame.	3, 10
wherein the processor is configured to calculate a random integer value within a contention window (CW),	4, 5
set a backoff timer based on the random integer value, and	4, 5
access the channel based on the back off timer and a predetermined slot time,	4, 5
wherein the parameter set comprises a minimum value (CWmin) of the CW and a maximum value (CWmax) of the CW.	4
if a value of the CW is greater than the maximum value (CWmax) of the CW according to a priority of the data to be transmitted, sets the value of the CW to the CWmax.	5
transmitting the data through the channel.	8

Furthermore, Section 112 (f) allows a patentee to express a claim element “as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.” 35 U.S.C. § 112 (f). For such claims, the written description of the patent must disclose with sufficient particularity the corresponding structure for performing the claimed function, and it must clearly link that structure to the claimed function. *Ibormeith IP, LLC v. Mercedes-Benz USA, LLC*, 732 F.3d 1376, 1379 (Fed. Cir. 2013). Several of the ’879 patent Asserted Claims are invalid as indefinite because they contain means-plus-function terms subject to Section 112 (f), and the ’879 patent fails to disclose with sufficient particularity the corresponding structure for performing the claimed function.

The following limitations recited in the '879 patent Asserted Claims are governed by Section 112 (f) and are indefinite in whole, in part or in combination.⁵²

Term	Relevant Claim(s)
<p>“a processor, wherein the processor is configured to: receive, from the base wireless communication terminal, a trigger frame using the transceiver, wherein the trigger frame triggers a orthogonal frequency division multiple access (OFDMA) uplink transmission of the wireless communication terminal, transmit, to the base wireless communication terminal, a trigger-based physical layer protocol data unit (PPDU) in response to the trigger frame using the transceiver, switch a parameter set, which is a set of parameters used for the channel access, from a first parameter set to a second parameter set based on whether the base wireless communication terminal triggers a multi-user uplink transmission participation of the wireless communication terminal, when a MAC protocol data unit (MPDU) included in the trigger-based PPDU does not request an immediate response, set a second parameter set timer for an access category of the MPDU when the transmission of the trigger-based PPDU ends, when the MPDU included in the trigger-based PPDU requests an immediate response, set the second parameter set timer for the access category of the MPDU for which immediate response is received, when the second parameter set timer expires, terminate an application of the second parameter set, and access a channel according to a priority of data to be transmitted to the base communication terminal by the wireless communication terminal and the parameter set.</p>	<p>1-5</p>

3. Invalidity Under 35 U.S.C. § 101

Pursuant to the Court’s Standing Order, Defendants contend that the '879 patent’s Asserted Claims are invalid under 35 U.S.C. § 101 because the claims are not directed to patent-eligible subject matter. Defendants’ contentions that the Asserted Claims are invalid under 35 U.S.C. § 101 do not constitute, and should not be interpreted as, admissions regarding the construction or

⁵² Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

scope of the claims of the Asserted Claims, or that any of the claims of the '879 patent are not anticipated or rendered obvious by prior art.

All Asserted Claims of the '879 patent are invalid under 35 U.S.C. § 101 because they fail to claim patent-eligible subject matter. The Asserted Claims are directed to the abstract idea of analyzing data and using the data to select parameters. The Asserted Claims, however, fail to describe anything beyond the abstract idea of analyzing data and using the data to select parameters. None of the remaining claim elements, considered individually or as an ordered combination, transform the nature of the claims into patent-eligible subject matter. To the extent structure is claimed in any of the claims, that structure is nothing more than general purpose computer components performing general purpose computer functions. Such general purpose structure is insufficient to transform the nature of the claims into patent-eligible subject matter.

Further detail regarding Samsung's contentions that the Asserted Claims of the '879 patent do not qualify as patent-eligible subject matter are contained in Exhibit F101. Specifically, pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit F101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit F101, each Challenged Claim of the '879 patent is directed to an abstract idea and therefore is not directed to patent eligible subject matter. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit F101, which references and incorporates information from Exhibits F1-F27, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the

relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Samsung provides the following description of the relevant industry at the relevant time. As of the alleged priority date for the '879 patent (September 7, 2016), the relevant industry was well-developed. Wireless telecommunications, including cellular telecommunications had been around for decades. Further, all individual elements disclosed and recited in the '879 patent were conventional, routine, and well-known in the industry. *See generally* Exhibits F1-F27. By way of example, the need for enhanced distributed channel access was known. *See, e.g.*, Exhibits F1-F27, F101 at 1[pre]. Processors and transceivers were known. *See, e.g.*, Exhibits F1-F27, F101 at [1a]–[1b]. Trigger frames which trigger an OFDMA uplink transmission were known. *See, e.g.*, Exhibits F1-F27, F101 at [1c]. It was also well known to transmit a trigger-based physical layer protocol data unit using a transceiver. *See, e.g.*, Exhibits F1-F27, F101 at [1d]. It was also well known that parameters used for channel access could be switched from a first set to a second set based on the content of a frame. F1-F27, F101 at [1e]. Further, setting a timer for an access category based on whether an immediate response was requested was also well known, as was terminating an application and accessing a channel according to data priority. *See, e.g.* Exhibits F1-F27, F101 at [1f]–[1i]. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the '879 patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '879 patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

G. U.S. Patent No. 11,129,163

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '163 patent based on lack of written description under 35 U.S.C. § 112 (a); lack of enablement under 35 U.S.C. § 112 (a); indefiniteness under 35 U.S.C. § 112 (b); and indefiniteness under 35 U.S.C. § 112 (f). These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '163 patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112 (a)

The '163 patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '163 patent Asserted Claims at the time the '163 patent was filed. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that “reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.* One of ordinary skill in the art would not have understood that the inventors were in possession of the full scope of the claimed apparatus and methods.

The specification of the '163 patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '163 patent Asserted Claims without undue experimentation. To the extent the following limitations are definite (under 35 U.S.C. § 112 (b)), the application that became the '163 patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112 (a):⁵³

Term	Relevant Claim(s)
“wherein the processor is configured to receive a physical layer convergence procedure (PLCP) Processing Data Unit (PPDU) by using the transceiver,”	1-8
“wherein the processor is configured . . . not to use a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed,”	1-8
“wherein the BSS color is an identifier of a BSS,”	1-16
“wherein the signaling information is transmitted from a base wireless communication terminal to which the wireless communication terminal is associated.”	1-16
“wherein the processor is configured not to set an Intra-BSS Network Allocation Vector (NAV) by using the BSS color indicated by a signaling field of the PPDU when the signaling information indicates that the operation based on the BSS color is not allowed,”	2, 3
“wherein the Intra-BSS NAV is different from a Basic NAV and is a NAV which is set based on an Intra-BSS PPDU,”	2, 3, 10, 11
“wherein the Basic NAV is set based on an Inter-BSS PPDU or a PPDU which is not able to be identified as the Inter-BSS PPDU or the Intra-BSS PPDU.”	2, 3, 10, 11
“wherein the PPDU includes a TXOP Duration field in the signaling field of the PPDU and a medium access control (MAC) frame which includes a duration field,”	3, 11
“wherein the TXOP Duration field indicates information used for setting the Intra-BSS NAV and the Basic NAV,”	3, 11
“wherein the duration field indicates information used for setting the Intra-BSS NAV and the Basic NAV,”	3, 11
“wherein the processor is configured not to use the TXOP Duration field for setting the Intra-BSS NAV or the Basic NAV when the wireless communication terminal gets a valid signaling field of the MAC frame.”	3

⁵³ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
“wherein the processor is configured to signal that the operation based on the BSS color is not allowed when the wireless communication terminal recognizes that a BSS color collision has occurred,”	4, 5
“wherein the BSS color collision represents that different BSSs correspond to one BSS color.”	4, 5, 12, 13
“wherein the processor is configured to determine that BSS color collision has occurred based on address fields of a medium access control (MAC) frame.”	5
“wherein the operation based on the BSS color includes entering a doze state of a power save operation based on a BSS color indicated by a signaling field of the PPDU,”	6, 14
“wherein the power save operation is an operation for the wireless communication terminal to enter the doze state until an end of a received PPDU which is an Intra-BSS PPDU.”	6, 14
“wherein the processor is configured not to perform a spatial reuse operation when the BSS color indicated by the signaling field of the PPDU is a predetermined value.”	7, 8
“wherein the predetermined value is 0.”	8, 16
“receiving a physical layer convergence procedure (PLCP) Processing Data Unit (PPDU)”	9-16
“not using a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed,”	9-16
“wherein the method further comprises not setting an Intra-BSS Network Allocation Vector (NAV) by using the BSS color indicated by a signaling field of the PPDU when the signaling information indicates that the operation based on the BSS color is not allowed,”	10, 11
“wherein the method further comprises not using the TXOP Duration field for setting the Intra-BSS NAV or the Basic NAV when the wireless communication terminal gets a valid signaling field of the MAC frame.”	11
“wherein the method further comprises signal that the operation based on the BSS color is not allowed when the wireless communication terminal recognizes that a BSS color collision has occurred,”	12, 13
“wherein the signaling that a BSS color collision has occurred comprises determining that BSS color collision has occurred based on address fields of a medium access control (MAC) frame.”	13
“wherein the method further comprises not performing a spatial reuse operation when the BSS color indicated by the signaling field of the PPDU is a predetermined value.”	15, 16

2. Indefiniteness Under 35 U.S.C. § 112 (b)

Under § 112 (b), “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” *Id.* A patent is indefinite under § 112 (b) “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the ’163 patent Asserted Claims are invalid because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite under § 112 (a), for failing to particularly point out and distinctly claim the subject matter the applicants regard as their invention.

The following limitations recited in the ’163 patent Asserted Claims are indefinite in whole, in part or in combination:⁵⁴

Term	Relevant Claim(s)
“wherein the processor is configured to receive a physical layer convergence procedure (PLCP) Processing Data Unit (PPDU) by using the transceiver,”	1-8
“wherein the processor is configured . . . not to use a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed,”	1-8
“wherein the BSS color is an identifier of a BSS,”	1-16
“wherein the signaling information is transmitted from a base wireless communication terminal to which the wireless communication terminal is associated.”	1-16
“wherein the processor is configured not to set an Intra-BSS Network Allocation Vector (NAV) by using the BSS color indicated by a signaling field of the PPDU when the signaling information indicates that the operation based on the BSS color is not allowed,”	2, 3
“wherein the Intra-BSS NAV is different from a Basic NAV and is a NAV which is set based on an Intra-BSS PPDU,”	2, 3, 10, 11

⁵⁴ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
“wherein the Basic NAV is set based on an Inter-BSS PPDU or a PPDU which is not able to be identified as the Inter-BSS PPDU or the Intra-BSS PPDU.”	2, 3, 10, 11
“wherein the PPDU includes a TXOP Duration field in the signaling field of the PPDU and a medium access control (MAC) frame which includes a duration field,”	3, 11
“wherein the TXOP Duration field indicates information used for setting the Intra-BSS NAV and the Basic NAV,”	3, 11
“wherein the duration field indicates information used for setting the Intra-BSS NAV and the Basic NAV,”	3, 11
“wherein the processor is configured not to use the TXOP Duration field for setting the Intra-BSS NAV or the Basic NAV when the wireless communication terminal gets a valid signaling field of the MAC frame.”	3
“wherein the processor is configured to signal that the operation based on the BSS color is not allowed when the wireless communication terminal recognizes that a BSS color collision has occurred,”	4, 5
“wherein the BSS color collision represents that different BSSs correspond to one BSS color.”	4, 5, 12, 13
“wherein the processor is configured to determine that BSS color collision has occurred based on address fields of a medium access control (MAC) frame.”	5
“wherein the operation based on the BSS color includes entering a doze state of a power save operation based on a BSS color indicated by a signaling field of the PPDU,”	6, 14
“wherein the power save operation is an operation for the wireless communication terminal to enter the doze state until an end of a received PPDU which is an Intra-BSS PPDU.”	6, 14
“wherein the processor is configured not to perform a spatial reuse operation when the BSS color indicated by the signaling field of the PPDU is a predetermined value.”	7, 8
“wherein the predetermined value is 0.”	8, 16
“receiving a physical layer convergence procedure (PLCP) Processing Data Unit (PPDU)”	9-16
“not using a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed,”	9-16
“wherein the method further comprises not setting an Intra-BSS Network Allocation Vector (NAV) by using the BSS color indicated by a signaling field of the PPDU when the signaling information indicates that the operation based on the BSS color is not allowed,”	10, 11
“wherein the method further comprises not using the TXOP Duration field for setting the Intra-BSS NAV or the Basic NAV	11

Term	Relevant Claim(s)
when the wireless communication terminal gets a valid signaling field of the MAC frame.”	
“wherein the method further comprises signal that the operation based on the BSS color is not allowed when the wireless communication terminal recognizes that a BSS color collision has occurred,”	12, 13
“wherein the signaling that a BSS color collision has occurred comprises determining that BSS color collision has occurred based on address fields of a medium access control (MAC) frame.”	13
“wherein the method further comprises not performing a spatial reuse operation when the BSS color indicated by the signaling field of the PPDU is a predetermined value.”	15, 16

Furthermore, Section 112 (f) allows a patentee to express a claim element “as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.” 35 U.S.C. § 112, ¶ 6. For such claims, the written description of the patent must disclose with sufficient particularity the corresponding structure for performing the claimed function, and it must clearly link that structure to the claimed function. *Ibormeith IP, LLC v. Mercedes-Benz USA, LLC*, 732 F.3d 1376, 1379 (Fed. Cir. 2013). Several of the ’163 patent Asserted Claims are invalid as indefinite because they contain means-plus-function terms subject to Section 112 (f), and the ’163 patent fails to disclose with sufficient particularity the corresponding structure for performing the claimed function.

The following limitations recited in the ’163 patent Asserted Claims are governed by Section 112 (f) and are indefinite in whole, in part or in combination:⁵⁵

Term	Relevant Claim(s)
“wherein the processor is configured to receive a physical layer convergence procedure (PLCP) Processing Data Unit (PPDU) by using the transceiver, and not to use a Basic Service Set (BSS) color when signaling information indicates that an operation based on the BSS color is not allowed,”	1-8

⁵⁵ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

3. Invalidity Under 35 U.S.C. § 101

Pursuant to the Court's Standing Order, Defendants contend that the '163 patent's Asserted Claims are invalid under 35 U.S.C. § 101 because the claims are not directed to patent-eligible subject matter. Defendants' contentions that the Asserted Claims are invalid under 35 U.S.C. § 101 do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Claims, or that any of the claims of the '163 patent are not anticipated or rendered obvious by prior art.

All Asserted Claims of the '163 patent are invalid under 35 U.S.C. § 101 because they fail to claim patent-eligible subject matter. The Asserted Claims are directed to the abstract idea of disallowing operation on the basis of a group identifier. The claims recite a related abstract concept of recognizing an identifier collision/contention. The Asserted Claims, however, fail to describe anything beyond the abstract idea of disallowing operation on the basis of a group identifier. None of the remaining claim elements, considered individually or as an ordered combination, transform the nature of the claims into patent-eligible subject matter. To the extent structure is claimed in any of the claims, that structure is nothing more than general purpose computer components performing general purpose computer functions. Such general-purpose structure is insufficient to transform the nature of the claims into patent-eligible subject matter.

Further detail regarding Samsung's contentions that the Asserted Claims of the '163 patent do not qualify as patent-eligible subject matter are contained in Exhibit G101. Specifically, pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit G101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit G101, each Challenged Claim of the '163 patent is directed to an abstract idea and therefore is not directed to

patent eligible subject matter. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit G101, which references and incorporates information from Exhibits G1-G24, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Samsung provides the following description of the relevant industry at the relevant time. As of the alleged priority date for the '163 patent (March 4, 2016), the relevant industry was well-developed. Wireless telecommunications—including Wi-Fi—had been around for decades. Further, all individual elements disclosed and recited in the '163 patent were conventional, routine, and well-known in the industry. *See generally* Exhibits G1-G24. By way of example, wireless communication terminals (*e.g.*, stations, wireless devices, etc.) were well-known. *See, e.g.*, Exhibits G1-G24, G101 at 1[pre]. Both transceivers and processors were also well-known. *See, e.g.*, G1-G24, G101 at 1[a], 1[b]. Further, receiving a physical layer protocol data unit (“PPDU”) and not performing a BSS color-based operation when received signaling information indicates the operation is not allowed was well-known. *See, e.g.* Exhibits G1-G24, G101 at 1[c], 1[d]. Additionally, it was well-known to receive signaling information from a base wireless communication terminal. *See, e.g.*, Exhibits G1-G24, G101 at 1[e]. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the '163 patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from

around the world. The '163 patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

H. U.S. Patent No. 11,700,597

Pursuant to Rule 3-3(d), Defendants hereby identify grounds of invalidity for the '597 patent based on lack of written description under 35 U.S.C. § 112 (a); lack of enablement under 35 U.S.C. § 112 (a); indefiniteness under 35 U.S.C. § 112 (b); and indefiniteness under 35 U.S.C. § 112 (f). These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed, or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or non-infringement positions in lieu of, or in addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Plaintiff's purported construction of the claim language or of other positions advanced by Plaintiff during the course of this litigation. Defendants' invalidity contentions under 35 U.S.C. § 112 may depend, in part, on the Court's claim construction, as well as Plaintiff's alleged scope of the '597 patent Asserted Claims. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

1. Lack of Written Description and/or Enablement Under 35 U.S.C. § 112 (a)

The '597 patent does not provide sufficient written description to establish that the inventors were in possession of the alleged inventions recited in the '597 patent Asserted Claims at the time the '597 patent was filed. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). In other words, the applicants did not describe their purported inventions in a manner that “reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.* One of ordinary skill in the art would not have

understood that the inventors were in possession of the full scope of the claimed apparatus and methods.

The specification of the '597 patent also does not enable one of ordinary skill in the art to make and/or use certain recited elements of the '597 patent Asserted Claims without undue experimentation. To the extent the following limitations are definite (under 35 U.S.C. § 112 (b)), the application that became the '597 patent fails to sufficiently describe or enable them as required by 35 U.S.C. § 112 (a):⁵⁶

Term	Relevant Claim(s)
“wherein the processor is configured to receive a physical layer convergence procedure (PLCP) Protocol Data Unit (PPDU) by using the transceiver,”	1-8
“wherein the processor is configured . . . not to use a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed,”	1-8
“wherein the BSS color is an identifier of a BSS,”	1-16
“wherein the signaling information is transmitted from a base wireless communication terminal to which the wireless communication terminal is associated.”	1-16
“wherein the processor is configured not to set an Intra-BSS Network Allocation Vector (NAV) by using the BSS color indicated by a signaling field of the PPDU when the signaling information indicates that the operation based on the BSS color is not allowed,”	2, 3
“wherein the Intra-BSS NAV is different from a Basic NAV and is a NAV which is set based on an Intra-BSS PPDU,”	2, 3, 10, 11
“wherein the Basic NAV is set based on an Inter-BSS PPDU or a PPDU which is not able to be identified as the Inter-BSS PPDU or the Intra-BSS PPDU.”	2, 3, 10, 11
“wherein the PPDU includes a TXOP Duration field in the signaling field of the PPDU and a medium access control (MAC) frame which includes a duration field,”	3, 11
“wherein the TXOP Duration field indicates information used for setting the Intra-BSS NAV and the Basic NAV,”	3, 11
“wherein the duration field indicates information used for setting the Intra-BSS NAV and the Basic NAV,”	3, 11

⁵⁶ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
“wherein the processor is configured not to use the TXOP Duration field for setting the Intra-BSS NAV or the Basic NAV when the wireless communication terminal gets a valid signaling field of the MAC frame.”	3
“wherein the processor is configured to signal that the operation based on the BSS color is not allowed when the wireless communication terminal recognizes that a BSS color collision has occurred,”	4, 5
“wherein the BSS color collision represents that different BSSs correspond to one BSS color.”	4, 5, 12, 13
“wherein the processor is configured to determine that BSS color collision has occurred based on address fields of a medium access control (MAC) frame.”	5
“wherein the operation based on the BSS color includes entering a doze state of a power save operation based on a BSS color indicated by a signaling field of the PPDU,”	6, 14
“wherein the power save operation is an operation for the wireless communication terminal to enter the doze state until an end of a received PPDU which is an Intra-BSS PPDU.”	6, 14
“wherein the processor is configured not to perform a spatial reuse operation when the BSS color indicated by a signaling field of the PPDU is a predetermined value.”	7, 8
“wherein the predetermined value is 0.”	8, 16
“receiving a physical layer convergence procedure (PLCP) Protocol Data Unit (PPDU);”	9-16
“not using a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed,”	9-16
“wherein the method further comprises not setting an Intra-BSS Network Allocation Vector (NAV) by using the BSS color indicated by a signaling field of the PPDU when the signaling information indicates that the operation based on the BSS color is not allowed,”	10, 11
“wherein the method further comprises not using the TXOP Duration field for setting the Intra-BSS NAV or the Basic NAV when the wireless communication terminal gets a valid signaling field of the MAC frame.”	11
“wherein the method further comprises signal that the operation based on the BSS color is not allowed when the wireless communication terminal recognizes that a BSS color collision has occurred,”	12, 13
“wherein the signaling that a BSS color collision has occurred comprises determining that BSS color collision has occurred based on address fields of a medium access control (MAC) frame.”	13

Term	Relevant Claim(s)
“wherein the method further comprises not performing a spatial reuse operation when the BSS color indicated by a signaling field of the PPDU is a predetermined value.”	15, 16

2. Indefiniteness Under 35 U.S.C. § 112 (b)

Under § 112 (b), “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” *Id.* A patent is indefinite under § 112 (b) “if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Several of the ’597 patent Asserted Claims are invalid because they fail to inform those skilled in the art about the scope of the invention with reasonable certainty and are indefinite under § 112 (a), for failing to particularly point out and distinctly claim the subject matter the applicants regard as their invention.

The following limitations recited in the ’597 patent Asserted Claims are indefinite in whole, in part or in combination:⁵⁷

Term	Relevant Claim(s)
“wherein the processor is configured to receive a physical layer convergence procedure (PLCP) Protocol Data Unit (PPDU) by using the transceiver,”	1-8
“wherein the processor is configured . . . not to use a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed,”	1-8
“wherein the BSS color is an identifier of a BSS,”	1-16
“wherein the signaling information is transmitted from a base wireless communication terminal to which the wireless communication terminal is associated.”	1-16
“wherein the processor is configured not to set an Intra-BSS Network Allocation Vector (NAV) by using the BSS color	2, 3

⁵⁷ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
indicated by a signaling field of the PPDU when the signaling information indicates that the operation based on the BSS color is not allowed,”	
“wherein the Intra-BSS NAV is different from a Basic NAV and is a NAV which is set based on an Intra-BSS PPDU,”	2, 3, 10, 11
“wherein the Basic NAV is set based on an Inter-BSS PPDU or a PPDU which is not able to be identified as the Inter-BSS PPDU or the Intra-BSS PPDU.”	2, 3, 10, 11
“wherein the PPDU includes a TXOP Duration field in the signaling field of the PPDU and a medium access control (MAC) frame which includes a duration field,”	3, 11
“wherein the TXOP Duration field indicates information used for setting the Intra-BSS NAV and the Basic NAV,”	3, 11
“wherein the duration field indicates information used for setting the Intra-BSS NAV and the Basic NAV,”	3, 11
“wherein the processor is configured not to use the TXOP Duration field for setting the Intra-BSS NAV or the Basic NAV when the wireless communication terminal gets a valid signaling field of the MAC frame.”	3
“wherein the processor is configured to signal that the operation based on the BSS color is not allowed when the wireless communication terminal recognizes that a BSS color collision has occurred,”	4, 5
“wherein the BSS color collision represents that different BSSs correspond to one BSS color.”	4, 5, 12, 13
“wherein the processor is configured to determine that BSS color collision has occurred based on address fields of a medium access control (MAC) frame.”	5
“wherein the operation based on the BSS color includes entering a doze state of a power save operation based on a BSS color indicated by a signaling field of the PPDU,”	6, 14
“wherein the power save operation is an operation for the wireless communication terminal to enter the doze state until an end of a received PPDU which is an Intra-BSS PPDU.”	6, 14
“wherein the processor is configured not to perform a spatial reuse operation when the BSS color indicated by a signaling field of the PPDU is a predetermined value.”	7, 8
“wherein the predetermined value is 0.”	8, 16
“receiving a physical layer convergence procedure (PLCP) Protocol Data Unit (PPDU);”	9-16
“not using a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed,”	9-16
“wherein the method further comprises not setting an Intra-BSS Network Allocation Vector (NAV) by using the BSS color	10, 11

Term	Relevant Claim(s)
indicated by a signaling field of the PPDU when the signaling information indicates that the operation based on the BSS color is not allowed,”	
“wherein the method further comprises not using the TXOP Duration field for setting the Intra-BSS NAV or the Basic NAV when the wireless communication terminal gets a valid signaling field of the MAC frame.”	11
“wherein the method further comprises signal that the operation based on the BSS color is not allowed when the wireless communication terminal recognizes that a BSS color collision has occurred,”	12, 13
“wherein the signaling that a BSS color collision has occurred comprises determining that BSS color collision has occurred based on address fields of a medium access control (MAC) frame.”	13
“wherein the method further comprises not performing a spatial reuse operation when the BSS color indicated by a signaling field of the PPDU is a predetermined value.”	15, 16

Furthermore, Section 112 (f) allows a patentee to express a claim element “as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.” 35 U.S.C. § 112, ¶ 6. For such claims, the written description of the patent must disclose with sufficient particularity the corresponding structure for performing the claimed function, and it must clearly link that structure to the claimed function. *Ibormeith IP, LLC v. Mercedes-Benz USA, LLC*, 732 F.3d 1376, 1379 (Fed. Cir. 2013). Several of the ’597 patent Asserted Claims are invalid as indefinite because they contain means-plus-function terms subject to Section 112 (f), and the ’597 patent fails to disclose with sufficient particularity the corresponding structure for performing the claimed function.

The following limitations recited in the ’597 patent Asserted Claims are governed by Section 112 (f) and are indefinite in whole, in part or in combination:⁵⁸

⁵⁸ Listed claims also include all Asserted Claims dependent thereon, even if those claims are not individually listed.

Term	Relevant Claim(s)
“wherein the processor is configured to receive a physical layer convergence procedure (PLCP) Protocol Data Unit (PPDU) by using the transceiver, and not to use a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed,”	1-8

3. Invalidity Under 35 U.S.C. § 101

Pursuant to the Court’s Standing Order, Defendants contend that the ’597 patent’s Asserted Claims are invalid under 35 U.S.C. § 101 because the claims are not directed to patent-eligible subject matter. Defendants’ contentions that the Asserted Claims are invalid under 35 U.S.C. § 101 do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Claims, or that any of the claims of the ’597 patent are not anticipated or rendered obvious by prior art.

All Asserted Claims of the ’597 patent are invalid under 35 U.S.C. § 101 because they fail to claim patent-eligible subject matter. The Asserted Claims are directed to the abstract idea of disallowing operation on the basis of a group identifier. The claims recite a related abstract concept of recognizing an identifier collision/contention. The Asserted Claims, however, fail to describe anything beyond the abstract idea of disallowing operation on the basis of a group identifier. None of the remaining claim elements, considered individually or as an ordered combination, transform the nature of the claims into patent-eligible subject matter. To the extent structure is claimed in any of the claims, that structure is nothing more than general purpose computer components performing general purpose computer functions. Such general-purpose structure is insufficient to transform the nature of the claims into patent-eligible subject matter.

Further detail regarding Samsung’s contentions that the Asserted Claims of the ’597 patent do not qualify as patent-eligible subject matter are contained in Exhibit H101. Specifically,

pursuant to section (a)(1) of the Order Regarding Eligibility, Exhibit H101 contains a chart identifying each exception to eligibility to which each Challenged Claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit H101, each Challenged Claim of the '597 patent is directed to an abstract idea and therefore is not directed to patent eligible subject matter. Also, pursuant to section (a)(2)(B) and (a)(3) of the Order regarding Eligibility, Exhibit H101, which references and incorporates information from Exhibits H1-H24, read in conjunction with the preceding paragraphs herein provides: (i) a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the Challenged Claims are otherwise ineligible for patent protection.

Finally, pursuant to section (a)(2)(A) of the Order Regarding Eligibility, Samsung provides the following description of the relevant industry at the relevant time. As of the alleged priority date for the '597 patent (March 4, 2016), the relevant industry was well-developed. Wireless telecommunications—including Wi-Fi—had been around for decades. Further, all individual elements disclosed and recited in the '597 patent were conventional, routine, and well-known in the industry. *See generally* Exhibits H1-H24. By way of example, wireless communication terminals (*e.g.*, stations, wireless devices, etc.) were well-known. *See, e.g.*, Exhibits H1-H24, H101 at 1[pre]. Both transceivers and processors were also well-known. *See, e.g.*, H1-H24, H101 at 1[a], 1[b]. Further, receiving a physical layer protocol data unit (“PPDU”) and not performing a BSS color-based operation when received signaling information indicates the operation is not allowed was well-known. *See, e.g.* Exhibits H1-H24, H101 at 1[c], 1[d]. Additionally, it was well-known to receive signaling information from a base wireless communication terminal. *See,*

e.g., Exhibits H1-H24, H101 at 1[e]. Indeed, none of these concepts was new or merely on the verge of development as of the alleged priority date of the '597 patent. Instead, these concepts had been known for years and were the subject of many published articles and/or patents from around the world. The '597 patent contributed nothing beyond what was already conventional, routine, well-known technology as of the relevant time period.

VII. P.R. 3-4 Production

In connection with these Invalidity Contentions, Defendants also hereby provide the documents required by P.R. 3-4. *See* PRIOR_ART_00000001-PRIOR_ART_00020788. Pursuant to P.R. 3-4(a), Defendants produce and/or make available for inspection documents, source code, and other materials sufficient to show the operation of any aspects or elements of the Accused Products identified by Plaintiff in its P.R. 3-1(c) charts. Defendants also identify third party supplier documents, source code, and other materials not in their possession as responsive to Plaintiff's allegations in its P.R. 3-1(c) charts. In addition, Samsung will make available source code for inspection pursuant to Paragraphs 8 and 10 of the Protective Order, with proper notice of Plaintiff's intent to inspect.

Pursuant to P.R. 3-4(b), Defendants also produce a copy of each item of prior art identified herein. These prior art references and corroborating evidence are cited in attached invalidity claim charts in Appendices A-H. Defendants will also make available for inspection any prior art systems or devices upon request to the extent Defendants acquire such systems or devices. References that were cited during prosecution of the Asserted Patents may not be contained in Defendants' production as they are not required to be under the local patent rules. Defendants' search for prior art references, additional documentation, and/or corroborating evidence concerning prior art systems and devices is ongoing. Accordingly, Defendants reserve the right to

supplement their production as Defendants obtain additional prior art references, documentation, and/or corroborating evidence concerning invalidity during the course of discovery.

Date: February 13, 2025

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing document has been served on February 13, 2025, to all counsel of record via e-mail.

/s/ Ralph A. Phillips _____