

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS, AT&T SERVICES,
INC., T-MOBILE USA, INC., GOOGLE LLC, ERICSSON, INC., AND NOKIA
OF AMERICA CORPORATION.

Petitioners,

v.

KT CORPORATION (PATENT OWNER) AND
PEGASUS WIRELESS INNOVATION LLC (EXCLUSIVE LICENSEE),
Patent Owner.

U.S. PATENT NO. 10,181,931

Title: METHOD FOR UPLINK CONTROL CHANNEL RESOURCE
ALLOCATION OF TERMINAL AND APPARATUS THEREOF

Inter Partes Review No.: IPR2025-00138

**PETITIONERS' REPLY TO PATENT OWNER'S PRELIMINARY
RESPONSE TO PETITION**

TABLE OF AUTHORITIES

Regulatory Cases

<i>BMW of No. Am., LLC, v. Northstar Systems LLC</i> , IPR2023-01017, Paper 12 at 10 (P.T.A.B. Dec. 8, 2023)	5
<i>Sotera Wireless, Inc. v. Masimo Corporation</i> , IPR2020-01019, Paper 12 (P.T.A.B. Dec. 1, 2020)	5

Petitioners' Exhibit List

<i>Exhibit #</i>	<i>Description</i>
1001	U.S. Patent No. 10,181,931 (the “’931 Patent”)
1002	Prosecution history of the ’931 Patent (“File History”)
1003	Declaration of Petitioners’ Expert
1004	U.S. Patent No. 11,470,619 (“Lee”)
1005	U.S. Provisional Application No. 61/863,328 (“Lee ’328”)
1006	International Patent Publication WO 2014/048487 (“Zhang”)
1007	3GPP TS 36.213 v.11.3.0 (“36.213”)
1008	ZTE, “Discussion on Repetition for Control Channel and Traffic Channel”, R1-133062, 3GPP TSG RAN WG1 Meeting #74 (August 2013) (“ZTE”)
1009	U.S. Publication No. 2014/0105191 (“Yang”)
1010	U.S. Publication No. 2016/0127952 (“You”)
1011	Certified Translation of U.S. Provisional Application No. 61/843,456 (“You ’456”)
1012	Certified Translation of International Patent Publication WO 2013/027963 (“Kim”)
1013	International Patent Publication WO/2014/204128 (“You PCT”)
1014	International Patent Publication WO/2015/021318 (“Lee PCT”)
1015	Curriculum Vitae of Petitioner’s Expert Dr. Mark Lanning
1016	3GPP TS 36.211 v.11.4.0 (“36.211”)
1017	U.S. Provisional Application No. 61/843,456
1018	International Patent Publication WO/2014/204128
1019	International Patent Publication WO 2013/027963
1020	3GPP TS 36.212 v.11.3.0 (“36.212”)
1021	U.S. Patent Application Publication No. 2014/0098761 (“Lee ’761”)

<i>Exhibit #</i>	<i>Description</i>
1022	U.S. Provisional Application No. 61/843,456
1023	International Patent Publication WO 2013/027963
1024	<i>Pegasus Wireless Innovation LLC. v. Verizon Communications Inc. et al.</i> , No. 2:23-cv-00640 (E.D. Tex) Dkt. 150
1025	<i>Pegasus Wireless Innovation LLC. v. Verizon Communications Inc. et al.</i> , No. 2:23-cv-00640 (E.D. Tex) Dkt. 68
1026	<i>Pegasus Wireless Innovation LLC. v. Verizon Communications Inc. et al.</i> , No. 2:23-cv-00640 (E.D. Tex) Dkt. 16

The Petition demonstrates how the prior art references disclose the claimed “structural information” and that the start offset information for an MTC terminal is configured separated from start offset information for a terminal different from the MTC terminal. Patent Owner’s (“PO”) arguments to the contrary fail.

I. Structural information

PO’s entire argument is based on a strawman, i.e., Petitioners fail to provide a claim construction that identifies “what is meant by the claimed requirement to receive ‘structural’ information.” POPR, 12. The POPR contradicts PO’s argument admitting that “Patent Owner submits that the Board *need not engage in any pre-institution claim construction.*” *Id.*, 9 (emphasis added).

The Challenged Claims require the “structural information” to contain “at least one of i) information on a resource allocated to an uplink control channel for transmitting the response information and ii) start offset information on the resource allocated to the uplink control channel.” EX-1001, cls. 1, 3, 5, 7. The ’931 Patent does not define or limit the scope of “structural information” and merely discloses that the “structural information” is transmitted/received through higher-layer signaling (e.g., RRC). EX-1001, 11:43-45, 11:56-58, 11:63-12:3.

In addition to demonstrating how a UE determines the PUCCH resources using a starting offset in prior art versions of the 3GPP technical specification, the Petition demonstrates how You, Kim, and Zhang all disclose receiving/transmitting

structural information in the same way as disclosed in the '931 Patent.¹ Pet., 10 (discussing TS 36.213 disclosing UE determining PUCCH resource by utilizing a starting offset), 21-22 (describing how You discloses the BS generating and the terminal using the PUCCH resource $N_{PUCCH}^{(1)}$ configured by higher layer signaling), 22-24 (describing how Kim discloses how $N_{PUCCH}^{(1)}$ or *absolute start location* is used as a start offset by a terminal), 49-50 (describing how Lee discloses receiving a configuration parameter and Zhang discloses $N_{UE-PUCCH}^{(1)}$ and k , which is a dynamic offset modifier). Thus, each of the references describe “structural information that contains at least one of i) information on a resource allocated to an uplink control channel for transmitting the response information **and** ii) start offset information on the resource allocated to the uplink control channel,” as contemplated by the '931 Patent.

¹ Petitioners note that “structural information” is at least encompassed by the resource allocation information pertaining to uplink and downlink channels as cited in the Petition and disclosed in the prior art because the resource allocation information pertains to a structure and/or configuration of the uplink/downlink frames/subframes. Pet., 21-24, 48-50 (“configuration parameter” of Lee). EX-1005, ¶59 (“The uplink and downlink subframes may be configured, e.g., via higher layer signaling.”). EX-1010, ¶55 (“Radio Frame Structure”), ¶58, Fig. 2.

The POPR does not identify how or why the disclosure of a BS transmitting and/or a terminal receiving the information on a resource allocated to an uplink control channel (e.g., k) and start offset information (e.g., $N_{PUCCH}^{(1)}$) in the same manner as disclosed by the '931 Patent fails to disclose the transmitting/receiving of structural information as claimed. Instead, the POPR apparently relies on an overly narrow, but otherwise unspecified, definition of structural information. Thus, contrary to the assertions in the POPR, the Petition demonstrates how the prior art references disclose the claimed structural information, as well as how such information is transmitted and received.

II. You and Kim disclose separately configuring start offset information

The POPR alleges the Petition fails to demonstrate that the prior art references disclose “wherein the offset information of the resource allocated to the uplink control channel is configured separated from start offset information for a terminal different from the MTC terminal.” POPR, 13. However, the POPR ignores the disclosures in the Petition demonstrating that it was known to configure separately the uplink communication control channels for UEs and MTCs. Pet., 12-13 (citing EX-1003 ¶¶ 54-57). As discussed below, the Petition further demonstrates how the prior art of Ground 1 discloses these claim elements.

Specifically, both You and Kim disclose that the PUCCH resource is determined using an equation that includes $N_{PUCCH}^{(1)}$ and n_{CCE} , which is the number

of the first CCE used for transmission of the PDCCH. Pet., 19, 26-27 (discussing element [1.5], including the use of “the start offset information on the resource allocated to the uplink control channel” to determine the resource allocated to the uplink control channel).

With respect to element [1.6], the Petition demonstrates that You discloses different operation techniques for UEs and MTCs, including different search spaces, i.e., different CSS regions of the PDCCH. Pet., 28-29. The Petition then explains that, because the UEs and MTCs have different search spaces, they will have different CCEs. *Id.* Different CCEs correspond to different nCCE values, which are used in the equations disclosed by You and Kim (and the '931 Patent) to determine the resource allocated to the uplink control channel. Accordingly, You discloses that MTCs and UEs are configured separated from one another, including having separate resources on an uplink control channel and different start offsets.

Kim expressly discloses configuring dynamic uplink control channel (PUCCH) resources in a way that is UE-specific by transmitting PUCCH resource index offset values, i.e., start offset information, separate from cell-specific values (e.g., $N_{PUCCH}^{(1)}$). Pet., 17-18, 29 (citing EX-1012 ¶ 117). The Petition further demonstrates that one of ordinary skill in the art would have thought it obvious to configure the start offset information of the resource allocated to the uplink control channel for an MTC terminal separated from start offset information for a terminal

different from the MTC terminal. Pet., 19-20, 28-29. Specifically, You expressly discloses separately configuring uplink control channel resources for MTCs and UEs, Kim discloses providing UE-specific start offsets for uplink control channels to improve efficient transmission/reception of uplink communications, and one of ordinary skill in the art would have thought it obvious to combine the teachings of the references to use separate start offsets when configuring uplink control channels for MTCs and UEs to improve communication efficiency. Pet., 19-20, 27-29. Thus, the Petition demonstrates how the combination of You and Kim disclose element [1.6], which analysis also is applicable to elements [3.5], [5.4], and [7.4].

III. Stipulation / *Fintiv*

PO's *Fintiv* arguments fail at least due to the number of district court cases and the fact that trial dates have not been set for two of the three cases. Moreover, compelling merits support institution. Petitioners also present a *Sotera* stipulation. To mitigate any duplication concerns, if this IPR is instituted, Petitioners will not pursue in District Court litigation the specific grounds asserted in this proceeding, or any other ground that was raised or could have been reasonably raised in an IPR. *See Sotera Wireless, Inc. v. Masimo Corporation*, IPR2020-01019, Paper 12 (P.T.A.B. Dec. 1, 2020) (precedential). Such a stipulation prior to institution is entirely proper. *See BMW of No. Am., LLC, v. Northstar Systems LLC*, IPR2023-01017, Paper 12 at 10 (P.T.A.B. Dec. 8, 2023).

Respectfully submitted,

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CERTIFICATION OF SERVICE ON PATENT OWNER

Pursuant to 37 C.F.R. §§42.6(e), 42.8(b)(4) and 42.105, the undersigned certifies that on May 28, 2025, a complete and entire copy of this **Petitioners' Reply to Patent Owner's Preliminary Response to the Petition** was served in its entirety via filing through the Patent Trial and Appeal Case Tracking System (P-TACTS), as well as by delivering copies via electronic mail to the following:

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