

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS INC.

Petitioner,

v.

PANTECH WIRELESS, LLC

Patent Owner.

Case IPR2023-01270

U.S. Patent No. 10,869,247

PETITION FOR *INTER PARTES* REVIEW

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EXHIBIT LIST

Exhibit ("Ex.")	Description
1001	U.S. Patent No. 10,869,247 ("247")
1002	File History of U.S. Application No. 17/008,439 ("247FH")
1003	Declaration of Dr. Daniel van der Weide in Support of Petition for <i>Inter Partes</i> Review of U.S. Patent No. 10,869,247 ("Weide")
1004	Declaration of Friedhelm Rodermund in Support of Petition for <i>Inter Partes</i> Review of U.S. Patent No. 9,854,545 ("Rodermund")
1005	R1-03-0285, <i>Signalling for H-ARQ Operation</i> ("Lucent")
1006	U.S. Patent Application Publication No. 2004/0223507 ("Kuchibhotla")
1007	U.S. Patent Application Publication No. 2005/0048920 ("Liu")
1008	U.S. Patent No. 6,359,877 ("Rathonyi")
1009	U.S. Patent Application Publication No. 2003/0076783 ("Das")
1010	U.S. Patent Application Publication No. 2004/109433 ("Khan")
1011	U.S. Patent Application Publication No. 2003/210669 ("Vayanos")
1012	File History of U.S. Application No. 10/962,720
1013	File History of U.S. Application No. 11/434,330
1014	File History of U.S. Application No. 13/308,950
1015	File History of U.S. Application No. 13/908,242
1016	File History of U.S. Application No. 14/869,313

Exhibit ("Ex.")	Description
1017	File History of U.S. Application No. 15/699,418
1018	File History of U.S. Application No. 16/283,407
1019	File History of U.S. Application No. 16/545,398
1020	Joint Claim Construction and Prehearing Statement, <i>Pantech Corp. et al. v. LG Electronics Inc. et al.</i> , Case 5:22-cv-00113-RWS-JBB (E.D. Texas), Dkt. No. 118.
1021	Claim Construction Expert Report of Peter Rysavy Concerning U.S. Patent No. 9,854,545, <i>Pantech Corp. et al. v. LG Electronics Inc. et al.</i> , Case 5:22-cv-00113-RWS-JBB (E.D. Texas) (June 23, 2023).
1022	Pantech's Preliminary Infringement Contentions of U.S. Patent No. 10,869,247
1023	Third Amended Docket Control Order, <i>Pantech Corp. et al. v. LG Electronics Inc. et al.</i> , Case 5:22-cv-00113-RWS-JBB (E.D. Texas), Dkt. No. 98
1024	Docket Navigator "Time to Trial" report for Judge Robert W. Schroeder
1025	USCourts.gov "U.S. District Court – Judicial Caseload Profile" for Eastern District of Texas
1026	Claim Construction Memorandum Opinion and Order, <i>Pantech Corp. v. OnePlus Tech. (Shenzhen) Co., Ltd.</i> , No. 22-cv-00069-RWS-JBB, Dkt. No. 51 (E.D. Tex. Aug. 8, 2023)
1027	Declaration of Jonathan Bradford in Support of Petition for <i>Inter Partes</i> Review of United States Patent No. 10,869,247
1028–50	[Reserved]
1051	Webpage, available at https://archive.org/legal/affidavit.php

Exhibit ("Ex.")	Description
1052	Internet Archive Capture, available at https://web.archive.org/web/20020126155238/http://www.3gpp.org:80/TB/home.htm
1053	Internet Archive Capture, available at https://web.archive.org/web/20021201115542/http://www.3gpp.org/
1054	Internet Archive Capture, available at https://web.archive.org/web/20021225100542/http://www.3gpp.org/TB/RAN/RAN1/RAN1.htm
1055	Internet Archive Capture, available at https://web.archive.org/web/20021225085437/http://www.3gpp.org/ftp/tsg_ran/WG1_RL1/
1056	Internet Archive Capture, available at https://web.archive.org/web/20030310074828/http://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_31/
1057	Excel file "work_plan_3gpp_020926.xls," retrieved from https://web.archive.org/web/20060625054352/http://www.3gpp.org/ftp/Information/WORK_PLAN/older_versions/work_plan_3gpp_020926.zip
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1059	Webpage, available at https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_31/Docs/Zips

Exhibit ("Ex.")	Description
1060	R1-03-0285, retrieved from https://list.etsi.org/scripts/wa.exe?A3=ind0302&L=3GPP_TSG_RAN_WG1&E=base64&P=13236608&B=-----090504090304090107000407&T=application%2Fzip;%20name=%22R1-03-0285-signaling%20for%20HARQ.zip%22&N=R1-03-0285-signaling%20for%20HARQ.zip&X=OD369BF41AE3BADE7C1&Y=friedhelm.rodermund%40iotecc.com (R1-03-0285-signaling for HARQ.doc in R1-03-0285-signaling for HARQ.zip)
1061	Webpage, available at https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_RAN_WG1;db5ce98d.0302&S=
1062	Internet Archive Capture, available at https://web.archive.org/web/20021129231250/http://list.etsi.org/
1063	Internet Archive Capture, available at https://web.archive.org/web/20030326234439/http://list.etsi.org/
1064	Webpage, available at https://web.archive.org/web/20030926220033/http://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_31/Docs/Zips/
1065	R1-03-0285, retrieved from http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_31/docs/ZIPS/R1-030285.zip (R1-03-0285-signaling for HARQ.doc in R1-030285.zip)
1066	Tdoc R1-030396, retrieved from https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_31/Report/R1-030396.zip (R1-030396_minutes_31.doc in R1-030396.zip)
1067	Webpage, available at https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_31/Report

Exhibit ("Ex.")	Description
1068	Internet Archive Capture, available at https://web.archive.org/web/20030626230505/http://www.3gpp.org:80/ftp/tsg_ran/WG1_RL1/
1069	Excel file "R1_Index(2003).xls," retrieved from https://web.archive.org/web/20070213231840/http://www.3gpp.org/ftp/tsg_ran/WG1_RL1/R1_Index(2003).zip
1070	Internet Archive Capture, available at https://web.archive.org/web/20030114054451/http://www.3gpp.org:80/tb/home.htm

TABLE OF ABBREVIATIONS

Abbreviation	Description
'247	U.S. Patent No. 10,869,247 (Ex. 1001)
'247FH	File History of U.S. Application No. 17/008,439 (Ex. 1002)
Claims/ Challenged Claims	Claims 1-20 of '247
Das	U.S. Patent Application Publication No. 2003/0076783 (Ex. 1009)
IPR	<i>Inter Partes</i> Review
Kuchibhotla	U.S. Patent Application Publication No. 2004/0223507 (Ex. 1006)
Liu	U.S. Patent Application Publication No. 2005/0048920 (Ex. 1007)
Lucent	R1-03-0285, <i>Signalling for H-ARQ Operation</i> (Ex. 1005)
Petitioner	Petitioner LG Electronics Inc.
PO	Patent Owner Pantech Wireless, LLC
POSITA	Person of Ordinary Skill in the Art
PTAB	Patent Trial and Appeal Board
Rathonyi	U.S. Patent No. 6,359,877 (Ex. 1008)
USPTO	United States Patent and Trademark Office
Weide	Declaration of Dr. Daniel van der Weide in Support of Petition for <i>Inter Partes</i> Review of U.S. Patent No. 10,869,247 (Ex. 1003)

LIST OF CHALLENGED CLAIMS

[1.pre] A wireless transmit/receive unit (WTRU) comprising:

[1.a] at least one transceiver; and

[1.b] a processor;

[1.c] wherein the at least one transceiver and the processor are configured to cause the WTRU to: transmit, using a hybrid automatic repeat request (H-ARQ) process, a data block to a base station;

[1.d] receive uplink scheduling information from the base station, wherein the uplink scheduling information includes a H-ARQ process identification for the H-ARQ process; and

[1.e] determine whether to retransmit the data block based on the received uplink scheduling information and not based on whether the WTRU has received a negative acknowledgement (NACK) from the base station.

[2] The WTRU of claim 1, wherein the at least one transceiver and the processor are further configured to cause the WTRU to, in response to a determination to retransmit the data block, retransmit the data block.

[3] The WTRU of claim 2, wherein the data block is retransmitted using physical channel.

[4] The WTRU of claim 1, wherein the reception of the uplink scheduling information initiates retransmission of a negatively acknowledged (NACK'ed) data block.

[5] The WTRU of claim 1, wherein the uplink scheduling information includes physical channel resources.

[6] The WTRU of claim 1, wherein the uplink scheduling information is received from a primary cell and the WTRU transmits to the primary cell and at least one secondary cell.

[7] The WTRU of claim 1, wherein the at least one transceiver and the processor are further configured to cause the WTRU to receive an ACK/NACK signal from the base station.

[8] The WTRU of claim 1, wherein the scheduling information indicates a modulation and coding scheme.

[9] The WTRU of claim 1, wherein the transmitted data block has a first modulation and coding scheme (MCS) and the scheduling information indicates a second MCS, wherein the first MCS and the second MCS are different.

[10] The WTRU of claim 9, wherein the at least one transceiver and the processor are further configured to cause the WTRU to, in response to a determination to retransmit the data block, retransmit the data block using the second MCS.

[11.pre] A method comprising:

[11.a] transmitting, by a wireless transmit/receive unit (WTRU), a data block to a base station using a hybrid automatic repeat request (H-ARQ) process;

[11.b] receiving, by the WTRU, uplink scheduling information from the base station, wherein the uplink scheduling information includes a H-ARQ process identification for the H-ARQ process; and

[11.c] determining, by the WTRU, whether to retransmit the data block based on the received uplink scheduling information and not based on whether the WTRU has received a negative acknowledgement (NACK) from the base station.

[12] The method of claim 11 further comprising, in response to a determination to retransmit the data block, retransmitting, by the WTRU, the data block.

[13] The method of claim 12, wherein the data block is retransmitted using physical channel resources included in the uplink scheduling information.

[14] The method of claim 11, wherein the reception of the uplink scheduling information initiates retransmission of a negatively acknowledged (NACK'ed) data block.

[15] The method of claim 11, wherein the uplink scheduling information includes physical channel resources.

[16] The method of claim 11, wherein the uplink scheduling information is received from a primary cell and the WTRU transmits to the primary cell and at least one secondary cell.

[17] The method of claim 11 further comprising receiving, by the WTRU, an ACK/NACK signal from the base station.

[18] The method of claim 11, wherein the scheduling information indicates a modulation and coding scheme.

[19] The method of claim 11, wherein the transmitted data block has a first modulation and coding scheme (MCS) and the scheduling information indicates a second MCS, wherein the first MCS and the second MCS are different.

[20] The method of claim 19 further comprising, in response to a determination to retransmit the data block, retransmitting the data block using the second MCS.

Pursuant to §§311-319 and §42.1,¹ LG Electronics Inc. (“Petitioner”) petitions for *inter partes* review (“IPR”) of claims 1-20 (“Claims”) of U.S. Patent No. 10,869,247 (“’247”), assigned to Pantech Wireless, LLC (“PO”). There is a reasonable likelihood—and it is highly likely—that at least one challenged claim is unpatentable as explained herein. Petitioner requests review of the Claims, and judgment finding them unpatentable under §103.

I. INTRODUCTION

The Claims are generally directed to an error-control technique that allows a wireless transmit/receive unit (“WTRU”), such as a mobile phone, to determine whether it needs to retransmit data to a base station when erroneous transmissions occur. ’247, claims 1, 11; Ex. 1003 (“Weide”), ¶29.

In prior art cellular networks, it was well known to control erroneous transmissions using a well-understood technique called hybrid automatic repeat request (H-ARQ). ’247, 1:58-62; Weide, ¶30. H-ARQ generally ensures that transmissions between the WTRU and the base station are properly received, and if

¹ Section cites reference 35 U.S.C. (pre-AIA) or 37 C.F.R. as context indicates. All emphasis/annotations added unless noted. Figure annotations herein generally quote the Claims for reference. Citations herein are exemplary and not meant to be limiting.

not, those transmissions are repeated until they are. *Id.* In a typical H-ARQ system, the base station sent an acknowledgement message (“ACK”) to the WTRU when its transmission was properly received, and a negative acknowledgement message (“NACK”) when the WTRU’s transmission was not properly received, thus signaling to the WTRU to retransmit. ’247, 2:19-20; Weide, ¶30.

However, as the ’247 acknowledges, “problem[s] may arise” for “H-ARQ operation” in certain situations called “handover,” where a WTRU moves between cells that are serviced by different base stations in a cellular network. ’247, 2:4-22; Weide, ¶31. For example, in a hard handover, a WTRU loses access to the source base station in the old cell when it moves to a new cell serviced by a target base station. ’247, 2:4-12, 2:30-48; Weide, ¶31. Thus, if a WTRU retransmits previously NACKed data to an original base station while undergoing handover, those retransmissions may be lost. ’247, 2:30-34. Purporting to reduce this risk, the ’247 discusses prioritizing retransmissions of previously lost or “NACKed” data before a WTRU fully transitions to a new cell and loses access to the old cell. ’247, 7:41-44; 8:3-5. The source base station sends the WTRU an uplink (UL) scheduling message that identifies the previously NACKed data that needs to be retransmitted by, e.g., using a “H-ARQ process identification for the H-ARQ process” corresponding to each prior unsuccessful transmission. ’247, Abstract, 8:10-22. And as the Claims

recite, the WTRU determines whether to retransmit based on uplink scheduling information and “not based on whether the WTRU has received a [NACK] from the base station.” *See, e.g.*, ’247, claims 1, 11.²

But the concept of basing a retransmission decision on uplink scheduling information rather than a NACK was not new. **Lucent** (Ex. 1005) and **Kuchibhotla** (Ex. 1006) both disclose systems that relied on fields in an uplink scheduling information message instead of NACK messages to instruct a UE to retransmit data. **Kuchibhotla** ¶¶62, 71 (determining retransmission based on a “scheduling assignment message” and “ignoring...NACK”); **Lucent** 1, 4-5 (determining retransmission based on whether the “New Data Indicator” field in a “schedule grant message” has changed); **Weide**, ¶32. Nor was it new or non-obvious to use a H-ARQ process identification in an uplink scheduling information message to identify which data to retransmit. For example, **Lucent** and **Liu** (Ex. 1007) both disclose including a H-ARQ process identification in an uplink scheduling information to identify the H-ARQ process to which the scheduling information is directed. **Lucent** 1, 4-5; **Liu** ¶¶25-33; **Weide**, ¶32.

² The Claims are not limited to making such determination during handover between cells.

Accordingly, Petitioner requests that the Board institute trial and find the Claims unpatentable. Weide, ¶33.

II. MANDATORY NOTICES

A. Real Parties-in-Interest

Petitioner LG Electronics Inc., and LG Electronics U.S.A., Inc. are the real parties-in-interest. No other parties had access to or control over the present Petition, and no other party funded or participated in preparation of the present Petition.

B. Related Matters

The '247 is the subject of the following co-pending civil action:

- *Pantech Corporation et al. v. LG Electronics Inc. et al.*, No. 5:22-cv-00113-RWS-JBB (E.D. Tex.) (“LGE Litigation”)
- *Pantech Corporation v. OnePlus Technology (Shenzhen) Co., Ltd.*, No. 5:22-cv-00069 (E.D. Tex.) (“OnePlus Litigation”)

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Petitioner consents to electronic service of documents to the email addresses
of the counsel identified above.

III. PAYMENT OF FEES

The undersigned authorizes the Office to charge the fee required by §42.15(a)
and any additional fees that might be due to Deposit Account No. 18-1945, under
Order No. 104537-0034-657.

IV. REQUIREMENTS FOR *INTER PARTES* REVIEW

A. Grounds for Standing

Pursuant to §42.104(a), Petitioner certifies that the '247 is available for IPR. Petitioner and any real parties-in-interest are not barred or estopped from requesting IPR challenging the claims on the grounds identified herein.

B. Identification of Challenge

Pursuant to §§42.104(b)-(b)(1), Petitioner requests IPR of claims 1-20, and that the Board cancel the same as unpatentable.

1. Specific Art on Which the Challenge Is Based

Petitioner relies on the following prior art (Weide, ¶48):

Name	Ex.	Publication/ Title	Filed	Published/ Issued	Prior art under at least
Lucent	1005	R1-03-0285, <i>Signalling for H- ARQ Operation</i>	N/A	By 2/21/2003 ³	§§ 102(a),(b)
Kuchibhotla	1006	US2004/0223507	5/7/2003	11/11/2004	§§ 102(a),(e)
Liu	1007	US2005/0048920	8/26/2003	3/3/2005	§§ 102(a),(e)
Rathonyi	1008	US6,359,877	7/21/1998	3/19/2002	§§ 102(a),(b)
Das	1009	US2003/0076783	10/19/2001	4/24/2003	§§ 102(a),(e)

³ See Rodermund, ¶¶61-77.

Lucent was publicly accessible to, and accessed by, POSITAs and interested researchers well before the earliest '247 priority date of 11/5/2003.⁴ **Lucent** is a proposal submitted by Lucent to the 3GPP TSG Working Group 1 (WG1). **Lucent**, 1; Ex. 1004 (“Rodermund”), ¶¶1-80. **Lucent** was published and freely available on 3GPP’s ftp server by 2/17/2003.⁵ Rodermund, ¶¶64-73. **Lucent** was also published and disseminated to other 3GPP working group members, through the 3GPP ETSI mailing list on 2/17/2003⁶ (Rodermund, ¶63), and through 3GPP TSG-WG1 meeting #31 in Tokyo, Japan by no later than 2/21/2003 (Rodermund, ¶¶74-76). Weide, ¶48; *see, e.g., Apple et al. v. Uniloc 2017 LLC*, IPR2019-00222, Pap. 28, *13-18; *LG Electronics, Inc. v. Core Wireless Licensing S.A.R.L.*, IPR2015-

⁴ Regardless of whether the Claims are entitled to the 11/5/2003 filing date of the earliest filed provisional application of the '247 (Provisional Application No. 60/517,656), all Claims are invalid based on the grounds set forth in this petition. *See* §IX.

⁵ https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_31/Docs/Zips (Ex. 1059, 4).

⁶ https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_RAN_WG1;db5ce98d.0302&S= (Ex. 1061).

01986, Pap. 34, *26-31; *Samsung Electronics Co., Ltd. v. Ibex PT Holdings Co., Ltd.*, IPR2018-00011, Pap. 33, *4.

2. Statutory Grounds on Which the Challenge Is Based⁷

Ground	Basis	Claims	References
1	§§102/103	1-2, 8, 11-12, 18	Lucent
2	§103	1-2, 8, 11-12, 18	Lucent in view of Liu
3	§103	9-10, 19-20	Lucent in view of Das
4	§103	9-10, 19-20	Lucent in view of Liu and Das
5	§103	1-7, 11-17	Kuchibhotla in view of Liu
6	§103	8, 18	Kuchibhotla in view of Liu and Lucent
7	§103	9-10, 19-20	Kuchibhotla in view of Liu, Lucent, and Das
8-14	§103	See above for corresponding Grounds 1-7	Grounds 1-7 in further view of Rathonyi

V. '247 PATENT AND PROSECUTION HISTORY

A. '247

The Claims are generally directed to a wireless communication technique performed by a WTRU that determines whether to retransmit based on an uplink scheduling message received from the base station, instead of a NACK.

⁷ See Weide, ¶¶49-58.

To identify what data the WTRU needs to retransmit, the base station sends an uplink scheduling message to the WTRU including the relevant information. '247, 8:10-22. For example, “source Node-B 210 uplink scheduler 225 may specify that the scheduled UL transmission is intended for the data blocks that were previously NACKed” by sending a H-ARQ process identification to the WTRU 205. '247, 8:10-18; Figure 2. “By receiving the scheduling information from the source Node-B 210, the WTRU 205 knows that the scheduled transmission is for the specific data associated with the HARQ process identification sent together with the scheduling information.” '247, 8:18-22; Weide, ¶34.

B. Prosecution History

There was no substantive prosecution of the '247 itself. The originally filed claims received a first-action allowance. '247FH (Ex. 1002), 8-17, 173; Weide, ¶35.

VI. §325(D) AND §314(A) DISCRETION DOES NOT APPLY

A. §325(d)

Under the two-part *Advanced Bionics* framework, the Board should not exercise discretion.

The grounds raised by this Petition are not the same or substantially the same as the art and arguments raised during '247's prosecution. As discussed above, there was no substantive prosecution of the '247 application. Nor was there any substantive discussion of any of the references raised in this Petition's grounds

during prosecution of the '247 or any related application in its priority chain. In particular, **Lucent** and **Rathonyi** were never considered during the '247's prosecution. And though the Applicant identified **Liu** and **Kuchibhotla's** disclosure⁸ in information disclosure statements (IDSs) listing hundreds of other references, the Examiner did not substantively discuss these references in any office action rejection during the prosecution of the '247 or any of its ancestors, much less consider any of the disclosures cited by Petitioner in this Petition. *See, e.g.*, '247FH, 34, 35, 148; Weide, ¶35; *Ecobee Techs. v. Causam Enterprises, Inc.*, IPR2022-01339, Pap. 20, *20-21 (declining to exercise §325(d) discretion). The only substantive discussion of prior art occurred during prosecution of related U.S. Patent Nos. 8,130,720 and 7,046,648, which issued from ancestor applications of the '247. *See* Weide, ¶36. But those discussions are irrelevant, because they were directed to different claim features that do not appear in or otherwise impact any of the Challenged Claims. *See, e.g.*, Ex. 1013, 195-97, 216-18, 228-30, 282-84, 291-94, 316-18, 392-94, 410-12, 441-43 (discussing limitations related to, e.g., a "CRC" check and "scheduling information including the maximum transmission power"),

⁸ US7,414,989 (issued from the **Kuchibhotla** publication relied upon in this Petition) was cited in an Applicant-filed IDS. *E.g.*, '247FH, 34.

Ex. 1012, 41-53, 71-73 (discussing limitations related to, e.g., “stor[ing] NACK data packets” and using “soft combining”). As explained below, the Claims are obvious under the identified Grounds. *See* §IX.

Even if the art or arguments relied on herein were considered or substantially the same as those considered, the Examiner erred in a manner material to the patentability of the Claims by not rejecting the Claims over the combinations relied on herein for the reasons discussed in §IX. Here, because the prior art relied on “was not evaluated substantively,” it “weighs in favor” of error. *See Liquidia Techs., Inc. v. United Therapeutics Corp.*, IPR2021-00406, Pap. 18, *19. Moreover, because the Examiner did not issue any rejections based on any of the cited art in this petition it is “impossible ... to determine the consideration the Examiner gave” to any cited reference and, at the second part of *Advanced Bionics*, “the absence of further evidence of the Examiner’s consideration of” the art supports finding that “the Office erred in a manner material to patentability.” *Ecobee*, *20-21.

B. §314(a)

The co-pending litigation also does not warrant exercising discretion under §314(a) based on the *Fintiv* factors.

1: Following institution, Petitioner intends to seek a stay of the LGE Litigation pending the outcome of this IPR.

2: Though the LGE Litigation trial is currently set for 7/29/2024,⁹ based on median time to trial before the presiding judge over the last 5 years, trial is expected 26 months¹⁰ from the 9/2/2022 filing date, in late 11/2024 (median time to trial in the entire district varies between 19 and 24 months).¹¹

3: The LGE Litigation is in its early stages; the court has not ruled on the initial motion to dismiss and discovery has just begun.

4: After the final written decision, the same grounds and arguments could not be presented in the litigation.

5: The litigation and PTAB parties are the same.

6: The merits of this Petition are compelling as shown herein. Indeed, the concept of sending a retransmission based on scheduling information instead of a NACK was well-known in the field. *See* §§I, IX.A.1, IX.D.1.

⁹ Ex. 1023, 1.

¹⁰ Ex. 1024.

¹¹ Ex. 1025.

VII. LEVEL OF ORDINARY SKILL

For purposes of this Petition only, Petitioner assumes the Claims are entitled to the filing date of the earliest provisional application (60/517,656) to which the '247 claims priority—11/3/2003.¹² Weide, ¶37.

A person of ordinary skill in the art (“POSITA”) as of the claimed priority date of the '247 would have had a bachelor’s degree in electrical or computer engineering, computer science, or the equivalent thereof, and at least two years of experience with wireless communication systems. Weide, ¶¶38-41. More education can supplement practical experience, and vice-versa. *Id.*

VIII. CLAIM CONSTRUCTION

Claim terms subject to IPR are construed using *Phillips*. 37 C.F.R. §42.100(b). Only terms necessary to resolve the controversy need construction. Because the prior art asserted herein discloses embodiments within the Claims’ indisputable scope, the Board need not construe the Claims’ outer bounds. All claim

¹² Petitioner disputes that the Claims are entitled to this alleged priority date, but assume this priority date for purposes of only this Petition because it is immaterial to the Grounds.

terms should be construed according to their plain and ordinary meaning. Weide, ¶¶42-43.

Regardless of whether the preambles are limiting, the prior art discloses the preambles. *See* §IX; Weide, ¶44.

Though claims 1, 2, and 10 recite a “transceiver” and “processor” and functions performed by “at least one transceiver and the processor” (*see* limitations [1.a]-[1.e], [2], [10]), none is a means-plus-function limitation covered by §112 ¶6,¹³ and all are disclosed and/or rendered obvious by the prior art for the reasons discussed in §IX. Weide, ¶¶45-47.

If limitation [1.e] were determined to be a means-plus-function term (it is not) and additional specification structure were necessary to meet this limitation,

¹³ E.D. Texas held the claim 1 “processor” is not means plus function. Ex. 1026, 55. Petitioner and PO do not dispute that all limitations of the Claims should be construed according to their plain and ordinary meaning. Neither party has proposed any terms for construction for the ’247 patent in the LGE Litigation. *See* Ex. 1020. Moreover, at minimum, limitations [1.c], [1.d], [2], and [10] are all performed by a transceiver, which connotes sufficient structure and thus are not means-plus-function limitations. Weide, ¶46.

Petitioner identifies the corresponding structure and equivalents, and the function of this limitation as disclosed by the '247 in compliance with §42.104(b)(3), as summarized in the table below. Weide, ¶45.

Limitation (function emphasized)	Structure
[1.e]: “the processor [] configured to <i>cause the WTRU to:... determine whether to retransmit the data block based on the received uplink scheduling information and not based on whether the WTRU has received a negative acknowledgement (NACK) from the base station</i> ”	processor in a WTRU (e.g., 3:25-28) implementing an algorithm (e.g., 8:10-22)

Under this construction, limitation [1.e] is still disclosed and/or rendered obvious, literally and/or under the doctrine of equivalents by the processor in **Lucent’s** UE (alone or in view of **Liu**) and **Kuchibhotla’s** MS (in view of **Liu**), by performing substantially the same functions (see those listed above) in substantially the same way (see table below), to achieve substantially the same result (see table below), as discussed in §IX. Weide, ¶47.

Limitation	DOE
[1.e]	Function: see table above Way: e.g., determine whether to retransmit a data block based on uplink scheduling information identifying information about a prior failed transmission, where the retransmission determination is not based on whether or not a NACK was received by the WTRU (e.g., 8:10-22) Result: e.g., a determination is made as to whether to retransmit the data block (e.g., 8:10-22)

IX. GROUNDS OF UNPATENTABILITY

This Petition is supported by the Declaration of Dr. Daniel van der Weide, which describes the prior art's scope and content at the time of and well before the '247. *See* Ex. 1003. The prior art renders the Claims unpatentable based on the below Grounds. Weide, ¶¶1-58.

A. Ground 1: Lucent (Claims 1-2, 8, 11-12, 18)

1. Overview of Lucent

Lucent, titled “Signalling for H-ARQ Operation,” proposes efficient ways to schedule uplink transmissions from a “UE” to a “Node-B” in “asynchronous H-ARQ operation.” Lucent, 1, Figs. 1-2; Weide, ¶59. For example, in “Node-B controlled scheduling,” the UE’s uplink transmissions are dictated by information in a “schedule grant message transmitted by the Node-B.” Lucent, 1; Weide, ¶60. The scheduling grant message includes, among other parameters, “HARQ parameters,” including a “H-ARQ channel” identifier, “New Data Indicator (NDI) bit(s),” and “modulation and coding scheme (MCS).” Lucent, 1, 4-5; Weide, ¶¶59-62.

As illustrated in Figure 2 below (annotated), Node-B communicates a tuple “(x, y)” in a schedule grant message to the UE. Lucent, 4-5, Fig. 2; Weide, ¶61. As shown in the legend (annotated in red), the x value represents a HARQ channel number (e.g., 0, 1), and the y value represents the “New Data Indicator” (NDI) value. *Id.* The NDI indicates whether the UE should retransmit a previous packet or a new

data. For example, “if the [NDI] has not changed compared to the value in the previous received transmission of a given H-ARQ process, it implies a NACK.” *Id.* In response, “the UE retransmits the [last] packet” that was sent within the given H-ARQ process. Lucent, 5. The Node-B identifies which prior transmission to retransmit by using a H-ARQ channel identifier (e.g., “H-ARQ channel 0” and “HARQ ch[annel] 1”) to identify the H-ARQ process during which that prior transmission occurred. Lucent, 4-5, Figure 2; Weide, ¶¶59-62.

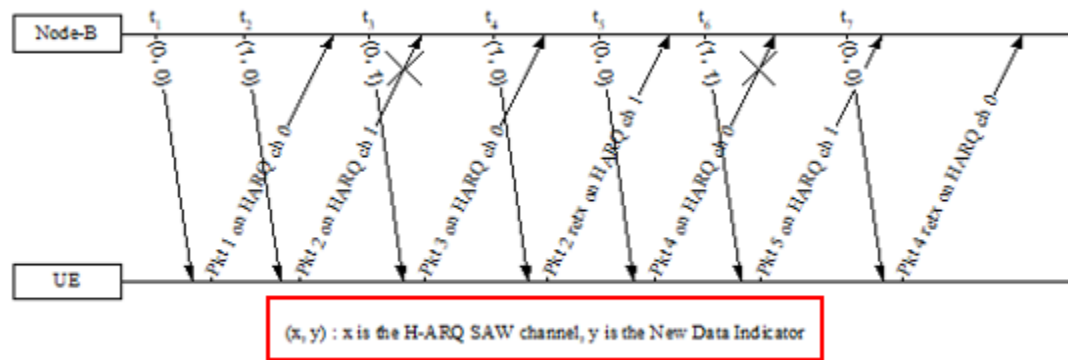


Figure 2. Implicit signalling of H-ARQ ACK/NACKs by Node-B

2. Claim Chart

In addition to §IX.A.1, the following identifies example disclosures followed by bulleted excerpts that each disclose and/or render obvious claims 1-2, 8, 11-12, and 18. Weide, ¶¶63-102.

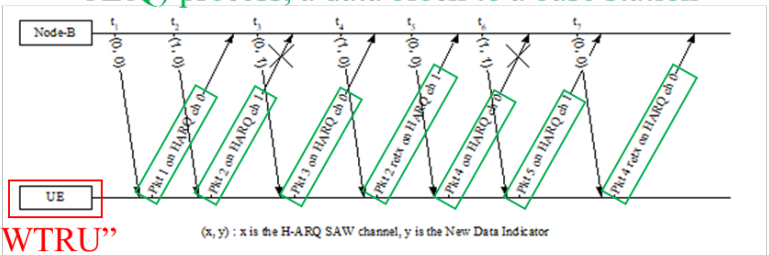
'247 Claims	Lucent
[1.pre] A wireless transmit/receive unit (WTRU) comprising:	Lucent discloses a wireless transmit/receive unit (WTRU) (e.g., “UE” that transmits/receives information wirelessly to/from a “Node-B”). <u>E.g., Lucent:</u> Lucent discloses a “UE” that transmits/receives information to/from a “Node-B.” Lucent 1, 3-5, Fig. 1. Lucent refers to the UE also as “mobile,” scheduled by the “Node-B” for transmission. Lucent 3. Accordingly, Lucent discloses a wireless transmit/receive unit. Weide, ¶¶63-65. Figure 1 (“Data transmission between a UE and the Node-B”) “wireless transmit/receive unit (WTRU)” <pre> sequenceDiagram participant UE participant NodeB as Node-B Note over UE: Data arrives at the UE buffer Note over UE: t1 Note over UE: UE sends buffer status, power margin, and other information to Node-B Note over UE: t2 Note over NodeB: Node-B updates buffer status and power margin information for UE Note over NodeB: Node-B sends schedule grant message to UE, commanding it to transmit at rate R1 Note over NodeB: t3 Note over UE: Buffer status and power margin transmitted in-band with data at rate R1 Note over UE: t4 Note over UE: UE performs a transmission at rate R1 that was commanded by Node-B </pre> Figure 1. Data transmission between a UE and the Node-B. Figure 2 (“Implicit signalling of H-ARQ ACK/NACKs by Node-B”)

'247 Claims	Lucent
	(x, y) : x is the H-ARQ SAW channel, y is the New Data Indicator Figure 2. Implicit signalling of H-ARQ ACK/NACKs by Node-B “wireless transmit/receive unit (WTRU) ” • 1 (“§2.1 Node-B controlled scheduling[:] Here, <i>the UE’s uplink transmission is in response to a schedule grant message transmitted by the Node-B.</i>”) • 3 (“An example of <i>data transmission between a UE and a Node-B</i> in this case is shown in Figure 1... <i>After receiving the buffer status and power margin information, the Node-B decides to schedule the mobile</i> and sends the scheduling grant at time t_3. At time t_4, <i>the UE transmits at the data rate commanded by the Node-B.</i>”) • <i>See also 4-5.</i>
[1.a] at least one transceiver; and	Lucent discloses at least one transceiver (e.g., transceiver of a “UE” or “mobile” for transmitting/receiving information to/from Node-B; <i>see</i> [1.pre]). <u>E.g., Lucent:</u> <i>See</i> [1.pre]. A POSITA would have understood that Lucent’s “UE”/“mobile” includes a transceiver that transmits/receives information to/from the Node-B. <i>See</i> [1.pre]; Weide, ¶¶66-68. At minimum, a POSITA would have found it obvious to implement Lucent’s UE to use a

'247 Claims	Lucent
	transceiver to transmit/receive information to/from a Node-B, because transceivers are used for this purpose. ¹⁴ Weide, ¶68.
[1.b] a processor;	Lucent discloses a processor (e.g., “UE[’s]” processor that determines, e.g., whether to “retransmit[]” a previous packet in a “H-ARQ process” based on the NDI). <u>E.g., Lucent:</u> See [1.pre], [1.c]-[1.e]. As explained in further detail in [1.c]-[1.e], Lucent further discloses that the “UE” detects a “NDI” sent in the “schedule grant message” and determines based on the NDI whether to “retransmit[]” a previous packet in a “H-ARQ process.” Lucent, 4-5; Weide, ¶¶69-71. A POSITA would have understood that Lucent includes a processor to perform these functions, and at minimum, would have found it obvious to use a processor to do so, as processors were known to be used for this purpose.¹⁵ <i>Id.</i>
[1.c] wherein the at least one transceiver and the processor are configured to cause the WTRU to: transmit, using a hybrid automatic repeat request (H-ARQ) process, a	Lucent discloses that the at least one transceiver (see [1.a]) and the processor (see [1.b]) are configured to cause the WTRU (see [1.pre]) to: transmit, using a hybrid automatic repeat request (H-ARQ) process, a data block to a base station (e.g., “UE transmits the first packet”/“data block” on “H-ARQ channel 0” identifying “a given H-ARQ process” “to the Node-B”). <u>E.g., Lucent:</u> See [1.a]-[1.b].

¹⁴ See, e.g., Rathonyi, 1:33-39, 15:64-66, Claim 9, Figure 1.

¹⁵ See, e.g., Rathonyi at 1:33-39, 15:64-66, Claim 9, Figure 1.

'247 Claims	Lucent
data block to a base station;	Lucent further discloses that the UE “transmits” a “first packet” (also referred as “data block”) to a “Node-B.” Lucent, 3-5. The UE makes this “transmission” on a “HARQ channel,” such as “H-ARQ channel 0,” which identifies “a given H-ARQ process.” <i>Id.</i>, 4-5, Figure 2; Weide, ¶¶72-74. A POSITA would have understood, and at minimum found obvious, that Lucent’s transceiver (<i>see</i> [1.a]) working with its processor is configured to cause the UE to transmit data blocks to the Node-B using a H-ARQ process. Weide, ¶75. Figure 2 (“Implicit signalling of <i>H-ARQ</i> ACK/NACKs by Node-B”) “transmit, using a hybrid automatic repeat request (H-ARQ) process, a data block to a base station”  “WTRU” (x, y) : x is the H-ARQ SAW channel, y is the New Data Indicator Figure 2. Implicit signalling of H-ARQ ACK/NACKs by Node-B 4-5 (“[I]f the New Data Indicator has not changed compared to the value in the previous <i>received transmission of a given H-ARQ process</i>, it implies a NACK. Conversely, if the New Data Indicator has changed compared to the value in the previous received <i>transmission of a given H-ARQ process</i>, it implies an ACK... Figure 2 illustrates the method by means of an example. <i>At time t₁, Node-B schedules a transmission on H-ARQ channel 0, with NDI set equal to 0. The UE transmits the first packet in response, which is decoded correctly by the Node-B.</i>”) 3 (“<i>An example of data transmission</i> between a UE and a Node-B in this case is shown in Figure 1. ... Note that the buffer status and power margin information is carried in

'247 Claims	Lucent
	<i>each data block transmitted in response to a schedule grant received from the Node-B.</i> Therefore, when <i>a UE sends data to the Node-B</i>, buffer status and power margin information get updated as well.”) • 1 (“Hybrid ARQ (H-ARQ) was one of the key technologies that led to the significant improvement that HSDPA provided over previous downlink transmission technologies, such as that in Rel ’99....[¶] Certain amount of signalling is necessary for H-ARQ operation. In this contribution, we discuss the signalling that is required for efficient H-ARQ operation.”). • See also 1-2 (§2.1), Figure 1.
[1.d] receive uplink scheduling information from the base station, wherein the uplink scheduling information includes a H-ARQ process identification for the H-ARQ process; and	Lucent discloses that the at least one transceiver (see [1.a]) and the processor (see [1.b]) are configured to cause the WTRU (see [1.pre]) to receive uplink scheduling information from the base station (e.g., “UE” receives a “schedule grant message transmitted by the Node-B”), wherein the uplink scheduling information includes a H-ARQ process identification for the H-ARQ process (e.g., “The schedule grant message contains H-ARQ parameters,” including an “x” value identifying the H-ARQ process occurring on a “H-ARQ channel”). <u>E.g., Lucent:</u> See [1.a]-[1.c]. Lucent further discloses that the UE receives a “schedule grant message transmitted by the Node-B.” Lucent, 4-5, Figure 2. “The schedule grant message contains H-ARQ parameters,” as reflected in an “(x, y)” tuple where “x is the H-ARQ SAW channel,” and “y is the New Data Indicator” (NDI). <i>Id.</i>, 1, 4, Figure 2. The UE uses the “H-ARQ channel” and the NDI value in the “schedule grant message” to determine whether to retransmit a previous transmission in a “given H-ARQ process.” <i>Id.</i>, 4-5, Figure 2; Weide, ¶¶76-79. Thus, the “HARQ channel” that is included in

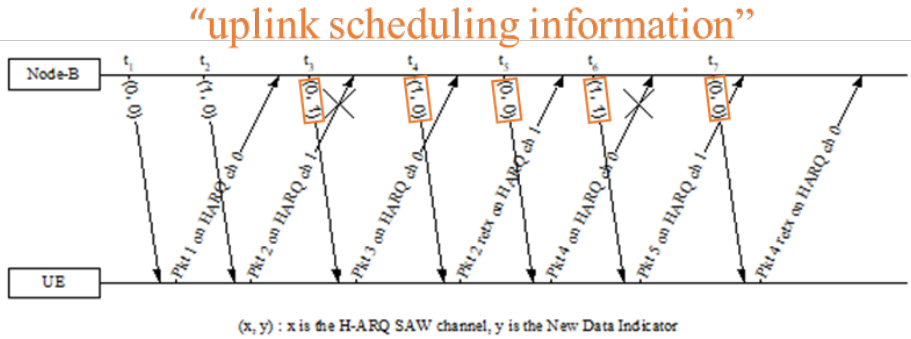
'247 Claims	Lucent
	the “schedule grant message” is a H-ARQ process identification because it identifies which H-ARQ process for which to retransmit a previously transmitted packet. <i>Id.</i>, 4-5, Figure 2; Weide, ¶79. To the extent further disclosure of a H-ARQ process identification is required, it would have at minimum been obvious to implement Lucent’s “x” value representing the H-ARQ channel number to be a H-ARQ process identification. Weide, ¶80. A POSITA would have understood that each H-ARQ channel ID corresponds to a particular H-ARQ process using that channel at a given time, and it would have been advantageous to use the channel ID to also identify the H-ARQ process in order to keep track of which H-ARQ process the communications are a part of instead of sending a separate identifier for this purpose.¹⁶ Weide, ¶¶79-80. A POSITA would have understood, and at minimum found obvious, that Lucent’s transceiver working with its processor (<i>see</i> [1.a]-[1.b]) is configured to cause the UE to receive from the base station a scheduling grant message that includes a H-ARQ process identification for the H-ARQ process. Weide, ¶81. • Figure 2 (“Implicit signalling of H-ARQ ACK/NACKs by Node-B”)

¹⁶*See, e.g.*, Ex. 1011 (Vayanos), ¶¶56, 66; Liu, ¶¶26, 33, 38, Figure 5 (“H-ARQ Channel ID”/“H-ARQ ID” “identify[ing] a specific process in a hybrid automatic repeat request (HARQ) process”); Weide, ¶¶79-80.

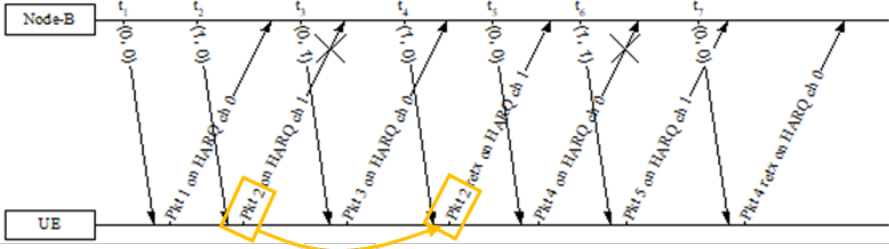
'247 Claims	Lucent
	“receive uplink scheduling information from the base station” “H-ARQ process identification” Figure 2. Implicit signalling of H-ARQ ACK/NACKs by Node-B 4-5 (“[I]f the New Data Indicator has not changed compared to the value in the previous <i>received transmission of a given H-ARQ process</i>, it implies a NACK. Conversely, if the New Data Indicator has changed compared to the value in the previous <i>received transmission of a given H-ARQ process</i>, it implies an ACK... Figure 2 illustrates the method by means of an example. <i>At time t_1, Node-B schedules a transmission on H-ARQ channel 0</i>, with NDI set equal to 0. The UE transmits the first packet in response, which is decoded correctly by the Node-B. <i>The schedule grant message sent by Node-B at time t_3 changes the NDI value for H-ARQ channel 0</i>, which implicitly indicates to the UE that the first packet was received correctly. So, the UE transmits a new packet on H-ARQ channel in response. Similarly, the second packet transmitted by the UE in response to the schedule grant message transmitted by the Node-B at time t_2 was received in error at the Node-B. <i>The schedule grant message transmitted by the Node-B to the UE at time t_4 uses the same values for NDI and H-ARQ channel as at time t_2</i>, which implicitly indicates to the UE that the second packet was received in error. In response, therefore, the UE retransmits the second packet.”) - See also 1.

'247 Claims	Lucent
[1.e] determine whether to retransmit the data block based on the received uplink scheduling information and not based on whether the WTRU has received a negative acknowledgement (NACK) from the base station.	At least under PO's interpretation,¹⁷ Lucent discloses wherein the at least one transceiver (see [1.a]) and the processor (see [1.b]) are configured to cause the WTRU (see [1.pre]) to determine whether to retransmit the data block based on the received uplink scheduling information and not based on whether the WTRU has received a negative acknowledgement (NACK) from the base station (e.g., "the UE retransmits the second packet" "if the New Data Indicator" in the "schedule grant message" "has not changed compared to the value in the previous received transmission of a given H-ARQ process"). <u>E.g., Lucent:</u> See [1.a]-[1.d]. As discussed in [1.d], Lucent discloses that the UE receives a "schedule grant message transmitted by the Node-B." The schedule grant message includes "New Data Indicator (NDI) bit(s)" with which "[d]ownlink signalling of ACK/NACKs by the Node-B can be done implicitly." Lucent, 4-5, Figure 2. "[I]f the New Data Indicator has not changed compared to the value in the previous received transmission of a given H-ARQ process, it

¹⁷ Under at least PO's interpretation (which Petitioner disputes), **Lucent** discloses this element even if construed as means-plus-function. See §VIII; Weide, ¶¶86-87. In particular, Pantech's Infringement Contentions served on 2/15/2023 in the LGE Litigation rely on functionality identical to **Lucent's**—UE determines whether to retransmit data based on a new data indicator, rather than receipt of an explicit NACK message—as meeting this limitation. See Ex. 1022, 17-26; Weide n.2, ¶¶82-87.

'247 Claims	Lucent
	implies a NACK...In response...the UE retransmits the [previous] packet.” <i>Id.</i> “Conversely, if the New Data Indicator has changed compared to the value in the previous received transmission of a given H-ARQ process, it implies an ACK...So, the UE transmits a new packet on H-ARQ channel in response.” <i>Id.</i> Thus, Lucent discloses that the UE determines whether to retransmit the data block based on the NDI included in the received scheduled grant message and not based on whether the UE received a NACK from the Node-B. <i>Id.</i>; Weide, ¶¶82-84. A POSITA would have understood, and at minimum found obvious, that Lucent’s processor working with its transceiver (<i>see</i> [1.a]-[1.b]) is configured to cause the UE to determine whether to retransmit the data block based on the scheduling grant message and not based on whether the UE received a NACK from the Node-B. Weide, ¶85. Figure 2 (“Implicit signalling of H-ARQ ACK/NACKs by Node-B”)  (x, y) : x is the H-ARQ SAW channel, y is the New Data Indicator Figure 2. Implicit signalling of H-ARQ ACK/NACKs by Node-B 4-5 (“§3.1.3 Signalling of ACK/NACKs[:] <i>Downlink signalling of ACK/NACKs by the Node-B can be done implicitly by using the New Data Indicator (NDI) bit(s) in the case of Node-B controlled scheduling. Precisely, if the New Data Indicator has not changed compared to the value in the previous received transmission of a given H-</i>

'247 Claims	Lucent
	<i>ARQ process, it implies a NACK. Conversely, if the New Data Indicator has changed compared to the value in the previous received transmission of a given H-ARQ process, it implies an ACK...</i>Figure 2 illustrates the method by means of an example. At time t_1, Node-B schedules a transmission on H-ARQ channel 0, with NDI set equal to 0. The UE transmits the first packet in response, which is decoded correctly by the Node-B. <i>The schedule grant message sent by Node-B at time t_3 changes the NDI value for H-ARQ channel 0, which implicitly indicates to the UE that the first packet was received correctly. So, the UE transmits a new packet on H-ARQ channel in response.</i> Similarly, the second packet transmitted by the UE in response to the schedule grant message transmitted by the Node-B at time t_2 was received in error at the Node-B. <i>The schedule grant message transmitted by the Node-B to the UE at time t_4 uses the same values for NDI and H-ARQ channel as at time t_2, which implicitly indicates to the UE that the second packet was received in error. In response, therefore, the UE retransmits the second packet.”)</i> • See also 1-2 (§2.1).
[2] The WTRU of claim 1, wherein the at least one transceiver and the processor are further configured to cause the WTRU to, in response to a determination to retransmit the data block, retransmit the data block.	See [1]. Lucent further discloses that the at least one transceiver (see [1.a]) and the processor (see [1.b]) are further configured to cause the WTRU (see [1.pre]) to, in response to a determination to retransmit the data block, retransmit the data block (e.g., “the UE retransmits the second packet” “if the New Data Indicator” in the “schedule grant message” “has not changed compared to the value in the previous received transmission of a given H-ARQ process”). <u>E.g., Lucent:</u> See [1.e].

'247 Claims	Lucent
	Lucent further discloses that, if “[t]he schedule grant message transmitted by the Node-B to the UE at time t4 uses the same values for NDI and H-ARQ channel as at time t2, which implicitly indicates to the UE that the second packet was received in error[,]...the UE retransmits the second packet.” Lucent, 4-5; Figure 2; Weide, ¶¶88–90. A POSITA would have understood, and at minimum found obvious that, Lucent’s transceiver working with its processor (see [1.a]-[1.b]) is configured to cause the UE to retransmit the previous data block to the Node-B in response to the processor’s determination to send the previous data block. Weide, ¶91. • 4-5 (see [1.e]) • Figure 2  “retransmit the data block” • See also 1-2 (§2.1).
[8] The WTRU of claim 1, wherein the scheduling information indicates a modulation and coding scheme.	See [1]. Lucent further discloses that the scheduling information indicates a modulation and coding scheme (e.g., “schedule grant message contains...modulation and coding scheme (MCS)”). <u>E.g., Lucent:</u> See [1.pre]-[1.e].

'247 Claims	Lucent
	As discussed in [1.d], Lucent further discloses that the UE receives a “schedule grant message transmitted by the Node-B.” Lucent, 1. Lucent further discloses that “[t]he schedule grant message contains...modulation and coding scheme (MCS).” <i>Id.</i>; Weide, ¶¶92–94. • 1 (§2.1) (“Here, <i>the UE’s uplink transmission is in response to a schedule grant message transmitted by the Node-B...The schedule grant message contains</i> H-ARQ parameters, transport block size (TBS) indication, and <i>modulation and coding scheme (MCS)....</i>” • <i>See also 2-3</i> (§3.1).
[11.pre] A method comprising:	Lucent discloses a method (e.g., “method” of “[d]ownlink signalling of ACK/NACKs by the Node-B...implicitly by using the New Data Indicator (NDI) bit(s)”). <u>E.g., Lucent:</u> <i>See also</i> [1.c]-[1.e]. Weide, ¶¶95-97. • 4-5 (“§3.1.3 Signalling of ACK/NACKs[:] <i>Downlink signalling of ACK/NACKs by the Node-B can be done implicitly by using the New Data Indicator (NDI) bit(s) in the case of Node-B controlled scheduling... Figure 2 illustrates the method by means of an example....</i>”) • <i>See also</i> Figure 2.
[11.a] transmitting, by a wireless transmit/receive unit (WTRU), a data block to a base station using a hybrid automatic	<i>See</i> [1.pre], [1.c]. Weide, ¶98.

'247 Claims	Lucent
repeat request (H-ARQ) process;	
[11.b] receiving, by the WTRU, uplink scheduling information from the base station, wherein the uplink scheduling information includes a H-ARQ process identification for the H-ARQ process; and	<i>See</i> [1.pre], [1.d]. Weide, ¶99.
[11.c] determining, by the WTRU, whether to retransmit the data block based on the received uplink scheduling information and not based on whether the WTRU has received a negative acknowledgement (NACK) from the base station.	<i>See</i> [1.pre], [1.e]. Weide, ¶100.
[12] The method of claim 11 further comprising, in	<i>See</i> [11], [2]. Weide, ¶101.

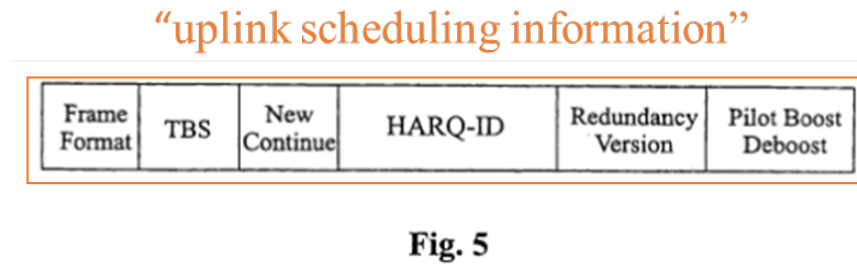
'247 Claims	Lucent
response to a determination to retransmit the data block, retransmitting, by the WTRU, the data block.	
[18] The method of claim 11, wherein the scheduling information indicates a modulation and coding scheme.	<i>See</i> [11], [8]. Weide, ¶102.

B. Ground 2: Lucent in view of Liu (Claims 1-2, 8, 11-12, 18)

Claims 1-2, 8, 11-12, and 18 require the uplink scheduling information to include a “H-ARQ process identification for the H-ARQ process.” As discussed above in §IX.A ([1.d]/[11.d]), this claim element is disclosed or at least rendered obvious by **Lucent**. Weide, ¶103.

To the extent further disclosure is required, **Liu** makes express that **Lucent’s** H-ARQ channel number is a H-ARQ process identification. Weide, ¶104. **Liu discloses that uplink scheduling information includes a H-ARQ process identification for the H-ARQ process** (e.g., “downlink control channel” subframe “used in Node B scheduled mode” includes a “HARQ Channel ID”/“HARQ ID” that

“identif[ies] a specific process in a hybrid automatic repeat request (HARQ) process”; Figure 5). Liu, ¶¶25-33, Figure 5. **Liu** discloses using a “downlink control channel” to transmit uplink scheduling information from a “specific Node B” to “remote terminal[]” servers in “Node B scheduled mode.” Liu, ¶25; Weide, ¶105. As shown in annotated Figure 5 below, **Liu**’s uplink scheduling information includes a “HARQ ID,” which “identif[ies] a specific process in a hybrid automatic repeat request (HARQ) process.” *Id.* ¶¶25, 33; Figure 5; Weide, ¶105. Additionally, **Liu** refers to “HARQ ID” as a “HARQ channel ID,” indicating that a HARQ channel ID is a HARQ process ID. Liu ¶¶25-33; Weide, ¶105.



Lucent and **Liu** are analogous prior art and in the same field as the ’247—which includes scheduling uplink transmissions in a HARQ system—and are reasonably pertinent to the alleged problems identified in the ’247 of implementing efficient control signaling for H-ARQ. *E.g.*, ’247, Abstract, 2:30-48, 8:10-22; Lucent, 1-2, 4-5; Liu, Abstract, ¶¶11, 33; Weide, ¶106.

To the extent **Lucent’s** “H-ARQ channel” number does not identify a specific H-ARQ process, a POSITA would have been motivated to modify **Lucent’s** schedule grant message to additionally include **Liu’s** “HARQ ID” as one of the “H-ARQ parameters” (taught by **Lucent**) to “identify a specific process in a [HARQ] process” for which a previous transmission by the UE needs to be resent. **Lucent**, 1, **Liu**, ¶33; **Weide**, ¶107. For example, if a given H-ARQ channel between a UE and base station includes multiple H-ARQ processes, adding **Liu’s** HARQ ID to **Lucent’s** schedule grant message would advantageously allow a base station to more precisely identify which H-ARQ process a desired retransmission corresponds to, thus enabling **Lucent’s** existing system, which runs one H-ARQ process per H-ARQ channel, to accommodate in parallel multiple H-ARQ processes in a H-ARQ channel. **Weide**, ¶107. A POSITA would have had a reasonable expectation of success in applying **Liu’s** teachings (e.g., uplink scheduling information including a HARQ ID) to **Lucent’s** scheduling grant message. **Liu**, ¶¶25-33, 36-44; **Weide**, ¶108. This would have been a straightforward application of **Liu’s** teachings in a manner that advantageously improves the accuracy and efficiency of uplink retransmissions. **Weide**, ¶117.

C. Grounds 3-4: Lucent (optionally in view of Liu) in view of Das (Claims 9-10, 19-20)

1. Claims 9, 19

Claims 9/19 depend from claims 1/11, respectively, and further recite **“wherein the transmitted data block has a first modulation and coding scheme (MCS) and the scheduling information indicates a second MCS, wherein the first MCS and the second MCS are different.”**

As discussed in Grounds 1 and 2, **Lucent** (optionally in view of **Liu**) discloses or renders obvious claims 1/11. Weide, ¶109.

Das (Ex. 1009) further discloses that the transmitted data block has a first modulation and coding scheme (MCS), and the retransmitted data block has a second MCS wherein the first MCS and the second MCS are different (*e.g.*, “different modulation, different coding, and different number of codes” used “for a retransmission than is used in the original transmission.”). **Das** discloses, in an “adaptive Hybrid ARQ scheme,” that “different modulation, different coding, and a different number of codes” are used “for a retransmission than is used in the original transmission” “based on the condition of the communication channel.” **Das**, ¶¶5, 9, 20, 23, claims 6-7; Weide, ¶¶110-12.

As discussed in §§IX.A-IX.B ([8]), **Lucent** (optionally in view of **Liu**) discloses or renders obvious that the scheduling information includes a

modulation and coding scheme. Weide, ¶113. Furthermore, **Lucent** discloses that, in “Node-B controlled scheduling,” Node-B “select[s] the commanded MCS,” and that a “lower MCS” may be preferable depending on the power and noise limitations. Lucent, 3; Weide, ¶114.

A POSITA would have been motivated to apply **Das’s** teachings of using different modulation and coding schemes “for a retransmission than is used in the original transmission” in implementing **Lucent’s** Node-B controlled scheduling (optionally modified by **Liu**) to advantageously tailor the MCS of the retransmission to the “condition of the communication channel,” as taught by **Das**. *E.g.*, Das, ¶¶5, 9, 19-21, 23, claims 6-7; Lucent, 1-3; Weide, ¶¶110-15. For example, if the original transmission is lost due to poor channel quality, a POSITA would have been motivated to indicate a lower MCS in the scheduling information sent for the retransmission based on the UE’s “power margin availability” or to reduce likelihood of errors because a lower MCS is more robust. Lucent, 3, Weide, ¶¶114-15.

Like Lucent and Liu, **Das** is in the same field as the ’247 and is reasonably pertinent to the alleged problems identified in the ’247 of implementing efficient control signaling for H-ARQ. *See* §IX.B; Das, Abstract, ¶¶8, 9; Weide, ¶116. A POSITA would have been motivated to modify **Lucent’s** system (optionally in view

of **Liu**) such that the MCS of the scheduling assignment message sent for the original transmission is different from the MCS of the scheduling assignment message sent for the retransmission, as taught by **Das**, in order to account for the “changes in the quality of the communications channel.” **Das**, ¶¶4, 19-20; **Weide**, ¶116. A POSITA would have had a reasonable expectation of success in doing so as **Lucent** already contemplates selecting a “lower MCS” or a “higher MCS” depending on the power and noise limitations in the communication channel. **Lucent**, 2-3; **Weide**, ¶117.

Thus, **Lucent (optionally in view of Liu) in view of Das** renders obvious claims 9 and 19. **Weide**, ¶¶109-18.

2. Claims 10, 20

Claims 10/20 depend from claims 9/19, respectively, and further recite “**the at least one transceiver and the processor are further configured to cause the WTRU to, in response to the determination to retransmit the data block, retransmit the data block [claim 2] using the second MCS [claim 9]” and “in response to a determination to retransmit the data block, retransmitting the data block [claim 12] using the second MCS [claim 19],” respectively.**

As discussed in §§IX.A-B, **Lucent** (optionally in view of **Liu**) discloses or renders obvious the features recited in claims 2/12. **Weide**, ¶119. A POSITA would have been motivated to apply **Das’s** teachings of using a different MCS for

retransmission than for the original transmission (*see* [9]/[19]) to **Lucent’s** teachings (optionally modified by **Liu**) of retransmitting the data block in response to a determination to retransmit the data block (*see* [2], [12] in Grounds 1-2) for the same reasons discussed above for [9]/[19], such that **Lucent’s** UE (as optionally modified by **Liu’s** teachings, *see* Grounds 1-2) retransmits the data block using a second MCS that is different from the first MCS that is used to make the original transmission in response to a determination to retransmit the data block. *See* §IX.C.1; Weide, ¶120.

Thus, **Lucent (optionally in view of Liu) in view of Das** renders obvious claims 10 and 20. Weide, ¶¶119-21.

D. Ground 5: Kuchibhotla in view of Liu (Claims 1-7, 11-17)

1. Overview of Kuchibhotla

Kuchibhotla is generally directed to an improved H-ARQ technique that enhances the reliability of ACK/NACK messages that may be lost or misread. **Kuchibhotla**, ¶¶40, 71; Weide, ¶122. To address this problem, **Kuchibhotla** discloses including a new data indicator, called a “new data expected” (NDE) field, in the scheduling assignment message (SAM) to indicate whether retransmission of prior data is needed. **Kuchibhotla**, ¶¶40, 71; §IX.A.1; Weide, ¶¶122-23. According to **Kuchibhotla**, the NDE value is a more “reliable” indicator than an ACK/NACK transmission because the NDE indicator “is included in the [SAM],” which has

“CRC protection” that reduces erroneous transmissions, whereas ACK/NACK transmissions do not. *Id.*, ¶¶48, 58-59, 62, 71, 73, Figure 4; Weide, ¶124.

In particular, the base transceiver station (BTS) sends the NDE indicator to a mobile station (MS) in a SAM, which is uplink scheduling information. Kuchibhotla, ¶¶40, 55, 62; Weide, ¶¶124-25. The BTS sets NDE to 1 if “the previous packet was received properly,” signaling to the MS that the “BTS is now expecting new data” in the next transmission. Kuchibhotla, ¶71; Weide, ¶125. Alternatively, if the MS’s “data was not received properly” by the BTS, the BTS sets the NDE to 0, signaling to the MS that “the previous, old data is expected to be retransmitted.” *Id.*

The NDE is a particularly useful indicator of “message acceptability” when an ACK/NACK transmission is received in error. Kuchibhotla, ¶¶55, 73; Weide, ¶125. For example, as annotated in Figure 10, “the MS has an error and misreads [] the NACK” (green) “as an ACK” (red), “but correctly receives the NDE” (green). Kuchibhotla, ¶73, Figure 10; Weide, ¶125. When this happens, “the MS determines that the NDE=0 is more reliable 618, ignoring the misread ACK [sent as a NACK] and preparing to send the old packet 604.” *Id.*

NDI (MS TFRI)	ACK/NACK SENT (BTS)	ACK/NACK RECEIVED (MS)	NDE SENT (BTS)
0 (PREVIOUS PACKET)	ACK	ACK	0
1 (1 st ATTEMPT)	NACK	NACK	1
1 (2 nd ATTEMPT)	NACK	ACK	0
1 (3 rd ATTEMPT)	ERROR: FLUSH ACK	ACK	0

FIG. 10

The opposite error can also occur. As annotated in Figure 8, the MS “misreads 610 the ACK as a NACK, but correctly receives the NDE.” Kuchibhotla, ¶71, Figure 8 (below); Weide, ¶126. In this situation, “the MS determines that the NDE=1 is more reliable 622, ignoring the misread NACK and preparing to send a new packet 600.” *Id.*

NDI (MS TFRI)	ACK/NACK SENT (BTS)	ACK/NACK RECEIVED (MS), t	NDE $t+t_0$
0 (PREVIOUS PACKET)	ACK	ACK	1
1 (1 st ATTEMPT)	NACK	NACK	1
1 (2 nd ATTEMPT)	ACK	NACK	0
1 (3 rd ATTEMPT)	ACK (2 nd)	ACK	1

FIG. 8

2. Motivation to Modify Kuchibhotla with the Teachings of Liu

As discussed in §IX.D.1, **Kuchibhotla** discloses a H-ARQ system that provides a more reliable and accurate way of indicating whether a retransmission is needed by including a “new data expected” (NDE) indicator in the scheduling assignment message (SAM). *See* §IX.D.1; Weide, ¶127. For example, **Kuchibhotla** discloses using an NDE value to indicate that a prior data block was NACKed by the BTS because it was not “properly receive[d].” **Kuchibhotla**, ¶73; Weide, ¶127. While the NDE provides an indication of *whether* retransmission is required, **Kuchibhotla** does not specify how a UE ascertains *which* data needs to be retransmitted. Weide, ¶127.

Liu, like **Kuchibhotla**, discloses including a “new/continue data indication” in uplink scheduling information (e.g., on a downlink control channel) that indicates whether “a new packet is to be sent,” along with other fields that more accurately identify what needs to be retransmitted, such as a “HARQ ID” and “redundancy version.” **Liu**, ¶¶25-33, Figure 5; Weide, ¶128. The “HARQ ID” “identif[ies] a specific process in a [HARQ] process,” and thus serves as a H-ARQ process identification. **Liu**, ¶33; Weide, ¶128. “Together, the HARQ and redundancy version” allow the base station to specify “the specific retransmission that the base station wants the remote terminal to send.” **Liu**, ¶33; Weide, ¶128.

A POSITA would have been motivated to modify **Kuchibhotla's** SAM to include at least the H-ARQ process identification field (in addition to the existing NDE field in the SAM), as taught by **Liu**, to advantageously enable the UE to more accurately pinpoint which retransmission was needed. Weide, ¶¶129-30. This additional H-ARQ process identification field would be especially beneficial in situations where a UE may misinterpret which prior transmission a given SAM corresponds to. Weide, ¶129. This problem arises in “asynchronous HARQ,” which **Kuchibhotla** teaches. Kuchibhotla, ¶60; Weide, ¶129. In asynchronous HARQ, **Kuchibhotla** explains that “[t]here is anti-correlation between SAM and ACK/NACK usage,” which creates unpredictability as to when, and even *whether*, the BTS will transmit a SAM after sending an ACK/NACK for a given data transmission received from the MS. Kuchibhotla, ¶60 (due to “anti-correlation” in “asynchronous HARQ,” “typically non-contiguous frame scheduling is expected” and “one does not want to send a larger SAM message if all that is needed is to send a simple ACK/NACK indication”); Weide, ¶129. This unpredictability frustrates the ability of a MS to correctly determine which prior transmission a SAM (containing the NDE to trigger retransmission) belongs to. Kuchibhotla, ¶¶60, 71; Weide, ¶129.

For example, in asynchronous HARQ, a given SAM (e.g., SAM1) indicating whether a respective prior transmission (e.g., tx1) was received may not arrive at the MS until *after* the MS has made a subsequent transmission (e.g., tx2). Weide, ¶129. But due to the unpredictable nature of SAM receptions in an asynchronous HARQ system, the MS would be unable to correctly determine which prior transmission the SAM1 is intended for (e.g., either tx1 or tx2). Kuchibhotla, ¶¶60, 62, 65; Weide, ¶129. For example, if the MS interprets the SAM as corresponding to the “previous packet,” as taught by **Kuchibhotla** (¶62), the MS would incorrectly interpret SAM1 as corresponding to tx2, not tx1 for which SAM1 was intended. Weide, ¶129; *see also* Lucent, 1, 4-5. In another example, if SAM1 is received during a time at which the MS is expecting to receive either SAM1 or SAM2 (for tx2), the MS simply would not be able to ascertain which prior transmission SAM1 was intended for. Kuchibhotla, ¶¶60, 65; Weide, ¶129.

Thus, there is a need in **Kuchibhotla’s** system to enable the MS to correctly identify which prior transmission a SAM belongs to. By including a H-ARQ process ID, as taught by **Liu**, in **Kuchibhotla’s** SAM, the resulting system would enable the MS to more accurately pinpoint which retransmission needs to be made, thus avoiding retransmitting the wrong packet. Weide, ¶¶128-30.

Like Liu, **Kuchibhotla** is in the same field as the '247 and is reasonably pertinent to the alleged problems identified in the '247 of implementing efficient transmissions for H-ARQ. *See, e.g.*, Kuchibhotla, ¶¶25, 41; §IX.B; Weide, ¶131.

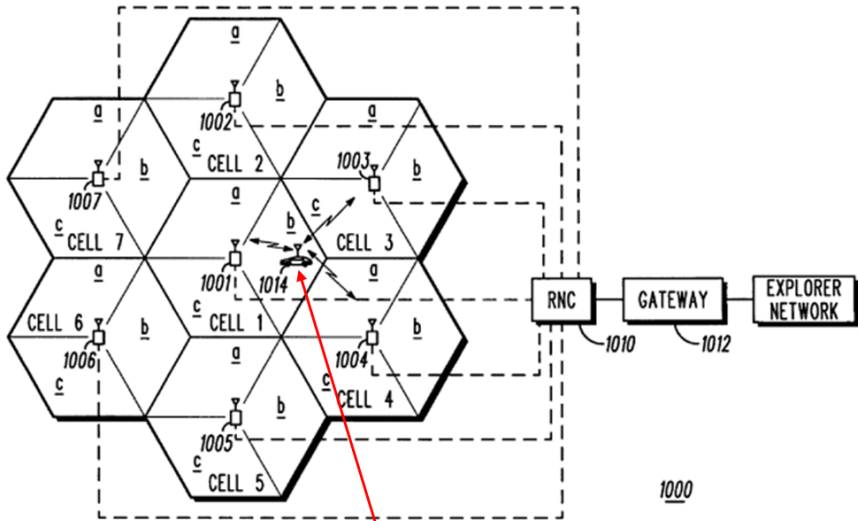
A POSITA would have had a reasonable expectation of success in applying **Liu**'s teachings (e.g., uplink scheduling information including a HARQ ID) to **Kuchibhotla**'s SAM which includes an NDE indicator, because it was well-known to use a H-ARQ IDs in SAMs. Weide, ¶132.¹⁸

3. Claim Chart

In addition to §IX.D.1-IX.D.2, the following identifies example disclosures followed by bulleted excerpts that each disclose and/or render obvious claims 1-7 and 11-17. Weide, ¶¶133-200.

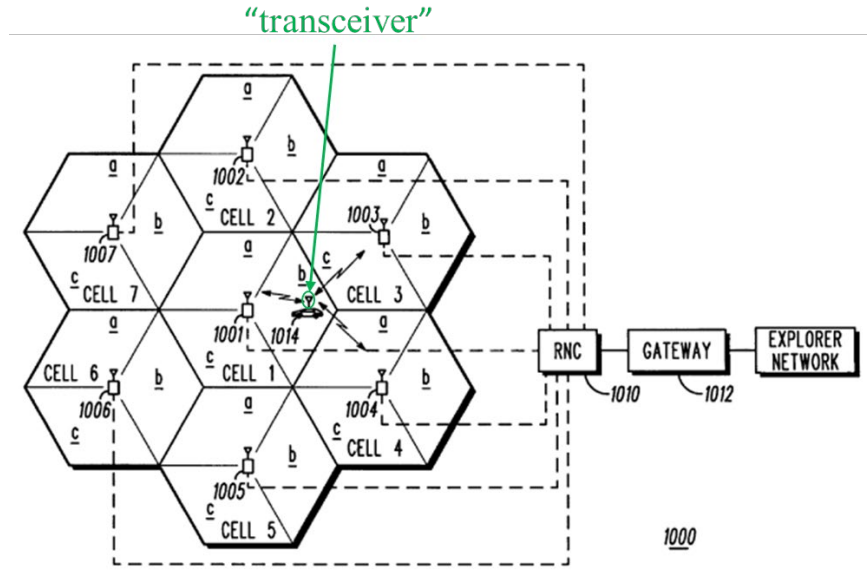
'247 Claims	Kuchibhotla in view of Liu
[1.pre] A wireless transmit/receive unit (WTRU) comprising:	Kuchibhotla discloses a wireless transmit/receive unit (WTRU) (e.g., “mobile station (MS)” that wirelessly transmits information to a “[base transceiver station]” (BTS) over a “reverse link” and wirelessly receives information from the BTS over a “forward link”). <u>E.g., Kuchibhotla:</u> Kuchibhotla discloses a “mobile station (MS)” 1014, such as a “cellular communication device,” that “communicates with

¹⁸ *E.g.*, Liu, ¶¶25-33, 36-44; Ex. 1010 (Khan) ¶¶20, 23, 31, 37, Table 1, Figure 7, Claim 3; Kuchibhotla, ¶¶51, 65.

'247 Claims	Kuchibhotla in view of Liu
	each BTS in communication system 1000 via an air interface that includes a forward link (from the BTS to the MS) and a reverse link (from the MS to the BTS).” Kuchibhotla, ¶¶2, 44, Figure 5; Weide, ¶133-35. Figure 5  FIG. 5 “a wireless transmit/receive unit (WTRU)” ¶2 (“...<i>user equipment (UE) such as a mobile station (MS)</i> communicates with any one or more of a plurality of base station subsystems (BSSs) dispersed in a geographic region. <i>The mobile station is typically a cellular communication device.</i>”) ¶3 (“[T]he BSS communicates with the MS over a Forward Traffic Channel in a forward link and <i>the MS communicates with the BSS</i> over a Reverse Traffic Channel in a reverse link.”) ¶44 (“Referring now to FIGS. 3 and 5, communication system 1000 further includes at least one mobile

'247 Claims	Kuchibhotla in view of Liu
	<i>station (MS) 1014. MS 1014 may be any type of wireless user equipment (UE), such as a cellular telephone...MS 1014 wirelessly communicates with each BTS in communication system 1000 via an air interface that includes a forward link (from the BTS to the MS) and a reverse link (from the MS to the BTS).”)</i> • <i>See also ¶5.</i>
[1.a] at least one transceiver; and	Kuchibhotla discloses at least one transceiver (e.g., transceiver of a MS 1014, which is a wireless transmit/receive unit, <i>see</i> [1.pre]). <u>E.g., Kuchibhotla:</u> <i>See</i> [1.pre]. As discussed in [1.pre], Kuchibhotla discloses a wireless transmit/receive unit (WTRU). Because a WTRU transmits and receives information, it includes a transceiver. Weide, ¶¶136-38. At minimum, a POSITA would have found obvious to use a transceiver in the MS for transmitting and receiving information as transceivers were commonly used for this purpose at the time.¹⁹ Weide, ¶138. Thus, Kuchibhotla not only renders obvious, but affirmatively discloses, that the MS includes a transceiver. <i>Id.</i> • Figure 5

¹⁹ *See, e.g., Rathonyi* at 1:33-39, 15:64-66, Claim 9, Figure 1.

'247 Claims	Kuchibhotla in view of Liu
	 FIG. 5 • ¶44 (see [1.pre]) <i>See also</i> ¶5, Figure 13.
[1.b] a processor;	Kuchibhotla discloses a processor (e.g., processor of “MS” that makes “reliability” determinations of signals received from a BTS). <u>E.g., Kuchibhotla:</u> <i>See</i> [1.pre]-[1.a]. Kuchibhotla discloses that the MS may be “any type of wireless [UE],” such as “a cellular phone.” Kuchibhotla, ¶44. A POSITA would have understood that the MS has a processor to control its functions, such as making “reliability” determinations of received ACK/NACK signals based on NDE values received from a BTS. Kuchibhotla, ¶¶71, 73; Weide, ¶¶139-41. At minimum, a POSITA would have found it obvious to use a processor in the MS for controlling its functions, as

'247 Claims	Kuchibhotla in view of Liu
	processors were commonly used for this purpose at the time.²⁰ Weide, ¶141. Thus, Kuchibhotla not only renders obvious, but affirmatively discloses, that the MS includes a processor. <i>Id.</i> • ¶44 (<i>see</i> [1.pre]) • ¶71 (“...the MS has an error and misreads 610 the ACK as a NACK, but correctly receives the NDE. <i>The MS must then vote 620 on the reliability of the misread NACK or the NDE=1....</i>”) • ¶73 (“...the MS has an error and misreads 614 the NACK as an ACK, but correctly receives the NDE. <i>The MS must then vote 616 on the reliability of the misread ACK or the NDE=0....</i>”) • <i>See also</i> ¶¶24, 41, 56, 68, 74, 77, Figure 13.
[1.c] wherein the at least one transceiver and the processor are configured to cause the WTRU to: transmit, using a hybrid automatic repeat request (H-ARQ) process, a data block to a base station;	Kuchibhotla discloses wherein the at least one transceiver (<i>see</i> [1.a]) and the processor (<i>see</i> [1.b]) are configured to cause the WTRU (e.g., “MS,” <i>see</i> [1.pre]) to: transmit, using a hybrid automatic repeat request (H-ARQ) process, a data block to a base station (e.g., “a data block transmitted” by “the source MS” to “an Active Set BTS” “on a specific Hybrid ARQ channel”). <u>E.g., Kuchibhotla:</u> <i>See</i> [1.a]-[1.b]. Kuchibhotla further discloses that “the MS 1114 transmits frames to a plurality of BTSs,” wherein the frames “include[] ... data.” Kuchibhotla, ¶53. The MS transmits a “data block” to a BTS using “a specific Hybrid ARQ channel,” which a POSITA would have understood as using a H-ARQ process to

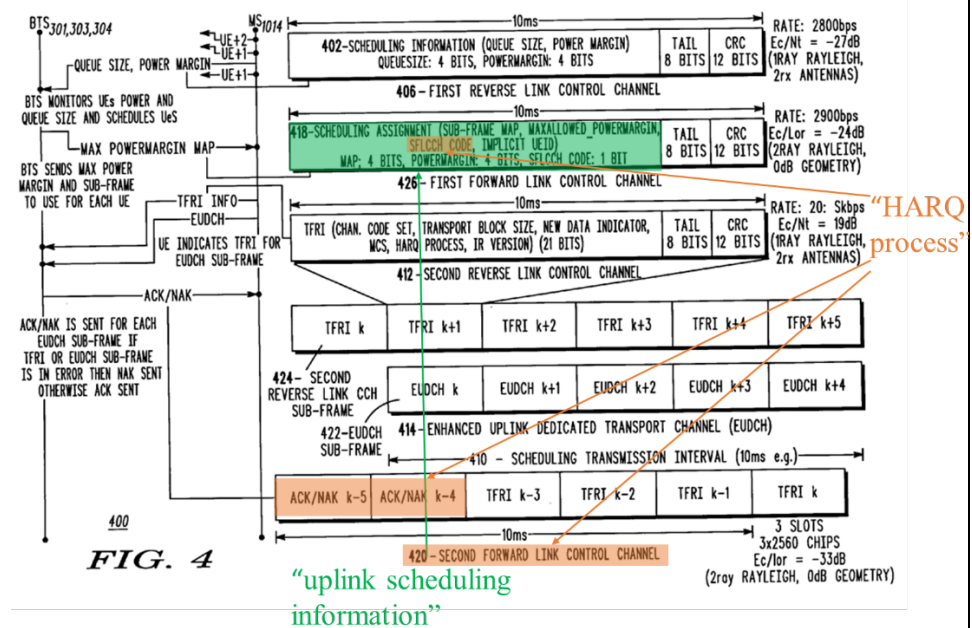
²⁰ *See, e.g.,* Rathonyi at 1:33-39, 15:64-66, Claim 9, Figure 1.

'247 Claims	Kuchibhotla in view of Liu
	send data blocks to a base station. Kuchibhotla, ¶51; Weide, ¶¶142-44. Thus, Kuchibhotla not only renders obvious, but affirmatively discloses, that its transceiver working with its processor (<i>see</i> [1.a]-[1.b]) is configured to cause the MS to transmit data blocks to a BTS using a HARQ process. Weide, ¶145. • ¶41 (“In general, the present invention supports active set handoff and scheduling functions by allowing <i>a mobile station (MS) to provide HARQ ACK/NACK coding information to improve data throughput of an enhanced reverse link transmission to Active Set base transceiver stations (BTSs)</i>. The present invention allows more efficient implementation of an enhanced reverse link channel with...<i>Hybrid ARQ (HARQ)</i>...”) • ¶51 (“...when <i>a data block transmitted on a specific Hybrid ARQ channel</i> has successfully been <i>decoded by an Active Set BTS</i>, the BTS acknowledges the successful decoding by <i>conveying an ACK to the source MS (e.g. MS 1014)</i>”) • ¶53 (“[D]uring reverse link communications, <i>the MS 1114 transmits frames to a plurality of BTSs 301, 303, 304. The structure of the frames, includes:...data...</i>The information contained in the frame is referred to herein as soft information. The <i>BTSs can combine frames from multiple re-transmissions using an H-ARQ scheme.</i>”) • ¶21 (“<i>The details for how to implement the various H-ARQ schemes are commonly known in the art</i> and therefore are not discussed herein.”) • <i>See also</i> ¶¶6, 15, 17, 20, 22, 44, 53-54, 58, Figure 4.

'247 Claims	Kuchibhotla in view of Liu
[1.d] receive uplink scheduling information from the base station, wherein the uplink scheduling information includes a H-ARQ process identification for the H-ARQ process; and	Kuchibhotla discloses wherein the at least one transceiver (see [1.a]) and the processor (see [1.b]) are configured to cause the WTRU (see [1.pre]) to receive uplink scheduling information from the base station (e.g., “a [SAM] from a BTS to a communication device (MS)”) for the H-ARQ process (e.g., “To enable uplink Hybrid ARQ an acknowledged/not acknowledged (ACK/NACK) feedback code channel can be used,” where “[t]he MS is told by a scheduling BTS which downlink code channel it should listen to for receiving ACK/NACK information”; Figure 4; see [1.c]). <u>E.g., Kuchibhotla:</u> See [1.a]-[1.c]. Kuchibhotla further discloses “a scheduling assignment message” (“SAM”) sent “from a BTS to a communication device (MS).” Kuchibhotla, ¶¶40, 48, 58, Figure 4 (annotated below); Weide, ¶148. Kuchibhotla discloses that “[t]o enable uplink Hybrid HARQ an acknowledged/not acknowledged (ACK/NACK) feedback code channel can be used.” Kuchibhotla, ¶58. The SAM tells the MS “which downlink code channel it should listen to for receiving ACK/NACK information” for the HARQ process. <i>Id.</i>; Weide, ¶¶146-48. Thus, Kuchibhotla not only renders obvious, but affirmatively discloses, that its transceiver working with its processor (see [1.a]) is configured to cause the MS to receive a SAM from a BTS for the HARQ process. Weide, ¶149. • Figure 4

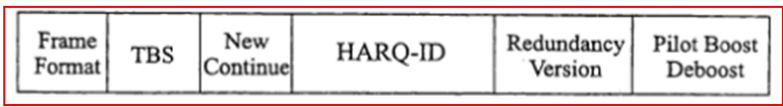
'247 Claims

Kuchibhotla in view of Liu



- ¶40 (“The present invention provides a method to enhance the reliability of the determination of ACK/NACK information, thereby resolving the issues of erroneous determination of an ACK as a NACK and NACK as an ACK both in and without soft handoff (SHO). This is achieved through a novel technique of using channel quality and “new data expected” indicators in *a scheduling assignment message from a BTS to a communication device (MS)*. This technique allows the set up of feedback information between the MS and active set BTSs such that a macro selection diversity benefit is obtained.)
- ¶48 (“Upon choosing an MS (e.g. MS 1014) to be scheduled, *each Active Set BTS 301, 303, 304 conveys a scheduling assignment 418 to the chosen MS, such as MS 1014, on a first forward link control channel 426...*The scheduling assignment 418 consists of the maximum allowed ‘power margin’ limit or target and a map of the allowed EUDCH sub-frame transmission

'247 Claims	Kuchibhotla in view of Liu
	intervals, such as a 2 ms sub-frame interval, for the next 10 ms transmission interval using a first forward link control channel 426.”) • ¶58 (“<i>To enable uplink Hybrid ARQ an acknowledged/not acknowledged (ACK/NACK) feedback code channel can be used. The MS is told by a scheduling BTS which downlink code channel it should listen to for receiving ACK/NACK information.</i> Alternatively, the ACK/NACK information can be coded in the SAM from the BTS to the MS. In the explicit mode, <i>the BTSs in the active set sends dedicated scheduling assignment messages (SAM) to each mobile that describes a data transmission opportunity on the enhanced uplink channel.</i>”) • See also ¶¶52, 53, 73. Liu discloses that uplink scheduling information includes a H-ARQ process identification for the H-ARQ process (e.g., “downlink control channel” subframe “used in Node B scheduled mode” includes a “HARQ ID” that “may identify a specific process in a hybrid automatic repeat request (HARQ) process”; Figure 5). <u>E.g., Liu:</u> Liu discloses that “a downlink control channel...may be transmitted from a specific Node B” “in Node B scheduled mode.” Liu, ¶¶25-33, Figure 5. The channel includes a “HARQ ID” to “identify a specific process in a hybrid automatic repeat request (HARQ) process.” <i>Id.</i> Liu’s “downlink control channel” subframe (Figure 5) sends “the remote terminal” uplink scheduling information to schedule “its transmission.” Liu, ¶33; Weide, ¶¶150-52. As discussed in §IX.D.2, a POSITA would have been motivated to modify Kuchibhotla’s “scheduling assignment

'247 Claims	Kuchibhotla in view of Liu
	messages” used for “Hybrid ARQ” using Liu’s “HARQ ID” to “identify a specific process in a hybrid automatic repeat request (HARQ) process,” so that the HARQ ID “may allow the base station to specify to the remote terminal the specific HARQ process and the specific retransmission that the base station wants the remote terminal to send,” such as a previous transmission that was NACKed by the BTS because it was not “properly receive[d].” Liu, ¶33, Kuchibhotla, ¶¶58, 73; Weide, ¶153. Modifying Kuchibhotla with Liu’s known functionality yields a system wherein the uplink scheduling information includes a H-ARQ process identification that identifies the specific H-ARQ process that corresponds to the transmission that needs to be resent (e.g., previous NACKed data block). Weide, ¶153. Figure 5 “uplink scheduling information”  Fig. 5 ¶18 (“FIG. 5 is a representation of a downlink subframe of the present invention”) ¶25 (“In accordance with the present invention, <i>a downlink control channel may be used in Node B scheduled mode</i>. This channel can be monitored by multiple remote terminals served by the same node, and <i>multiple such channel may be transmitted from a specific Node B</i>. This channel may be called Enhanced Uplink-Shared Control Channel (EU-SCCH).”) ¶33 (“As indicated above, the MAC ID indicates the remote terminal to which the message may be

'247 Claims	Kuchibhotla in view of Liu
	addressed. <i>The HARQ ID may identify a specific process in a hybrid automatic repeat request (HARQ) process</i>; and the redundancy version specifies which of several retransmissions is of interest. Together, the <i>HARQ ID</i> and redundancy version <i>may allow the base station to specify to the remote terminal the specific HARQ process and the specific retransmission that the base station wants the remote terminal to send</i>. The <i>transport format specifies the correct channelization code to be used by the remote terminal in its transmission</i>. The transport block size specifies the size of the packet to be sent by the remote terminal. The <i>new/continue data indication if set to new indicates that a new packet is to be sent</i>. If set to continue it indicates that a previously transmitted packet is to be sent.”) • <i>See also ¶¶26-32, 36-45.</i>
[1.e] determine whether to retransmit the data block based on the received uplink scheduling information and not based on whether the WTRU has received a negative acknowledgement (NACK) from the base station.	Kuchibhotla discloses wherein the at least one transceiver and the processor (see [1.a]-[1.b]) are configured to cause the WTRU to determine whether to retransmit the data block based on the received uplink scheduling information (e.g., “the mobile is required to read” an “[NDE] indicator [added] to the scheduling assignment message” “to determine if the BTS...is expecting new information or a retransmission of the previous transmission”; see Figures 8, 10) and not based on whether the WTRU has received a negative acknowledgement (NACK) from the base station. (e.g., “the MS determines that the NDE=0 is more reliable 618, ignoring

'247 Claims	Kuchibhotla in view of Liu
	the misread ACK [sent as NACK] and preparing to send the old packet 604”; <i>see</i> Figures 8, 10).²¹ <u>E.g., Kuchibhotla:</u> <i>See</i> [1.a]-[1.d]. As discussed in §IX.D.1, Kuchibhotla discloses that a UE uses an “new data expected” (NDE) field sent in a scheduling assignment message (SAM) from the BTS as a more “reliable” indicator than an ACK/NACK message to determine whether to retransmit previously sent data. Kuchibhotla, ¶¶40, 62, 71. In particular, the MS “is required to read [the NDE] to determine if the BTS...is expecting new information [(NDE=1)] or a retransmission of the previous transmission [(NDE=0)].” <i>Id.</i> “If the ACK/NACK and NDE disagreed...the MS determines that the NDE=0 is more reliable...ignoring the misread ACK and preparing to send the old packet” (Figure 10), or “the MS determines that the NDE=1 is more reliable...ignoring the misread NACK and preparing to send a new packet” (Figure 8). <i>Id.</i>, ¶¶71, 73, Figures 8, 10; Weide, ¶¶154-60. Thus, Kuchibhotla not only renders obvious, but affirmatively discloses, that its processor working with its transceiver (<i>see</i> [1.b]) is configured to cause the MS to determine whether to retransmit the data block based on the scheduling assignment

²¹ Additionally, under PO’s interpretation set forth in its infringement contentions (*see* n.17), **Kuchibhotla’s** disclosure of an MS determining whether to retransmit data based on a new data expected (NDE) indicator satisfies this limitation. Weide n.4, ¶¶154-164; Ex. 1022, 17-26.

'247 Claims

Kuchibhotla in view of Liu

message and not based on whether the MS received a NACK from the BTS. Weide, ¶161.²²

- Figure 8 (annotated)

NDI (MS TFRI)	ACK/NACK SENT (BTS)	ACK/NACK RECEIVED (MS), t	NDE $t+t_0$
0 (PREVIOUS PACKET)	ACK	ACK	1
1 (1 st ATTEMPT)	NACK	NACK	1
1 (2 nd ATTEMPT)	ACK	NACK	0
1 (3 rd ATTEMPT)	ACK (2 nd)	ACK	1

“received uplink scheduling information”

“determine whether to retransmit...based on the received uplink scheduling information and not based on whether the WTRU has received a negative acknowledgement (NACK)”

FIG. 8

- Figure 10 (annotated)

NDI (MS TFRI)	ACK/NACK SENT (BTS)	ACK/NACK RECEIVED (MS)	NDE SENT (BTS)
0 (PREVIOUS PACKET)	ACK	ACK	0
1 (1 st ATTEMPT)	NACK	NACK	1
1 (2 nd ATTEMPT)	NACK	ACK	0
1 (3 rd ATTEMPT)	~~ERROR: FLUSH~~ ACK	ACK	0

“received uplink scheduling information”

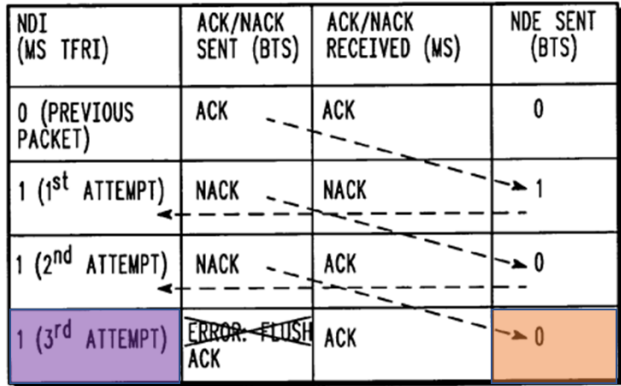
FIG. 10

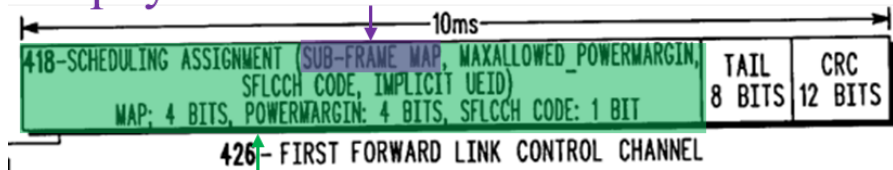
- ¶40 (see [1.d])

²² **Kuchibhotla** renders obvious this element even if construed as means-plus-function. See §VIII; Weide, ¶¶162-64.

'247 Claims	Kuchibhotla in view of Liu
	• ¶55 (“[T]he present invention provides a supplementary indicator of message acceptability that is used in conjunction with the ACK/NACK information. In a first embodiment, <i>the supplementary indicator is a New Data Expected (NDE) indicator that is sent in a subsequent scheduling assignment message (SAM) from the BTS.</i> In this embodiment, <i>following the reception of ACK/NACK information on the ACK/NACK channel, the MS does not flush data in its buffer until a NDE is received in a subsequent SAM.</i> By coupling the both the ACK/NACK information and the NDE indicator, the mobile is able <i>to make a more reliable conclusion regarding the success of the previous transmission.</i>”) • ¶62 (“The present invention further adds a one bit “<i>new data expected</i>” indicator to the scheduling assignment message...and the mobile is required to read this to determine if the BTS (that sent it the previous SAM message) is expecting new information or a retransmission of the previous transmission. If the mobile receives a “<i>new data expected</i>” indicator in the scheduling assignment message it can reliably determine that the BTS has in fact successfully received the previous packet...Note that <i>this mechanism is also useful in the case where the mobile receives an ACK from the BTS and interprets it as a NACK (a more probable erroneous condition).</i>”) • ¶71 (“<i>If the ACK/NACK and NDE disagreed</i>, a voting procedure 616 would be used, as will be explained below...<i>In this case, the BTS properly receives 606 the retransmitted data and indicates this with an ACK 608 and the sending of and NDE of 1. However, the MS has an error and misreads 610 the ACK as a NACK, but correctly receives the NDE. The MS must then vote</i>

'247 Claims	Kuchibhotla in view of Liu
	<i>620 on the reliability of the misread NACK or the NDE=1. Since the NDE is sent in a SAM that has a CRC check and the ACK/NACK channel does not have a CRC check, the MS determines that the NDE=1 is more reliable 622, ignoring the misread NACK and preparing to send a new packet 600.”)</i> • ¶73 (“<i>If the ACK/NACK and NDE disagreed...In this case, the BTS still does not properly receive 606 the retransmitted data and indicates this with a NACK 612 and the sending of and NDE of 0. However, the MS has an error and misreads 614 the NACK as an ACK, but correctly receives the NDE. The MS must then vote 616 on the reliability of the misread ACK or the NDE=0. Since the NDE is sent in a SAM that has a CRC check and the ACK/NACK channel does not have a CRC check, the MS determines that the NDE=0 is more reliable 618, ignoring the misread ACK and preparing to send the old packet 604. Thereafter, in the fourth row, the NDI bit is not flipped, and old data is sent 604 with the same NDI bit, which is now properly received by the BTS 606 and MS 610.”)</i> • See also ¶¶23-25, 67-69, 74-75, 78, Figures 7, 11, 12.
[2] The WTRU of claim 1, wherein the at least one transceiver and the processor are further configured to cause the WTRU to, in response to a determination to	<i>See [1].</i> Kuchibhotla further discloses wherein the at least one transceiver (see [1.a]) and the processor (see [1.b]) are further configured to cause the WTRU to, in response to a determination to retransmit the data block, retransmit the data block (e.g., “the MS determines that the NDE=0 is more reliable 618, ignoring the misread ACK and preparing to send the old packet 604. Thereafter...old data is sent 604 with the same NDI bit”). <u>E.g., Kuchibhotla:</u>

'247 Claims	Kuchibhotla in view of Liu
retransmit the data block, retransmit the data block.	<i>See</i> [1.pre]-[1.e]. Kuchibhotla further discloses that after “the MS determines...to send the old packet 604,” the MS retransmits the “old data...604” to the BTS. Kuchibhotla, ¶73, Figure 10. A POSITA would have understood, and at minimum found obvious, that the transceiver working with the processor (<i>see</i> [1.a]-[1.b]) is configured to cause the MS to retransmit the old data to the BTS in response to the processor’s determination to send the old data. Weide, ¶¶165-68. • ¶73 (<i>see</i> [1.e]) • Figure 10  <i>FIG. 10</i> <i>See also</i> Figure 8.
[3] The WTRU of claim 2, wherein the data block is retransmitted using physical channel resources	<i>See</i> [2]. Kuchibhotla further discloses that the data block is retransmitted (<i>see</i> [2]) using physical channel resources included in the uplink scheduling information (e.g., “SUB-FRAME MAP” included in the SAM “that describes a data transmission opportunity on the enhanced uplink channel”).

'247 Claims	Kuchibhotla in view of Liu
included in the uplink scheduling information.	<u>E.g., Kuchibhotla:</u> See [1.pre]-[1.e]. As discussed in [1.e] and [2], Kuchibhotla further discloses that the MS retransmits the data block based on the NDE included in the scheduling assignment message (SAM). See [1.e], [2]. Kuchibhotla further discloses that the “[SAM] to each mobile...describes a data transmission opportunity on the enhanced uplink channel,” and that “scheduling assignment 418” includes “a map of the allowed EUDCH sub-frame transmission intervals,” or “SUB-FRAME-MAP,” such as “a 2 ms sub-frame interval, for the next 10 ms transmission interval.” Kuchibhotla, ¶¶58, 48, Fig. 4. A sub-frame map identifies the intervals of time that are allocated to the WTRU for transmission. These time frames exist in the Physical Layer and thus constitute physical channel resources. <i>Id.</i>; Weide, ¶¶169-72. • Figure 4 (excerpted) “physical channel resources”  “uplink scheduling information” • ¶¶44, 58 (see[1.pre]) • ¶48 (“<i>The scheduling assignment 418 consists of the maximum allowed ‘power margin’ limit or target and a map of the allowed EUDCH sub-frame transmission</i>”)

'247 Claims	Kuchibhotla in view of Liu
	<i>intervals, such as a 2 ms sub-frame interval, for the next 10 ms transmission interval using a first forward link control channel 426.”)</i> • ¶¶55, 62, 73 (see [1.e]) • Figure 10 (see [2]) • See also ¶¶17, 52.
[4] The WTRU of claim 1, wherein the reception of the uplink scheduling information initiates retransmission of a negatively acknowledged (NACK’ed) data block.	<i>See [1].</i> Kuchibhotla further discloses that the reception of the uplink scheduling information initiates retransmission of a negatively acknowledged (NACK’ed) data block (e.g., “preparing to send the old packet 604,” which “the BTS...does not properly receive 606...and indicates this with a NACK 612,” when “NDE=0” “is received in a subsequent SAM”). <u>E.g., Kuchibhotla:</u> <i>See [1.pre]-[1.e].</i> Kuchibhotla further discloses that, upon receiving “NDE=0” in a SAM, the MS initiates retransmission of “old packet 604” that the BTS “does not properly receive...and indicates this with a NACK 612.” Kuchibhotla, ¶73; Weide, ¶¶173-75. • ¶¶55, 62, 73 (see [1.e]) • Figure 10

'247 Claims	Kuchibhotla in view of Liu
	FIG. 10 “retransmission of a negatively acknowledged (NACK'ed) data block”
[5] The WTRU of claim 1, wherein the uplink scheduling information includes physical channel resources.	<i>See</i> [1], [3]. Weide, ¶¶176-78.
[6] The WTRU of claim 1, wherein the uplink scheduling information is received from a primary cell and the WTRU transmits to the primary cell and at least one secondary cell.	<i>See</i> [1]. Kuchibhotla further discloses that the uplink scheduling information is received from a primary cell (e.g., cell serviced by a “scheduling BTS” that sends a “SAM”) and the WTRU transmits to the primary cell and at least one secondary cell (e.g. “MS is in soft handoff with a scheduling BTS” in a corresponding cell “and one or more non-scheduling BTSs” in their at least one corresponding cell, where “the non-scheduling BTS sends no SAM”). <u>E.g., Kuchibhotla:</u> <i>See</i> [1.pre]-[1.e].

'247 Claims	Kuchibhotla in view of Liu
	Kuchibhotla further discloses that “an MS is in soft handoff with a scheduling BTS and one or more non-scheduling BTSs in its active set.” Kuchibhotla, ¶¶49, 74. A MS transmits to all BTSs in an active set. Kuchibhotla, ¶¶43, 49, 53; Weide, ¶¶179-84. A “scheduling BTS” sends “a SAM to the MS,” whereas a “non-scheduling BTS sends no SAM.” Kuchibhotla, ¶74. Each BTS is located in a cell that provides communication services to each MS located in that cell. Kuchibhotla, ¶43, Figure 5; Weide, ¶182. As such, a POSITA would have understood that Kuchibhotla discloses that the MS transmits to: 1) a primary cell by communicating with the “scheduling BTS” located in its corresponding cell, and 2) at least one secondary cell by communicating with “one or more non-scheduling BTSs” in their corresponding one or more cells. Kuchibhotla, ¶¶43, 53, 74; Weide, ¶¶181-84. For example, Kuchibhotla discloses that an MS is serviced in a “3-way soft handoff” with the following BTSs in an “Active Set”: “BTSs 301, 303, and 304” associated with “sector b of cell 1,” “sector c of cell 3,” and “sector a of cell 4,” respectively. Kuchibhotla, ¶¶12, 49, 53, 74, Figures 3, 5; Weide, ¶¶183-84. Reading this together with Kuchibhotla’s compatible teachings in paragraph 74, a POSITA would have understood that Kuchibhotla discloses an embodiment where one of these BTSs is “the scheduling BTS” (e.g., BTS 301 in primary “cell 1”) and the other two BTSs are the “non-scheduling BTSs” (e.g., “BTSs 303” in secondary “cell 3,” BTS 304 in secondary “cell 4”). <i>Id.</i> • Figure 3

'247 Claims	Kuchibhotla in view of Liu
	FIG. 3 • Figure 5 FIG. 5 ¶43 (“Similar to communication system 100, <i>communication system 1000 includes multiple cells</i> (seven shown). Each cell is divided into multiple sectors (three shown for each cell—sectors a, b, and c). <i>A base station subsystem (BSS) 1001-1007 located in each cell provides communications service to each mobile station</i>

'247 Claims	Kuchibhotla in view of Liu
	<i>located in that cell.</i> Each BSS 1001-1007 includes multiple base stations, also referred to herein as <i>base transceiver stations (BTSs) or Node-Bs, which wirelessly interface with the mobile stations located in the sectors of the cell serviced by the BSS.</i>") • ¶49 (“Referring back to FIG. 5, communication system 1000 includes a soft handoff (SHO) procedure by which MS 1014 can be handed off from a first air interface whose quality has degraded to another, higher quality air interface. For example, <i>as depicted in FIG. 5, MS 1014, which is serviced by a BTS servicing sector b of cell 1, is in a 3-way soft handoff with sector c of cell 3 and sector a of cell 4. The BTSs associated with the sectors concurrently servicing the MS, that is, the BTSs associated with sectors 1-b, 3-c, and 4-a, are the Active Set of the MS. In other words, MS 1014 is in soft handoff (SHO) with the BTSs 301, 303, and 304, associated with the sectors 1-b, 3-c, and 4-a servicing the MS, which BTSs are the Active Set of the MS.</i> As used herein, the terms ‘Active Set’ and ‘serving,’ such as an Active Set BTS and a serving BTS, are interchangeable and both refer to a BTS that is in an Active Set of an associated MS.”) • ¶53 (“For example, as is known in the art, during reverse link communications, <i>the MS 1114 transmits frames to a plurality of BTSs 301, 303, 304.</i>”) • ¶74 (“Referring to FIGS. 11 and 12, a present situation is shown where <i>an MS is in soft handoff with a scheduling BTS and one or more non-scheduling BTSs in its active set.</i> In this instance, a separate ACK/NACK code is used for the non-scheduling BTS(s), i.e. <i>the non-scheduling BTS sends no SAM...The scheduling BTS also sends</i>

'247 Claims	Kuchibhotla in view of Liu
	<i>and “new data expected” indication (NDE=1) in a SAM to the MS.)</i> <i>See also ¶¶11, 12, 14, 54, 56, 63, 66, 76, 78, Claims 16, 20, Figures 1, 2.</i>
[7] The WTRU of claim 1, wherein the at least one transceiver and the processor are further configured to cause the WTRU to receive an ACK/NACK signal from the base station.	<i>See [1].</i> Kuchibhotla further discloses that the at least one transceiver (<i>see</i> [1.a]) and the processor (<i>see</i> [1.b]) are further configured to cause the WTRU to receive an ACK/NACK signal from the base station (<i>e.g.</i>, “the BTS...sen[ds] an ACK [or NACK] on the ACK/NACK channel,” which “the MS properly receives” or “misreads”; Figure 10). <u>E.g., Kuchibhotla:</u> <i>See [1.pre]-[1.e].</i> Kuchibhotla further discloses that “the BTS...sen[ds] an ACK [or a NACK] on the ACK/NACK channel,” which “the MS properly receives” or “misreads.” Kuchibhotla, ¶73. A POSITA would have understood, and at minimum found obvious, that the transceiver working with the processor (<i>see</i> [1.a]-[1.b]) is configured to cause the MS to receive an ACK/NACK signal from the BTS. Weide, ¶¶185-88. • ¶73 (<i>see</i> [1.e]) • Figure 10

'247 Claims	Kuchibhotla in view of Liu
	FIG. 10 “receive an ACK/NACK signal from the base station”
[11.pre] A method comprising:	Kuchibhotla discloses a method (e.g., “a method to enhance the reliability of the determination of ACK/NACK information”). <u>E.g., Kuchibhotla:</u> See [1.c]-[1.e]. Kuchibhotla discloses “a method to enhance the reliability of the determination of ACK/NACK information...through a novel technique of using...‘new data expected’ [(NDE)] indicators in a scheduling assignment message from a BTS to a communication device (MS).” Kuchibhotla, ¶40; Weide, ¶¶189-91. • ¶40 (see [1.d])
[11.a]-[11.c]	See [1.pre], [1.c]-[1.e]. Weide, ¶¶192-94.
[12]	See [11], [2]. Weide, ¶195.

'247 Claims	Kuchibhotla in view of Liu
[13]	<i>See</i> [12], [3]. Weide, ¶196.
[14]	<i>See</i> [11], [4]. Weide, ¶197.
[15]	<i>See</i> [11], [5]. Weide, ¶198.
[16]	<i>See</i> [11], [6]. Weide, ¶199.
[17]	<i>See</i> [11], [7]. Weide, ¶200.

E. Ground 6: Kuchibhotla in view of Liu and Lucent (Claims 8, 18)

1. Claims 8, 18

Claims 8 and 18 depend from claims 1 and 11, respectively, and further recite “wherein the scheduling information indicates a modulation and coding scheme.” As discussed in IX.A, **Lucent** discloses that the scheduling information indicates a modulation and coding scheme (e.g., “schedule grant message contains...modulation and coding scheme (MCS)”).

Lucent discloses “a schedule grant message transmitted by the Node-B” which contains a “modulation and coding scheme (MCS).” **Lucent**, 1; Weide, ¶¶207-09. A POSITA would have been motivated to apply **Lucent**’s teachings of “Node-B controlled scheduling” to **Kuchibhotla**’s system (as modified by **Liu**) to include the MCS in the scheduling assignment message sent by the base station to the MS. **Lucent** 1-2; Weide, ¶¶201-06. **Lucent** discloses that the UE “should...use the parameters dictated by Node-B in the schedule grant message for uplink data

transmission” because “allow[ing] the UE” to “select[] the parameters...can result in significant overheads.” Lucent, 2-3; Weide, ¶202. Furthermore, **Lucent** discloses that Node-B controlled scheduling has advantages over UE-controlled scheduling, such as “allow[ing] for better noise rise management, resource utilization,” and “exploit[ation] [of] multi-user diversity in the cell,” and “obviate[ing] the need for the associated signalling” by the UE, “thereby reducing uplink overheads.” Lucent, 1-3; Weide, ¶¶203-04.

Additionally, including the MCS in **Kuchibhotla’s** SAM would have been obvious to try because there are only two options—either the UE or a BTS selects the MCS. Weide, ¶205. And where the MCS is chosen by a BTS, there are a finite number of options for communicating that value in a HARQ process—e.g., in a SAM or an ACK/NACK communication. Lucent, 2; Kuchibhotla, ¶58, Figure 4; Weide, ¶205.

A POSITA would have had a reasonable expectation of success in including the MCS in **Kuchibhotla’s** SAM, as **Lucent** presents setting of MCS by a base station or a user equipment as alternative options. Lucent, 2-3; Weide, ¶206. As discussed above in §§IX.B, IX.D, **Kuchibhotla**, **Liu**, and **Lucent** are in the same field as the ’247 and are reasonably pertinent to the alleged problems identified in the ’247 of implementing efficient transmissions for H-ARQ. §§IX.B, IX.D.2;

Weide, ¶203. Thus, **Kuchibhotla in view of Liu and Lucent** renders obvious claims 8 and 18. Weide, ¶¶207-10.

F. Ground 7: Kuchibhotla in view of Liu, Lucent, and Das (Claims 9-10, 19-20)

1. Claims 9, 19

Claims 9 and 19 depend from claims 1 and 11, respectively, and further recite “wherein the transmitted data block has a first modulation and coding scheme (MCS) and the scheduling information indicates a second MCS, wherein the first MCS and the second MCS are different.” As discussed in Ground 6, **Kuchibhotla in view of Liu and Lucent** renders obvious that the scheduling information indicates a modulation and coding scheme (MCS). See §IX.E.1 ([8]/[18]).

As discussed in Grounds 3-4 (§IX.C), **Das discloses that the transmitted data block has a first modulation and coding scheme (MCS) and the retransmitted data block has a second MCS wherein the first MCS and the second MCS are different**, as recited by claims 9 and 19. As explained in §IX.C, a POSITA would have been motivated to modify **Lucent’s** Node-B controlled scheduling according to **Das’s** teachings of using different MCS values “for a retransmission than used in the original transmission.” Das, ¶9. As such, a POSITA would have been similarly motivated to implement **Kuchibhotla’s** SAM (as

modified by **Liu**), which includes an MCS, based on **Lucent**'s teachings as modified by **Das** to advantageously provide a more effective MCS scheme tailored to the "condition of the communication channel," as taught by **Das**. *E.g.*, Lucent, 1-3; Das, ¶ 9; Weide, ¶212; §§IX.C.

As discussed above in §§IX.B-IX.D, **Kuchibhotla**, **Liu**, **Lucent**, and **Das** are in the same field as the '247 and are reasonably pertinent to the alleged problems identified in the '247. *See* §§IX.B-IX.D; Weide, ¶213. Thus, **Kuchibhotla in view of Liu, Lucent, and Das** renders obvious claims 9 and 19. Weide, ¶¶211-14.

2. Claims 10, 20

Claims 10 and 20 depend from claims 9 and 19, respectively, and further recite **"the at least one transceiver and the processor are further configured to cause the WTRU to, in response to the determination to retransmit the data block, retransmit the data block [claim 2] using the second MCS [claim 9]"** and **"in response to a determination to retransmit the data block, retransmitting the data block [claim 12] using the second MCS [claim 19],"** respectively.

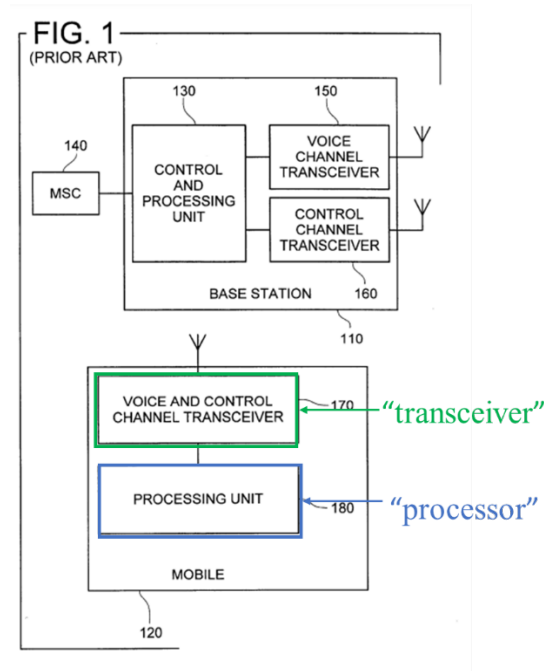
As discussed in §IX.D, **Kuchibhotla** discloses the features recited in claims 2 and 12. A POSITA would have been motivated to apply **Das**'s teachings of using a different MCS for retransmission than for the original transmission (*see* [9]/[19] above) to **Kuchibhotla**'s teachings (as modified by **Liu**) of retransmitting the data

block in response to a determination to retransmit the data block (*see* Ground 5, [2]/[12]) to advantageously provide a more effective MCS scheme that is tailored to the “condition of the communication channel” (Das, ¶9), yielding a system where **Kuchibhotla’s** WTRU (as modified by **Liu** and **Lucent**) retransmits the data block using a second MCS that is different from the first MCS that is used to make the original transmission in response to a determination to retransmit the data block. Weide, ¶¶215; *see also* §§IX.C, IX.F.1. Thus, **Kuchibhotla in view of Liu, Lucent, and Das** renders obvious claims 10 and 20. Weide, ¶215-16.

G. Grounds 8-14: Grounds 1-7 in further view of Rathonyi (Claims 1-20)

To the extent further disclosure is required for the recited “transceiver” and “processor” in [1.a] and [1.b] for Grounds 1-7, **Rathonyi** provides explicit teachings of transceivers and processors. Weide, ¶217.

Rathonyi discloses “a method and apparatus for minimizing overhead in packet re-transmission” in a “cellular radiotelephone system” using “hybrid ARQ” (HARQ) techniques, “including an exemplary base station 110 and a mobile station 120.” *Rathonyi*, 1:6-13, 6:35-40. The mobile station 120 includes a “transceiver 170” and a “processing unit 180.” *Id.*, 1:33-39, 15:64-66, Claim 9, Figure 1; Weide, ¶218.



Rathonyi is in the same field as the '247 and is reasonably pertinent to the alleged problems identified in the '247 of implementing efficient transmissions for H-ARQ. *E.g.*, Rathonyi, 1:6-10, 6:28-40; §§IX.A-IX.F; Weide, ¶219.

A POSITA would have been motivated to implement **Lucent's** UE or **Kuchibhotla's** mobile station (as modified by **Liu** and/or **Das**) to include a transceiver and processor according to **Rathonyi's** teachings of a "mobile station 120" with a "transceiver" and "processing unit" to, *e.g.*, "allow [the] mobile station to communicate with the base stations" and "evaluate[] the received control channel information," such as scheduling information to advantageously enable faster response times by the UE and allow handling multiple H-ARQ processes in parallel. Rathonyi, 1:33-39, 2:41-42, 3:16-21, 11:18-20; Weide, ¶¶220-21. Because

transceivers and processors have long been standard components used by UEs to transmit, receive, and process information, a POSITA would have had a reasonable expectation of success using **Rathonyi**'s transceiver and processor in implementing **Lucent**'s teachings optionally in view of **Liu** (*see* Grounds 1-2) and in further view of **Das** (*see* Grounds 3-4) or **Kuchibhotla**'s teachings in view of **Liu** (*see* Ground 5) and in further view of **Lucent** (*see* Ground 6) and **Das** (*see* Ground 7)—at minimum rendering obvious the elements reciting a “transceiver” or “processor.” Weide, ¶¶222-23.²³

X. SECONDARY CONSIDERATIONS

There is no evidence in the '247's prosecution history or elsewhere supporting any secondary considerations arguments, or evidence of nexus to any challenged Claim. *See generally* '247FH; Weide, ¶226. Indeed, as demonstrated by the prior art referenced herein, any purported solutions to problems or unexpected results in the '247 were already well known. Weide, ¶226. To the extent PO asserts the existence of any secondary considerations in its responses, Petitioner reserves the right to address any such evidence.

²³ **Grounds 1-2, and 5** in view of **Rathonyi** also render obvious this element as means-plus-function. Weide, ¶¶224-25.

XI. CONCLUSION

Substantial, new, and noncumulative technical teachings have been presented for Claims 1-20, which are obvious for the reasons set forth above. Weide, ¶¶227-32. There is a reasonable likelihood that Petitioner will prevail as to the Claims. *Inter partes* review of the Claims is accordingly requested.

Respectfully submitted,

Dated: August 11, 2023

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CERTIFICATE OF COMPLIANCE

Pursuant to §42.24(d), the undersigned certifies that the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 10,869,247 contains, as measured by the word-processing system used to prepare this paper, 13,757 words. This word count does not include the items excluded by §42.24 as not counting towards the word limit.

Respectfully submitted,

Dated: August 11, 2023

By: /Daniel W. Richards/
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CERTIFICATE OF SERVICE

I hereby certify that on August 11, 2023, I caused a true and correct copy of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 10,869,247 and supporting exhibits to be served via Priority Mail Express on the Patent Owner at the following correspondence address of record as listed on PAIR:

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