

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau

(43) International Publication Date  
12 April 2018 (12.04.2018)



(10) International Publication Number  
**WO 2018/067845 A1**

(51) International Patent Classification:  
**H04L 1/18** (2006.01)

(21) International Application Number:  
PCT/US2017/055385

(22) International Filing Date:  
05 October 2017 (05.10.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
62/405,783 07 October 2016 (07.10.2016) US  
15/602,751 23 May 2017 (23.05.2017) US

(71) Applicant: **QUALCOMM INCORPORATED** [US/US];  
ATTEN: International IP Administration, 5775 Morehouse  
Drive, San Diego, California, US 92121-1714 (US).

(72) Inventors: **RICO ALVARINO, Alberto**; c/o QUAL-  
COMM INCORPORATED, 5775 Morehouse Drive, San

Diego, California 92121-1714 (US). **GAAL, Peter**; c/o  
QUALCOMM INCORPORATED, 5775 Morehouse Drive,  
San Diego, California 92121-1714 (US). **CHEN, Wanshi**;  
c/o QUALCOMM INCORPORATED, 5775 Morehouse  
Drive, San Diego, California 92121-1714 (US).

(74) Agent: **HODGES, Jonas J.** et al.; c/o ARENT FOX LLP,  
1717 K Street NW, Washington, District of Columbia  
20006-5344 (US).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,  
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,  
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,  
HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,  
KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,  
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,  
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,

(54) Title: UPLINK VOICE AND VIDEO ENHANCEMENTS

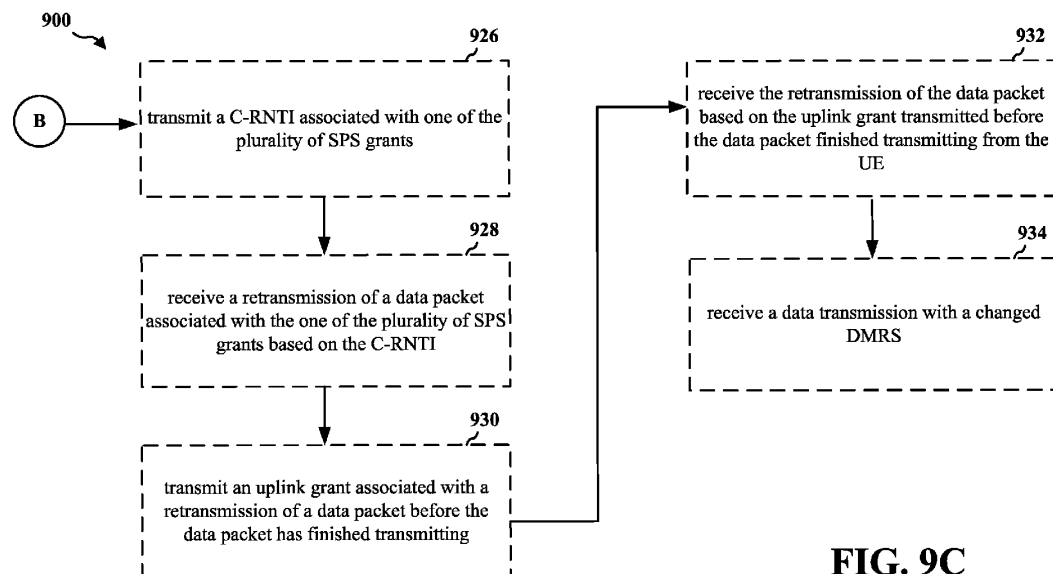


**FIG. 9C**

(57) **Abstract:** The present disclosure may provide technique(s) to configure a UE for asynchronous UL HARQ transmission. In an aspect of the disclosure, a method, a computer-readable medium, and an apparatus are provided. The apparatus may perform an initial RRC configuration procedure. The apparatus may transmit a first RRC message. The first RRC message may indicate that the UE supports a VoLTE mode. The apparatus may receive a second RRC message from the base station. The second RRC message may configure the UE to operate in VoLTE mode. The apparatus may monitor a CSS for a first uplink grant in first DCI. The first uplink grant may not contain an uplink HARQ ID field. The apparatus may monitor a USS for a second uplink grant in second DCI. The second uplink grant may be associated with asynchronous uplink HARQ, and the second uplink grant may include a HARQ ID field.

[Continued on next page]

WO 2018/067845 A1

SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,  
TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

**(84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Published:**

- *with international search report (Art. 21(3))*