

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS INC.,

Petitioner,

v.

PANTECH WIRELESS, LLC,

Patent Owner.

Case IPR2023-01267

U.S. Patent No. 9,313,809

DECLARATION OF FRIEDHELM RODERMUND
IN SUPPORT OF A PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 9,313,809

TABLE OF CONTENTS

	Page
I. INTRODUCTION AND ENGAGEMENT	1
II. BACKGROUND AND QUALIFICATIONS	4
III. SUMMARY OF MY OPINIONS	8
IV. OVERVIEW OF 3GPP BUSINESS PRACTICES	9
A. Overview of 3GPP.....	9
B. 3GPP FTP Server and Website	11
1. The Internet Archive	14
C. 3GPP Working Groups.....	16
D. Technical Contributions to 3GPP Working Groups	16
E. 3GPP Technical Specifications	22
F. 3GPP Email Exploders and Archives	34
G. 3GPP Working Group Meetings	38
V. PUBLIC AVAILABILITY OF SPECIFIC DOCUMENTS.....	40
A. T-doc R2-073254 (Ex. 1008)	40
1. Authentication.....	40
2. Distribution Via 3GPP_TSG_RAN_WG2 Reflector	41
3. Available On 3GPP Public FTP Server	42
4. Distribution at RAN WG2 Meeting No. 59	46
5. Conclusion	47
B. TS 25.321 V7.5.0 (Ex. 1009)	48
1. Authentication.....	48
2. Publication by 3GPP and ETSI.....	48
3. Available On 3GPP Public FTP Server and 3GPP Website.....	50
4. Conclusion	58
C. TS 25.331 V7.5.0 (Ex. 1011)	58
1. Authentication.....	58

Declaration of Friedhelm Rodermund

	2.	Publication by 3GPP and ETSI.....	59
	3.	Available On 3GPP Public FTP Server and 3GPP Website.....	61
	4.	Conclusion	68
VI.		AVAILABILITY FOR CROSS-EXAMINATION	69
VII.		RIGHT TO SUPPLEMENT.....	69
VIII.		SIGNATURE	69

Declaration of Friedhelm Rodermund

I, Friedhelm Rodermund, do hereby declare as follows:

I. INTRODUCTION AND ENGAGEMENT

1. I have been retained in this matter by the Petitioner to provide testimony regarding the standard business practices of 3rd Generation Partnership Project (“3GPP”) for record keeping and publishing technical specifications, change request proposals, reports, and other documents developed during the course of standards activities carried out by 3GPP and the European Telecommunications Standards Institute (“ETSI”).¹

2. I have been asked to provide my opinions regarding the authenticity and date each of the following 3GPP documents was made available to the public, and the manner in which a person of ordinary skill in the art (POSITA) exercising reasonable diligence would have been able to locate the documents:

- T-doc R2-073254, which represents a 3GPP document with the title “Further discussion on enhanced CELL_FACH in REL8” (hereinafter “R2-073254”) (Ex. 1008)

¹ Each of Exs. 1051-1101 is a true and correct copy of the webpage or document available at the hyperlink associated with the exhibit, as identified herein, except that each page includes an exhibit label and page numbers on the bottom right corner added by counsel. Although the format of some screen captures may be arranged in a different manner than their corresponding exhibits, they both reflect the same information for purposes of my opinions herein. Moreover, the screen captures herein may reflect an excerpt of a larger webpage or document, with the full webpage or document available in the referenced exhibit.

Declaration of Friedhelm Rodermund

- Version 7.5.0 of technical specification 3GPP TS 25.321, which represents a 3GPP document with the title “Technical Specification Group Radio Access Network; Medium Access Control (MAC) protocol specification (Release 7)” (hereinafter “TS 25.321 V7.5.0”) (Ex. 1009)
- Version 7.5.0 of technical specification 3GPP TS 25.331, which represents a 3GPP document with the title “Technical Specification Group Radio Access Network; Radio Resource Control (RRC); Protocol specification (Release 7)” (hereinafter “TS 25.331 V7.5.0”) (Ex. 1011)

3. I have been informed that Petitioner is asserting that a person of ordinary skill in the art (POSITA) in 2007 would have had a bachelor’s degree in electrical and computer engineering, computer science, or the equivalent thereof, and, least two years of experience with networking and wireless communications systems. I further understand that the Patent Owner has not yet provided its proposed definition of a POSITA.²

4. As an ETSI Project Manager and Secretary, from June 1998 to December 2004, I have personal knowledge of 3GPP’s standard business and records keeping practices. I continued following 3GPP’s work ever since. Thus,

² Regardless, for the reasons discussed herein, a person having a bachelor’s degree in an engineering discipline or in computer science in 2007 would have had the requisite computer skills to locate materials using the available tools on the 3GPP website and FTP server.

Declaration of Friedhelm Rodermund

based on my experience, personal knowledge, and review of 3GPP's business records, I am able to testify regarding the authenticity of certain documents published by 3GPP and the timing of their publication.

5. I am also knowledgeable about document management practices and the usage of email reflectors in 3GPP TSG RAN WG2. This is due to the fact that all 3GPP working groups used the same document repository on <ftp.3gpp.org> and all working groups use the same email exploder tool. Thus, I'm able to testify regarding the availability and authenticity of any 3GPP documents.

6. I am being compensated for my time spent on this matter at my usual rate of €450 per hour. My fee is not contingent on the outcome of this or any matter, or on the content of any of the testimony I give in this declaration. I have no financial interest in the Petitioner. I have been informed that Pantech Wireless, LLC ("Pantech" or "Patent Owner") is the current assignee of U.S. Patent No. 9,313,809 ("the '809 Patent") (Ex. 1001). I have no financial interest in the Patent Owner or the '809 patent.

7. In forming my opinions, I have considered the cited exhibits, including the exhibits identified in Appendix B, and my academic and professional training and experience in the field of wireless communications and standards development as described herein. While my opinions are organized into various chapters, my opinions expressed herein are supported by the entirety of the declaration.

II. BACKGROUND AND QUALIFICATIONS

8. I have more than 20 years of experience working with standards development organizations including 3GPP, ETSI, and the Open Mobile Alliance (“OMA”). I have particular experience with the development of standards related to cellular telecommunications, including the standards for the Universal Mobile Telecommunications System (“UMTS”), Long Term Evolution (“LTE”), and 5G, which are all standards developed by the 3GPP.

9. I attended the University of Technology Aachen in Aachen, Germany, where I performed graduate studies in Electrical Engineering with a focus on telecommunications technologies (“Dipl.-Ing. TH” degree). I also attended the University of Technology Trondheim in Trondheim, Norway, and completed my Diploma thesis, “Design of a dual processor computer for digital signal processing in power electronics,” in 1993.

10. From December 1993 to June 1998, I worked at Mannesmann Mobilfunk as a System Engineer and Project Manager in Quality Assurance and Technical Standards. One of my responsibilities was to ensure by managing and performing related test activities that cellular network equipment was compatible with the Global System for Mobile Communications (“GSM”) standard developed by ETSI. During that time, I also started working as a standards delegate. I attended

Declaration of Friedhelm Rodermund

my first ETSI meeting in 1996 (although I was already following ETSI developments from 1992 during my studies).

11. From June 1998 to December 2004, I worked at ETSI as a project manager for various ETSI Special Mobile Group (“SMG”) and 3GPP working groups. First, I served as a secretary of SMG4 “Data Services” and SMG8 “Base Stations Testing.” Then, as a project manager with the ETSI Mobile Competence Center (“MCC”), I supported establishing 3GPP as the new international standards development organization for cellular telecommunications. One of my roles was acting as Secretary for 3GPP’s Technical Specifications Group Terminals, Working Group (“T2”), the group which played a leading role in the creation of standards for Multimedia such as the Multimedia Messaging Service (“MMS”).

12. Later, I was a secretary of the highest-level Technical Specifications Group Terminals, which, in addition to other things, was responsible for the development of test specifications including tests for the radio interface.

13. I edited all technical specifications produced by my working groups and presented results to the parent body for approval. I attended all meetings (apart from some sub-working group meetings) and was also responsible for compiling meeting reports, for handling all the meeting documents, and managing the work plan. It was also my role to guide the groups and to advise the chairmen regarding 3GPP working methods and procedures including document handling, and to make sure delegates

Declaration of Friedhelm Rodermund

were aware of their company's obligations under the 3GPP Intellectual Property Rights policy.

14. As part of my responsibilities at ETSI, I acted as a 3GPP custodian of records by personally managing 3GPP's public File Transfer Protocol (FTP) folders, which I used to make publicly available various 3GPP documents, including versions of 3GPP specifications, technical reports, liaison statements, change requests, contributions, agendas, meeting reports, and other 3GPP documents from my working groups. I am also knowledgeable about document management practices used in other working groups and within 3GPP in general with regard to making documents publicly available through the same public FTP server of 3GPP.

15. Since I left ETSI as a staff member in 2005, I have been continuously involved in standardization activities, including with OMA, ETSI, and 3GPP. Since 2017, I also have been attending the ETSI Intellectual Property Rights ("IPR") Special Committee, which is responsible for the maintenance of the ETSI IPR Policy.

16. After I left ETSI, I worked from January 2005 to October 2014 at Vodafone, first as a Project Manager for Mobile Broadcast Standards, and then as Vice Chairman of the Device Management working group of the Open Mobile Alliance, and then as a Senior Standards Strategist, all with responsibilities as described on my curriculum vitae. At Vodafone, I was deeply involved in standards

Declaration of Friedhelm Rodermund

work with ETSI and 3GPP and other standards setting organizations, including as a delegate to 3GPP SA1 “Services.” As part of my responsibilities, I attended selected 3GPP meetings, submitted documents to 3GPP, used 3GPP resources (including 3GPP’s FTP server) extensively, and remained knowledgeable about 3GPP policies and procedures with regard to document management and public availability. I was also involved in the creation of patents, defense activities related to patent litigations, and patent evaluation, mostly in the context of standards development.

17. Since leaving Vodafone in 2014, I have performed consulting work regarding Internet of Things (IoT) and Machine to Machine (M2M) technology and standards, first at Friedhelm Rodermund Consulting and then as the Founder and Director of IOTECC GmbH. In connection with my work, I regularly deal with standards such as OMA’s Lightweight M2M (LwM2M) and 3GPP’s LTE, Narrowband IoT (NB-IoT) and 5G standards. And I have extensively used 3GPP resources and have remained knowledgeable about 3GPP policies and procedures with regard to document management and public availability.

18. I also provide consulting services related to patents, in particular around 3GPP Standard Essential Patents (“SEPs”), and I have worked as an expert witness on a number of occasions. I continue to closely follow the maintenance of the ETSI IPR Policy as a delegate to the ETSI IPR Special Committee. Furthermore, I am

Declaration of Friedhelm Rodermund

conducting a seminar on SEPs and the Internet of Things at the Technical University of Ilmenau, Germany.

19. At the time of writing this declaration, I am following – including attending selected meetings – the following standards committees: ETSI oneM2M, ETSI IPR Special Committee, OMA, and 3GPP.

20. A copy of my curriculum vitae, which includes a detailed description of my experience and education, is attached as Appendix A. A list of litigation matters on which I have worked over the last five years is also included in my curriculum vitae.

III. SUMMARY OF MY OPINIONS

21. It is my opinion that Ex. 1008 is an authentic copy of 3GPP T-doc R2-073254 that was disseminated on August 13, 2007 via email to at least 900 interested members of the public subscribed to the 3GPP_TSG_RAN_WG2 email reflector, including delegates of the 3GPP member companies; uploaded and made available via the 3GPP FTP server to the general public where interested members of the public, such as POSITAs, would have been able to locate the reference exercising reasonable diligence by August 24, 2007; and made available to at least 183 attendees of the RAN WG2 #59 meeting, by no later than August 24, 2007.

22. It is my opinion that Ex. 1009 is an authentic copy of TS 25.321 V7.5.0 that was published by 3GPP by no later than July 17, 2007; published by ETSI no

later than July 23, 2007; and was uploaded and made available via the 3GPP FTP server to the general public where interested members of the public, such as POSITAs, would have been able to locate the reference exercising reasonable diligence by July 17, 2007.

23. It is my opinion that Ex. 1011 is an authentic copy of TS 25.331 V7.5.0 that was published by 3GPP no later than July 31, 2007; published by ETSI by August 14, 2007; and was uploaded and made available via the 3GPP FTP server to the general public, where interested members of the public, such as POSITAs, would have been able to locate the reference exercising reasonable diligence by July 31, 2007.

IV. OVERVIEW OF 3GPP BUSINESS PRACTICES

A. Overview of 3GPP

24. Unless otherwise noted, the foregoing and following is an accurate description of 3GPP general practices from 1998 to the present, regardless of whether I use the present or past tense to describe those practices.

25. 3GPP was established in 1998 by a group of telecommunications standard development organizations from Japan, Korea, China, Europe, and the United States to jointly develop worldwide standards for mobile telecommunications. Today, 3GPP consists of seven partners: Association of Radio Industries and Businesses, Japan (“ARIB”), Alliance for Telecommunications

Declaration of Friedhelm Rodermund

Industry Solutions, USA (“ATIS”), China Communications Standards Association (“CCSA”), European Telecommunications Standards Institute (“ETSI”), Telecommunications Standards Development Society, India (“TSDSI”), Telecommunications Technology Association, Korea (“TTA”), and Telecommunication Technology Committee, Japan (“TTC”). In addition to being one of the founding partners, ETSI hosts the Mobile Competence Centre (“MCC”), which provides administrative and technical support for the day-to-day work of 3GPP. Furthermore, ETSI manages 3GPP’s IT services such as the 3GPP website, FTP server, and email exploders.

26. 3GPP is the world’s leading organization for developing and maintaining cellular telecommunications standards. When ETSI formed 3GPP to develop the next generation of 3G cellular standards in 1998, 3GPP adopted several of the business practices of ETSI and continues to use those practices today. As noted above and in my curriculum vitae, I began working for 3GPP, as part of my work at ETSI, the European-based organizational partner of 3GPP.

27. In the ordinary course of its regularly conducted business activities, and pursuant to its standard business practices, 3GPP publishes technical specifications, proposals, reports, and other documents related to the development of cellular telecommunications standards. Such documents are published for the purposes of discussion and establishment of industry standards for cellular telecommunications.

Declaration of Friedhelm Rodermund

This has been 3GPP's ordinary course of business since I began working at ETSI in 1998.

28. By 1999, at least 100 companies were members of 3GPP (719 companies by December 2020), ranging from Bosch to Ericsson to Nokia to LGE to Samsung and generally including those interested in the discussion, creation, and adoption of cellular telecommunications standards, including UMTS and LTE. Each of these companies typically delegated multiple individuals to regularly participate in 3GPP meetings.

29. Shortly after 3GPP's foundation in December 1998, its FTP server and email exploder lists became well-known to persons interested in the cellular telecommunications industry, including POSITAs, as a source of public information regarding industry standards and technological advances. 3GPP encourages the open and free exchange of information. Therefore, as discussed below, 3GPP materials, including those on the FTP server and shared by the email reflectors, T-docs, technical specifications, and other meeting materials such as agendas and meeting minutes are shared freely without any expectation of confidentiality.

B. 3GPP FTP Server and Website

30. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, all draft technical specifications, proposals, reports, and other temporary documents to be discussed or

Declaration of Friedhelm Rodermund

considered in relation to 3GPP's telecommunications standards activities were, and continue to be, assigned a temporary document number and made publicly available and without restriction, including on the FTP server associated with the 3GPP website, currently residing at <ftp.3gpp.org>. Such documents are referred to as "T-docs." Final versions of the technical specifications also were, and continue to be, publicly available from that same FTP server.

31. As early as December 1998, 3GPP's FTP server was freely accessible to the general public at <ftp.3gpp.org> or using the corresponding web interface to the server at <http://ftp.3gpp.org> or <http://3gpp.org/ftp/> with no login, password, or membership requirement.

32. The timestamp on 3GPP's FTP server shows the date when the document was uploaded the last time. Thus, the timestamp shows the latest possible date the document became publicly available and accessible on 3GPP's FTP server. The given document might have been available earlier and the original timestamp might have been overwritten because the document was uploaded again. According to my experience, this is something which happened occasionally. Thus, the FTP timestamp is reliable as the latest possible upload date, but one cannot determine whether it represents the first upload of a document to the FTP server.

33. 3GPP's working practice to store their documents on its FTP server, as described above, has not changed over time. Starting from the first 3GPP meetings

Declaration of Friedhelm Rodermund

in 1998 until present, all WGs and plenary meetings are represented by dedicated meeting folders on the FTP server. These meeting folders include the documents discussed at the meetings. Both the folders and the documents are accessible to the public. Almost every week, a new meeting folder with the respective documents is added. In addition to the plenary and WG meeting folders, and some other folders, there is also the “Specs” folder, which holds all 3GPP specifications including “snapshot” and archive folders. Since the early days of 3GPP a new folder is added inside the “Specs” folder after each TSG plenary meeting to hold the latest versions of specifications approved at those TSG plenary meetings. This is still 3GPP’s working practice today; thus, this practice has not changed over time.

34. 3GPP maintains a set of publicly available documents³ providing further details on its way of working:

- 3GPP Working Procedures
- Vocabulary for 3GPP Specifications 3GPP TR 21.905
- Working Methods 3GPP TR 21.900
- Specification Drafting Rules 3GPP TR 21.801

³ All available from <https://www.3gpp.org/delegates-corner/3gpp-working-procedures>. These documents are also available on the 3GPP FTP server.

1. The Internet Archive

35. The Internet Archive is a non-profit organization that is not associated with 3GPP or ETSI.⁴ The Internet Archive, and its Wayback Machine tool, captures and archives copies of webpages that are freely available on the Internet. The Internet Archive “automatically stores copies of files available via the Internet, [with] each file preserved as it existed at a particular point in time.”⁵

36. “The Internet Archive assigns a URL on its site to the archived files in the format `http://web.archive.org/web/[Year in yyyy][Month in mm][Day in dd][Time code in hh:mm:ss]/[Archived URL]` aka an ‘extended URL’. Thus, the extended URL `http://web.archive.org/web/19970126045828/http://www.archive.org/` would be the URL for the record of the Internet Archive home page HTML file (`http://www.archive.org/`) archived on January 26, 1997 at 4:58 a.m. and 28 seconds (1997/01/26 at 04:58:28).”⁶

37. In the course of my work authenticating and establishing the public availability of 3GPP materials, I regularly consult the Internet Archive as further evidence of the authenticity and availability of 3GPP materials. Internet Archive

⁴ <https://archive.org/about/>

⁵ <https://archive.org/legal/affidavit.php> (Ex. 1051 ¶4)

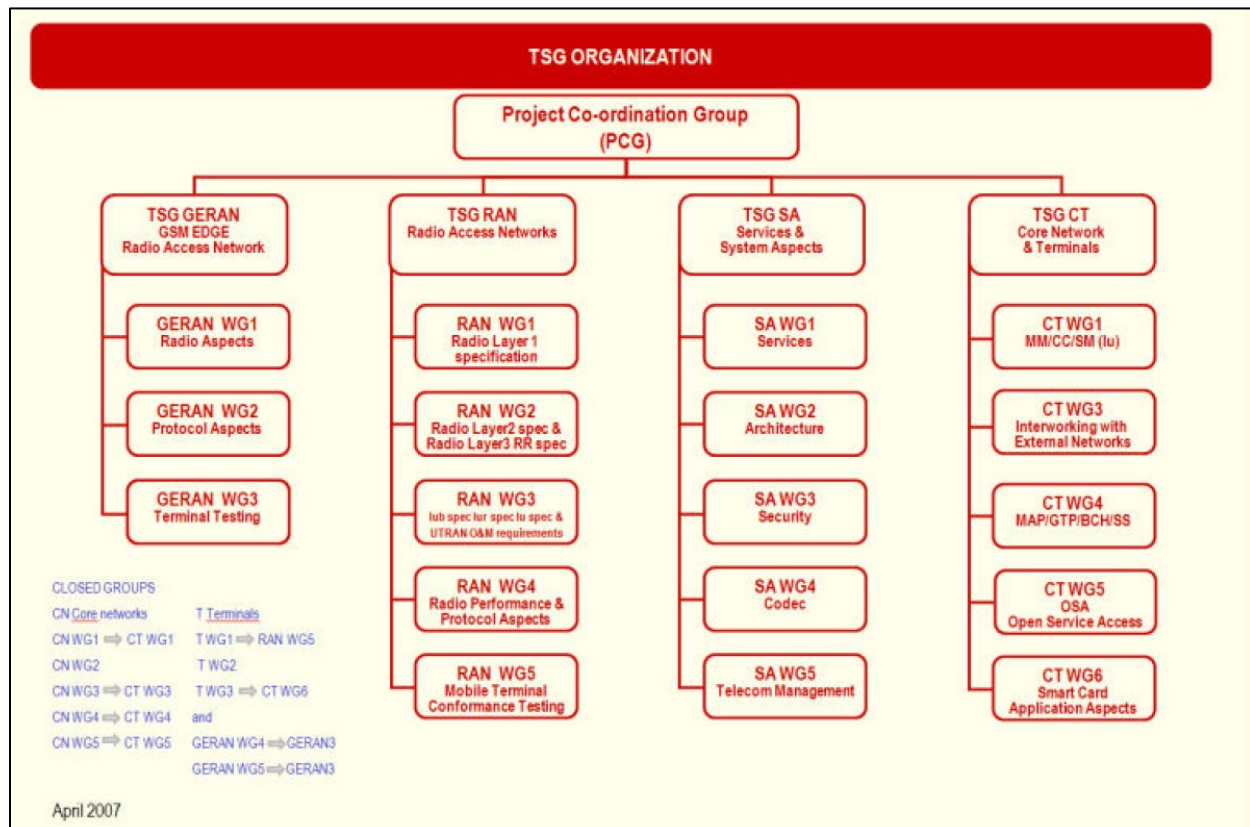
⁶ <https://archive.org/legal/affidavit.php> (Ex. 1051 ¶5).

materials are the type of evidence that experts in the field of authenticating and establishing the public availability of 3GPP materials regularly rely upon.

38. The existence of an archived copy of a webpage or document from the 3GPP website in the Internet Archive provides independent evidence that the webpage or document was accessible at the identified location as of the date it was archived by the Internet Archive. On the other hand, the absence of a reference from the Internet Archive does not mean that the webpage or document was not available, because the Internet Archive is not capable of constantly crawling and archiving every webpage on the Internet. In circumstances where a webpage or file has been archived by the Internet Archive, I rely on the business records of 3GPP to authenticate and establish the public availability of the reference and rely on the Internet Archive to confirm 3GPP's business records. Otherwise, I rely on the business records of 3GPP to authenticate and establish the public availability of the reference. In circumstances where a 3GPP webpage or file available from 3gpp.org is different than the version that was available in the past, I may rely on the Internet Archive's capture of the webpage or file from the relevant timeframe to reflect the information that would have been available from 3gpp.org at that time.

C. 3GPP Working Groups

39. The names and the structure of 3GPP working groups, as of 2007, is reproduced below⁷:



D. Technical Contributions to 3GPP Working Groups

40. Each Technical Specification Group (TSG) or Working Group, according to 3GPP's standard business practices, adopts a structured numbering system for the documents associated with their meetings, and those systems follow a consistent numbering system as shown in the following example: xminnnzzzz. The

⁷ <https://web.archive.org/web/20070705003208/http://www.3gpp.org/tb/home.htm> (Ex. 1052).

Declaration of Friedhelm Rodermund

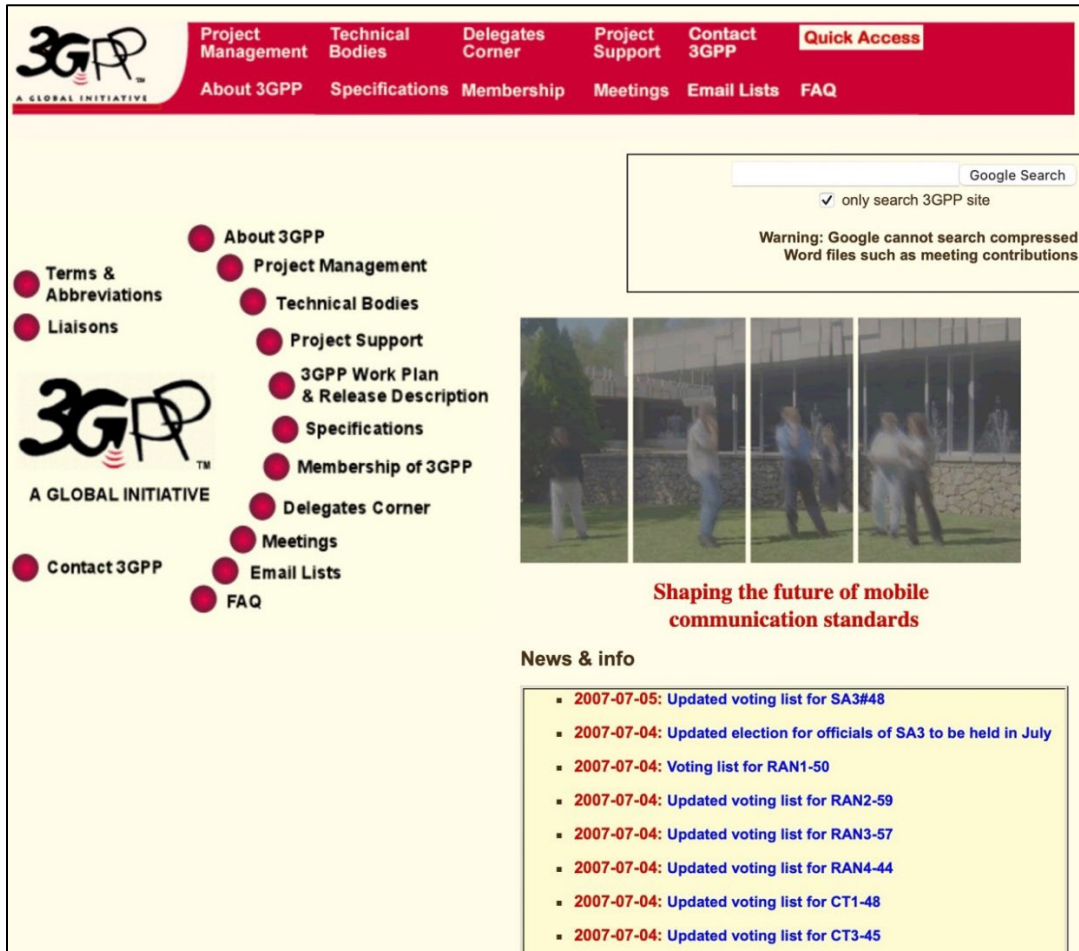
numbering system normally comprises five logical elements: (1) x: a single letter corresponding to the TSG; wherein in 2002 x was one of R (Radio Access Network), C (Core Network), S (Service and System Aspects), G (GSM/EDGE Radio Access Network), or T (Terminals); (2) m: a single character corresponding to the Working Group identity (typically 1, 2, 3, etc.) or, in the case of the TSG itself, the letter “P”; (3) i: a hyphen character “-”; (4) nn: the calendar year of the meeting to which the document was submitted; and (5) zzzz: a running number (some working groups use 5 digits). During the early years of 3GPP some working groups used a hyphen character between the calendar year and the running number. The T-doc number serves as a unique identifier for the document.

41. As part of the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, T-docs are uploaded to 3GPP’s FTP server and website before the meeting where they are to be discussed. Documents created or revised during the course of a meeting are first stored on a local server at the meeting location, and then uploaded at the latest during the week following the meeting (e.g., the meeting report of the meeting is typically published for review during the week following the meeting).

42. One possible way for a member of the public, such as a POSITA, to find specific documents in 2007 would have been through the 3GPP website, www.3gpp.org. Members of the public interested in cellular and wireless

communications in 2007 would have been independently aware of the 3GPP website as the definitive source for wireless standard development.

43. The homepage of 3GPP as of December 2007 as recorded by the Internet Archive is shown below:⁸



44. Starting from the 3GPP homepage, one way of finding the desired information and documents was to discover the technical responsibilities of the different 3GPP working groups by clicking on “Technical Bodies”. This led to the

⁸ <https://web.archive.org/web/20070707102325/http://www.3gpp.org/> (Ex. 1053).

Declaration of Friedhelm Rodermund

webpage shown above (paragraph 39) where a POSITA would have observed that RAN WG2 has responsibility for “Radio Layer 2 spec & Radio Layer 3 RR spec”. Clicking on “RAN WG2” led to a page titled “TSG RAN WG2 (Radio layer 2 and Radio layer 3 RR)” showing several links leading to further information about RAN WG2 (terms of reference, work items, meetings, email exploder list, specifications, documents, chairpersons and secretary contacts), as shown below:⁹

3GPP
A GLOBAL INITIATIVE

Project Management | Technical Bodies | Delegates Corner | Project Support | Contact 3GPP | Quick Access

About 3GPP | Specifications | Membership | Meetings | Email Lists | FAQ

CN	CN1	CN2	CN3	CN4	CN5
CT	CT1	CT3	CT4	CT5	CT6
GERAN	GERAN1	GERAN2	GERAN3	GERAN4	GERAN5
RAN	RAN1	RAN2	RAN3	RAN4	RAN5
SA	SA1	SA2	SA3	SA4	SA5
T	T1	T2	T3		

TSG RAN WG2 (Radio layer 2 and Radio layer 3 RR)

Overview:

TSG RAN WG2 is in charge of the Radio Interface architecture and protocols (MAC, RLC, PDCP), the specification of the Radio Resource Control protocol, the strategies of Radio Resource Management and the services provided by the physical layer to the upper layers.

Useful links and information

****New: Elections for officials of TSG RAN WG2****

About RAN2	List of elected officials	Meetings	Next meeting information & previous meeting reports and documents
	Terms of Reference		Liaisons Statements
Documents	Documents area		Full RAN2 meeting calendar
	Specifications	General info	Email exploder lists
	Work items		Contact RAN2 @

Last update:
2007-06-28: Election information added
2006-01-09: Election information removed
2005-03-24: Election information page link added
2005-01-10: Link to meetings page changed
2004-11-25: Next meeting information updated

45. For a member of the public, such as a POSITA, interested in learning more about the activities of the working group, the “Document area” link led to

⁹ <https://web.archive.org/web/20070710032216/http://www.3gpp.org/tb/RAN/RAN2/RAN2.htm> (Ex. 1054).

Declaration of Friedhelm Rodermund

3GPP's folder for RAN WG2 (named WG2_RL2 where "RL2" stands for radio layer 2) hosted on 3GPP's FTP server. Besides other documents such as document indexes (e.g. "R2_2005"), the folder largely consists of numbered meeting folders which include the documents of specific meetings. Below is an image of the folder structure as of July 2007:¹⁰

www.3gpp.org - /ftp/tsg_ran/WG2_RL2/			
[To Parent Directory]			
29 March 2007	22:17	<dir>	Change Requests
29 March 2007	22:17	<dir>	Invitation
15 May 2007	18:43	<dir>	Outgoing Liaisons
30 April 2004	14:00	95515	R2_1999.zip
21 December 2000	20:03	120168	R2_2000.zip
04 January 2002	19:12	137260	R2_2001.zip
21 January 2003	15:07	160005	R2_2002.zip
24 November 2003	11:08	124992	R2_2003.zip
01 December 2004	10:45	141308	R2_2004.zip
14 November 2005	13:57	175578	R2_2005.zip
29 March 2007	22:18	<dir>	Specifications
29 March 2007	22:18	<dir>	TSGR2_01
29 March 2007	22:18	<dir>	TSGR2_02
29 March 2007	22:18	<dir>	TSGR2_03
29 March 2007	22:18	<dir>	TSGR2_04
29 March 2007	22:18	<dir>	TSGR2_05
29 March 2007	22:19	<dir>	TSGR2_06
29 March 2007	22:19	<dir>	TSGR2_07
29 March 2007	22:19	<dir>	TSGR2_08
29 March 2007	22:19	<dir>	TSGR2_09
29 March 2007	22:20	<dir>	TSGR2_10
29 March 2007	22:20	<dir>	TSGR2_11
29 March 2007	22:20	<dir>	TSGR2_12
29 March 2007	22:20	<dir>	TSGR2_13
29 March 2007	22:20	<dir>	TSGR2_14
29 March 2007	22:21	<dir>	TSGR2_15
29 March 2007	22:21	<dir>	TSGR2_16
29 March 2007	22:21	<dir>	TSGR2_17
29 March 2007	22:21	<dir>	TSGR2_18
29 March 2007	22:22	<dir>	TSGR2_19
29 March 2007	22:22	<dir>	TSGR2_20
29 March 2007	22:22	<dir>	TSGR2_21
29 March 2007	22:22	<dir>	TSGR2_22
29 March 2007	22:23	<dir>	TSGR2_23
29 March 2007	22:23	<dir>	TSGR2_24
29 March 2007	22:23	<dir>	TSGR2_25
29 March 2007	22:23	<dir>	TSGR2_26
29 March 2007	22:24	<dir>	TSGR2_27
29 March 2007	22:24	<dir>	TSGR2_28
29 March 2007	22:24	<dir>	TSGR2_29
29 March 2007	22:24	<dir>	TSGR2_30
29 March 2007	22:25	<dir>	TSGR2_31
29 March 2007	22:25	<dir>	TSGR2_32

¹⁰ https://web.archive.org/web/20070701154418/http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/ (Ex. 1055).

46. Each meeting folder has dedicated folders for “Agenda”, “Documents”, “Invitation”, and “Minutes”, as shown below for meeting number 55:¹¹

www.3gpp.org - /ftp/tsg_ran/WG2_RL2/TSGR2_55/				
[To Parent Directory]				
29 March 2007	21:33	<dir>	Agenda	
05 October 2006	16:27	243944	DocumentList.htm	
29 March 2007	21:33	<dir>	Documents	
29 March 2007	21:33	<dir>	Invitation	
29 March 2007	21:33	<dir>	Minutes	
16 October 2006	08:30	56320	RAN2-55_Tdoc.xls	

47. As one example, it would have been straightforward for members of the public, including POSITAs, to identify documents related to specific technical topics via the report of a meeting which was able to be downloaded from the “Reports” folder. The meeting report includes information about all documents registered for a meeting, including the T-doc number, title describing the subject matter of the contribution, the author(s), the status of the document, and any related discussion of the T-doc from the meeting. The T-doc numbers enable any person to retrieve the document from the “Docs” folder and study and share the document without restrictions.

48. Furthermore, members of the public, including POSITAs, would have been informed of the activities of the working groups at specific times by looking at

¹¹ https://web.archive.org/web/20071129220816/http://www.3gpp.org:80/ftp/tsg_ran/WG2_RL2/TSGR2_55/ (Ex. 1056).

meeting agendas which list the technical areas and topics discussed at specific meetings and thereafter would have reviewed the T-doc submissions to meetings with subject matters of interest.

E. 3GPP Technical Specifications

49. In 2007, members of the public, such as POSITAs, would have been aware of 3GPP technical specifications as a definitive source of information regarding the implementation of the UMTS and LTE cellular standards. Members of the public, such as POSITAs, would have also known that each version of a 3GPP technical specification is then published by each of the 3GPP organizational partners (identified above), including ETSI, shortly after approval by 3GPP. In 2007, members of the public, such as POSITAs, would have been independently aware that 3GPP technical specifications for UMTS and LTE were available from 3GPP's website and from each of the 3GPP organization partners, including ETSI.

50. 3GPP specifications are almost always duplicated in at least two and sometimes more locations on the FTP server. The screenshot below shows an excerpt of the "Specs" folder at [ftp.3gpp.org](ftp://ftp.3gpp.org):¹²

¹² [ftp.3gpp.org/Specs](ftp://ftp.3gpp.org/Specs) (Ex. 1057).

Filename	Size	Modified
2016-12	--	14.06.21, 15:53
2017-03	--	14.06.21, 15:52
2017-06	--	23.06.21, 06:54
2017-09	--	23.06.21, 06:54
2017-12	--	23.06.21, 06:53
2018-03	--	09.07.21, 14:00
2018-06	--	26.11.21, 14:34
2018-09	--	30.08.21, 15:48
2018-12	--	13.12.21, 13:36
2019-03	--	18.02.22, 16:23
2019-06	--	30.03.22, 11:02
2019-09	--	30.03.22, 11:03
2019-12	--	30.03.22, 11:05
2020-03	--	09.06.22, 07:20
2020-06	--	07.09.22, 15:20
2020-09	--	21.11.22, 18:02
2020-12	--	21.11.22, 18:03
2021-03	--	01.04.21, 12:38
2021-06	--	30.06.21, 10:58
2021-09	--	30.08.21, 15:49
2021-12	--	25.11.21, 12:52
2022-03	--	19.05.22, 14:04
2022-06	--	17.06.22, 15:37
2022-09	--	14.10.22, 11:58
2022-12	--	29.11.22, 14:31
archive	--	28.03.19, 15:49
html-info	--	22.03.18, 11:55
latest	--	16.06.22, 12:42
latest-drafts	--	Yesterday, 11:47

120 Items

51. In the ordinary course of 3GPP’s regularly conducted business activities, and pursuant to its standard business practices, 3GPP specifications are approved at each plenary meeting and then uploaded to 3GPP’s FTP server and website shortly after the meeting, but typically no later than the month following the date of the meeting. For instance, a specification dated “2018-12” was approved at

the 2018-12 meeting and would have been made available on the 3GPP website shortly after approval.

52. As discussed below, each technical specification is maintained in the “archive” subfolder; the current version of each technical specification is stored in the “latest” folder, until a new version of the technical specification is released; and after every plenary meeting cycle (e.g., every three months), the current set of technical specifications are included in a YEAR-MONTH folder.¹³ For instance, the 2018-12 snapshot folder contains a snapshot of the currently-approved specifications after the December 2018 3GPP plenary meetings.

53. In the ordinary course of 3GPP’s regularly conducted business activities, it is 3GPP’s standard business practice to upload a technical specification to the “latest” and “archive” folders on the 3GPP FTP server shortly after, and at most a few weeks after, a revised version of a technical specification is approved by the plenary group. The “latest” folder thereafter contains only the operative versions of the 3GPP technical specifications, while the “archive” folder contains each version of the technical specification over time. Thus, a POSITA would have accessed either the “latest” or “archive” directory to obtain the operative set of

¹³ These YEAR-MONTH folders remain available for a period of time and are eventually archived and removed from the public FTP server.

specifications or the “archive” directory to understand the development of and changes to the standard over time.

54. While 3GPP’s general business practice is to upload the updated specifications to all three locations at the same time, occasionally there may be a small difference in the upload date, and thus the date stamp, for the same specification uploaded to the three locations.

55. While any member of the public, such as a POSITA, interested in the development or implementation of cellular standards in 2007 would have been aware of the 3GPP specifications and their availability from 3GPP, if such an individual required more information about the location of these materials on the FTP server, the 2007 3GPP homepage shown above (*see* Paragraph 43) included a link to “Specifications”.¹⁴

56. Clicking on the “Specifications” link provided a specifications webpage with various paths for locating specific specifications, such as specification snapshots, *e.g.*, “2007-06”, a link to the “specifications file server area”, or a link to the specifications series page (“To find a particular spec quickly, go here and click

¹⁴ <https://web.archive.org/web/20070707102325/http://www.3gpp.org/> (Ex. 1053).

Declaration of Friedhelm Rodermund

on the links in the spec-series in the table or use the links in the ‘further information’ section.”), as shown below:¹⁵

3GPP Specifications Home Page									
Spec download Titles and spec numbers Current version Releases Numbering scheme Change Requests Published specifications Historical information Work plan TSG Working methods Drafting rules Delegates corner ASN.1									
Quick link to the specifications file server area (http) for those who know where they are going!									
To find a particular spec quickly, go here and click on the links in the spec-series in the table or use the links in the "further information" section.									
<small>The term "3GPP specification" covers all GSM (including GPRS and EDGE) and W-CDMA specifications. The following terms are also used to describe networks using the 3G specifications: UTRAN, UMTS (in Europe) and FOMA (in Japan). Revised versions of many of these specifications are produced up to four times a year following the quarterly TSG plenary meetings. (TSG GERAN meets five times a year.) See the table below which gives links to lists of specifications arising from each plenary TSG meeting since the freezing of Release 1999. The month of the meeting and the meeting number are shown in each case. Note that the tables show only those specifications newly approved or modified at the meeting concerned; they do not contain a complete list of all specifications current following the meeting. For such a list, consult the "status list" - see below.</small>									
<small>Following each TSG SA plenary meeting, a complete set of specifications is produced. This set includes not only the new specifications generated at that meeting, but also the latest versions of each specification that was not changed at that meeting, i.e. each directory holds a complete set of specifications. Each set has an associated status list as detailed in the table below. Each set (and corresponding status list) includes the specs arising from the TSG GERAN meetings held since the preceding SA meeting. (GERAN meets asynchronously from the other TSGs.)</small>									
<small>The Status List (ZIPped RTF or Word format) summarizes the current version number for every release of every 3GPP specification following each TSG plenary meeting. Also listed for each specifications are:</small>									
<ul style="list-style-type: none">the 3GPP working group and rapporteur responsible for the specificationthe Project Manager in MCC (Mobile Competence Centre) responsible for the specificationthe meeting at which it was, or is expected to be, "frozen" (i.e. the point after which only corrections are allowed)									
<small>Full details of the Specifications, their history and current status can be found in the 3GPP Specifications Status database.</small>									
year-month	remark	latest status	specs directory	TSG CN meeting number	TSG RAN* meeting number	TSG T meeting number	TSG SA meeting number	TSG GERAN meeting number	TSG CT meeting number
2007-06		StatusList	ftp://ftp.3gpp.org/specs/2007-06		36		36	34	36
2007-03	GERAN#33 specs have no separate delta directory since meeting was just before other TSGs#35.	StatusList	ftp://ftp.3gpp.org/specs/2007-03		35		35	33	35
2006-12	GERAN#32 specs have no separate delta directory since meeting was just before other TSGs#34.	StatusList	ftp://ftp.3gpp.org/specs/2006-12		34		34	32	34
2006-09	GERAN#31 specs have no separate delta directory since meeting was just before other TSGs#33.	StatusList	ftp://ftp.3gpp.org/specs/2006-09		33		33	31	33
2006-06			ftp://ftp.3gpp.org/specs/2006-06-geran-mtg-30-delta/					30	
2006-06		StatusList	ftp://ftp.3gpp.org/specs/2006-06		32		32		32

57. 3GPP specifications bear a specification number consisting of four or five digits, e.g., 09.02 or 29.002. The first two digits define the specification series, which are defined to group the different aspects of the 3GPP system into, e.g., requirements, service aspects, radio aspects codecs, security aspects, and test specifications. The series digits are followed by two additional digits for the 01 to 13 series or three further digits for the 21 to 55 series.

¹⁵ <https://web.archive.org/web/20070820091849/http://www.3gpp.org:80/specs/specs.htm> (Ex. 1058).

58. If a member of the public was not already aware of the specification number, the 3GPP website in 2007 also included multiple indices identifying the technical subject matter covered by each technical specification.

59. For example, the subjects of the individual specification series for the 3GPP UTMS and LTE standards were explained on 3GPP's website by clicking on the "To find a particular spec quickly, **go here** ..." link on the specifications webpage identified above.¹⁶ This link directed to the 3GPP specification numbering webpage shown below:¹⁷

¹⁶ <https://web.archive.org/web/20070820091849/http://www.3gpp.org:80/specs/specs.htm> (Ex. 1058).

¹⁷ <https://web.archive.org/web/20070810002551/http://www.3gpp.org/specs/numbering.htm> (Ex. 1059).

Declaration of Friedhelm Rodermund

3GPP Specifications - Numbering scheme			
Spec download Titles and spec numbers Current version Releases Numbering scheme Change Requests Published specifications Historical information Work plan TSG Working methods Drafting rules Delegates corner ASN.1			
<p>All 3G and GSM specifications have a 3GPP specification number consisting of 4 or 5 digits. (e.g. 09.02 or 29.002). The first two digits define the series as listed in the table below. They are followed by 2 further digits for the 01 to 13 series or 3 further digits for the 21 to 55 series. The term "3G" means a 3GPP system using a UTRAN radio access network; the term "GSM" means a 3GPP system using a GERAN radio access network. (Thus "GSM" includes GPRS and EDGE features.)</p> <p>The full title, specification number and latest version number for every specification can be found in the current status list [warning: large file!] (see also main specs page for status lists pertaining to each TSG SA meeting) and more information about terms such as R99 and Rel-4 can be found on the Releases and phases page.</p> <p>A specification in the 21 to 35 series may apply either to 3G only or to GSM and 3G. A clue lies in the third digit, where a "0" indicates that it applies to both systems. For example, 29.002 applies to 3G and GSM systems whereas 25.101 and 25.201 apply only to 3G. Most specs in all other series apply only to GSM systems. However, as the spec numbering space has been used up, this guide is frequently broken, and it is necessary to examine the information page for each spec (see the table below) or to check the lists in 01.01 / 41.101 (GSM) and 21.101 (3G) for the definitive specification sets for each system and each Release.</p>			
Subject of specification series	3G/GSM R99 and later	GSM only (Rel-4 and later)	GSM only (before Rel-4)
General information (<i>long defunct</i>)			00 series
Requirements	21 series	41 series	01 series
Service aspects ("stage 1")	22 series	42 series	02 series
Technical realization ("stage 2")	23 series	43 series	03 series
Signalling protocols ("stage 3") - user equipment to network	24 series	44 series	04 series
Radio aspects	25 series	45 series	05 series
CODECs	26 series	46 series	06 series
Data	27 series	47 series (none exists)	07 series
Signalling protocols ("stage 3") - (RSS-CN)	28 series	48 series	08 series
Signalling protocols ("stage 3") - intra-fixed-network	29 series	49 series	09 series
Programme management	30 series	50 series	10 series
Subscriber Identity Module (SIM / USIM), IC Cards. Test specs.	31 series	51 series	11 series
OAM&P and Charging	32 series	52 series	12 series
Access requirements and test specifications		13 series (1)	13 series (1)
Security aspects	33 series	(2)	(2)
UE and (U)SIM test specifications	34 series	(2)	11 series
Security algorithms (3)	35 series	55 series	(4)
Evolved UTRA aspects	36 series	-	-
<p>Note (1): The 13 series GSM specifications relate to European-Union-specific regulatory standards. On the closure of ETSI TC SMG, responsibility for these specifications was transferred to ETSI TC MSG, (Mobile Specification Group) and they do not appear on the 3GPP file server.</p> <p>Note (2): The specifications of these aspects are spread throughout several series.</p> <p>Note (3): Algorithms may be subject to export licensing conditions. See the relevant 3GPP page. See also the relevant ETSI pages.</p>			

60. This webpage describes that the “Radio aspects” of the 3G standards are covered in the “25 series” of specifications.

61. Following a link for a series (e.g., “25 series” link) would have brought the member of the public to a 3GPP web page providing access to all specifications in a series and providing a subject matter index to the list of specifications. For example, the 25 series for the UTRAN radio specification starts at TS 25.053 and ends at TR 25.999, and in the 2007 timeframe included approximately 218 specifications.

Declaration of Friedhelm Rodermund

An excerpt of the list of 25 series specifications in the 2007 timeframe is shown by the screenshot below:¹⁸

3GPP Specification series		
Back to numbering scheme page		
Click on spec number for details		
TS 25.053	Tandem Free Operation (TFO); Service description; Stage 2	SPECIFICATION WITHDRAWN
TS 25.05U	UMTS Radio Aspects; Multiplexing and multiple access	SPECIFICATION WITHDRAWN
TS 25.101	User Equipment (UE) radio transmission and reception (FDD)	•
TS 25.102	User Equipment (UE) radio transmission and reception (TDD)	•
TS 25.103	RF parameters in support of RRM	SPECIFICATION WITHDRAWN
TS 25.104	Base Station (BS) radio transmission and reception (FDD)	•
TS 25.105	Base Station (BS) radio transmission and reception (TDD)	•
TS 25.106	UTRA repeater radio transmission and reception	•
TS 25.107	UTRA Repeater; Conformance testing	SPECIFICATION WITHDRAWN
TS 25.10U	UMTS Radio Aspects; Channel coding	SPECIFICATION WITHDRAWN
TS 25.113	Base station and repeater electromagnetic compatibility (EMC)	•
TS 25.123	Requirements for support of radio resource management (TDD)	•
TS 25.133	Requirements for support of radio resource management (FDD)	•
TS 25.141	Base Station (BS) conformance testing (FDD)	•
TS 25.142	Base Station (BS) conformance testing (TDD)	•
TS 25.143	UTRA repeater conformance testing	•
TS 25.144	User Equipment (UE) and Mobile Station (MS) over the air performance requirements	•
TS 25.15U	UMTS Radio Aspects; Modulation	SPECIFICATION WITHDRAWN
TS 25.171	Requirements for support of Assisted Global Positioning System (A-GPS); Frequency Division Duplex (FDD)	•
TS 25.201	Physical layer - general description	•

62. Alternatively, the specifications series webpage in 2007 included a link “complete list of all 3GPP specification numbers and titles,” which led to a webpage named “3GPP Specification Release version matrix”,¹⁹ as shown below:

¹⁸ <https://web.archive.org/web/20070810232434/http://www.3gpp.org/ftp/Specs/html-info/25-series.htm> (Ex. 1060).

¹⁹ <https://web.archive.org/web/20070905143259/http://www.3gpp.org/ftp/Specs/html-info/SpecReleaseMatrix.htm> (Ex. 1061). A POSITA interested in wireless communications in the 2007 timeframe would have known that Release 7 related to the current 3G release containing the latest technology.

3GPP Specification Release version matrix																	
<p style="text-align: right;">Go to numbering scheme page</p> <p style="text-align: right;">Go to current work plan</p>																	
3GPP Specification Release version matrix																	
<p>This table shows the versions which exist in each Release of the 3GPP specifications.</p> <p>Versions in bold green are current.</p> <p>Versions in italic red are withdrawn.</p> <p>Where no version is shown for a given Release, there is no valid spec for that Release.</p> <p>Phase 1 DCS and Extension Releases are shown separately from Phase 1 proper.</p> <p>The "UMTS" Release indicates specs produced by ETSI TC SMG prior to the creation of 3GPP. (These specs have a "U" suffixed to their number.)</p> <p>The "R00" Release was abandoned in favour of Rel-4 and Rel-5.</p> <p>The 13.-series specifications (which relate to European regulatory requirements) are included in the table for information. On closure of ETSI TC SMG, the active ones were transferred to TC MSG; the version shown in the table reflects that current at the time of the transfer and should NOT be used to indicate the current version.</p> <p>Click on a specification number for detailed information on it.</p>																	
Spec no.	Title	WG	Ph1	Ph1-DCS	Ph1-EXT	UMTS	Ph2	R96	R97	R98	R99	R00	Rel-4	Rel-5	Rel-6	Rel-7	Rel-8
00.01U	Work programme for the standardization of Universal Mobile Telecommunications System (UMTS) <i>spec withdrawn</i>	SMG5				3.2.0											
00.02U	Coordination guideline for SMG on UMTS with respect to ITU and European research programmes <i>spec withdrawn</i>	SMG5				3.0.0											
01.00	Working Procedures for SMG and PT SMG <i>spec withdrawn</i>	SP						5.2.0		7.2.0	8.0.0						
01.01	Technical Specifications and Technical Reports for a GERAN-based 3GPP system	SP	3.1.0				4.0.0	5.0.0	6.0.0	7.0.0	8.18.0						

63. This webpage includes a table of technical specifications, including a specification number ("Spec no."), title ("Title"), working group identification ("WG"), and an indication of which release(s) the specification relates to ("Ph1" through "Rel-7") and provides a further subject matter index of all technical specifications.

64. Information regarding the subject matter of specific technical specifications covering the radio aspects in the 25 series of specifications was further

Declaration of Friedhelm Rodermund

explained by the “Specifications” link on the 2007 RAN WG2 page,²⁰ which led to the RAN WG2 Specifications page describing the subject matter of approximately 36 of the 25 series specifications (and the approximately 47 total specifications) for which RAN WG2 was responsible for, as shown below:²¹

3GPP Specifications per TSG/WG		
		To numbering scheme page
3GPP Specifications for group: R2 (showing rapporteur)		
Click on spec number for details		
TS 25.301	Radio interface protocol architecture	EKEMARK, Sven
TS 25.302	Services provided by the physical layer	ROYER, Cyrille
TS 25.303	Interlayer procedures in Connected Mode	MIKOLA, Juha
TS 25.304	User Equipment (UE) procedures in idle mode and procedures for cell reselection in connected mode	BARRETO, Luis
TS 25.305	User Equipment (UE) positioning in Universal Terrestrial Radio Access Network (UTRAN); Stage 2	BOUE-LAHORGUE, Mathieu
TS 25.306	UE Radio Access capabilities	BERGGREN, Anders
TS 25.307	Requirements on User Equipments (UEs) supporting a release-independent frequency band	BOUE-LAHORGUE, Mathieu
TS 25.308	High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2	KUCHIBHOTLA, Ravi
TS 25.309	FDD enhanced uplink; Overall description; Stage 2	GODARD, Tania
TS 25.319	Enhanced uplink; Overall description; Stage 2	RICHARDS, Derek
TS 25.321	Medium Access Control (MAC) protocol specification	STADLER, Thomas
TS 25.322	Radio Link Control (RLC) protocol specification	HUS, Olivier
TS 25.323	Packet Data Convergence Protocol (PDCP) specification	HANS, Martin
TS 25.324	Broadcast/Multicast Control (BMC)	GOIA, Alessandro
TS 25.331	Radio Resource Control (RRC); Protocol specification	EKEMARK, Sven
TS 25.346	Introduction of the Multimedia Broadcast/Multicast Service (MBMS) in the Radio Access Network (RAN); Stage 2	PIRSKANEN, Juho
TR 25.813	Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Radio interface protocol aspects	SÉBIRE, Benoist
TR 25.815	Signalling enhancements for Circuit-Switched (CS) and Packet-Switched (PS) connections; Analyses and recommendations	PIRSKANEN, Juho
TR 25.819	7.68 Mcps TDD option: Layer 2 and 3 protocol aspects	RICHARDS, Derek
TR 25.834	UTRA TDD low chip rate option; Radio protocol aspects	LIU, YanHui
TR 25.843	1,28 Mcps TDD UE Radio Access Capabilities	ZHU, Yifei
TR 25.844	Radio access bearer support enhancements	KRISHNARAJAH, Ainkaran
TR 25.847	UE positioning enhancements	BECKMANN, Mark
TR 25.859	User Equipment (UE) positioning enhancements for 1,28 Mcps TDD	N, A
TR 25.860	Radio access bearer support enhancements	MIKOLA, Juha
TR 25.862	RAB support for IMS	MIKOLA, Juha
TR 25.894	Enhanced UE positioning using software blanking	BARTLETT, David

²⁰ <https://web.archive.org/web/20070710032216/http://www.3gpp.org/tb/RAN/RAN2/RAN2.htm> (Ex. 1054).

²¹ <https://web.archive.org/web/20070525204220/http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--R2.htm> (Ex. 1062).

65. Thus, a member of the public, such as a POSITA, interested in learning more about particular aspects of a 3GPP standard (e.g., UMTS or LTE) would have been independently aware of the 3GPP website as the definitive source of information regarding the development of the wireless and cellular standards, and once at the website would have consulted the list of technical specifications using the 3GPP webpages (as described above in paragraphs 56-64) to identify a subject matter of interest.

66. A member of the public, such as a POSITA, would have reviewed the instructions on the 3GPP webpages, such as the RAN WG2 specification page, which lists all RAN WG2 specifications including their title and subject matter as shown above. *See* Ex. 1062 at 1. The member of the public would have followed the hyperlink to a webpage to download the relevant specification by navigating to the relevant specification (e.g., “25.321”),²² and finally the relevant version of the specification (e.g., “7.4.0”).²³ These steps would have been straightforward for a member of the public, such as a POSITA.

67. Alternatively, using the webpage a member of the public, such as a POSITA, would have accessed the “latest” subfolder on the FTP server to obtain the

²² <https://web.archive.org/web/20070523112802/http://www.3gpp.org/ftp/Specs/html-info/25321.htm> (Ex. 1063).

²³ https://web.archive.org/web/20070523112802/http://www.3gpp.org/ftp/Specs/archive/25_series/25.321/25321-740.zip (Ex. 1064).

current draft of a specification by navigating to the release folder for the specification (*e.g.*, “Rel-7” folder),²⁴ the specification series folder of interest (*e.g.*, “25_series” folder)²⁵ and then the relevant .zip file containing the version of the specification of interest within that folder (*e.g.*, “25321-750.zip”, where “750” represents version 7.5.0):²⁶

²⁴ <https://web.archive.org/web/20070704003509/http://www.3gpp.org:80/ftp/specs/latest/> (Ex. 1067).

²⁵ <https://web.archive.org/web/20070602105532/http://www.3gpp.org/ftp/Specs/latest/Rel-7/> (Ex. 1065). A POSITA interested in wireless communications in the 2007 timeframe would have known that Release 7 related to the current 3G release containing the latest technology.

²⁶ https://web.archive.org/web/20070907224517/http://www.3gpp.org/ftp/Specs/latest/Rel-7/25_series/ (Ex. 1066 at 1, providing a link to 25321-750.zip). After July 17, 2007, and until a new version of TS 25.321 was approved and uploaded to the 3GPP ftp server, 25.321 V7.5.0 would have been located within the 25321-750.zip in the latest subdirectory).

www.3gpp.org - /ftp/Specs/latest/Rel-7/25_series/

[\[To Parent Directory\]](#)

	12 June 2007	13:18	1421228	25101-780.zip
	12 June 2007	13:18	2477269	25102-770.zip
	12 June 2007	13:18	527020	25104-770.zip
	12 June 2007	13:18	1102978	25105-760.zip
	12 June 2007	13:18	102238	25106-730.zip
	22 March 2007	14:15	66459	25113-760.zip
	12 June 2007	13:18	806510	25123-750.zip
	12 June 2007	13:18	498896	25133-780.zip
	12 June 2007	13:18	840593	25141-780.zip
	12 June 2007	13:18	1298686	25142-760.zip
	12 June 2007	13:18	159555	25143-730.zip
	20 June 2007	12:17	51198	25144-700.zip
	23 June 2006	14:31	126153	25171-710.zip
	14 June 2007	08:51	171174	25201-730.zip
02	October 2006	10:52	122720	25202-710.zip
	14 June 2007	09:13	1078971	25211-720.zip
	14 June 2007	09:37	601318	25212-750.zip
	14 June 2007	10:09	272477	25213-720.zip
	15 June 2007	08:31	740371	25214-750.zip
	14 June 2007	10:27	77497	25215-720.zip
	14 June 2007	14:13	1154334	25221-730.zip
	14 June 2007	14:18	675946	25222-730.zip
	14 June 2007	14:20	395522	25223-740.zip
	14 June 2007	14:22	378743	25224-730.zip
	21 March 2007	16:46	97243	25225-730.zip
	16 July 2007	20:42	625658	25301-720.zip
	16 July 2007	20:30	618964	25302-740.zip
06	April 2006	13:35	467648	25303-700.zip
	17 July 2007	12:17	149016	25304-720.zip
	20 June 2006	21:55	840581	25305-730.zip
	17 July 2007	12:39	142017	25306-740.zip
21	December 2006	14:22	31419	25307-710.zip
	17 July 2007	13:02	570817	25308-730.zip
06	April 2007	21:06	273080	25319-720.zip
	17 July 2007	18:35	965901	25321-750.zip
	24 July 2007	16:11	362215	25322-730.zip
	25 July 2007	08:46	187853	25323-750.zip

F. 3GPP Email Exploders and Archives

68. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, 3GPP maintains archives that include different versions of the specifications, as well as email communications to its membership, including emails announcing the uploading of new or additional documents to 3GPP's FTP server. These archives are created at the time the emails are initially sent.

69. Pursuant to 3GPP's standard business practices, 3GPP working groups generally sent emails notifying members of the public subscribed to the working group's email reflector of the availability of documents as soon as new or additional documents had been uploaded to 3GPP's FTP server. Thus, not only did the general public have access to the documents on the FTP server, but interested members of the public—including those working to develop standards for cellular telecommunication or working to implement the standards—such as POSITAs—were also personally informed of their availability by email. Based on my experience with 3GPP and the telecommunications industry, I would expect any person implementing a cellular network or device, e.g., an UMTS, LTE or 5G network, to consult the corresponding specifications on the 3GPP FTP server, as well as other related documents, and to subscribe to the relevant email reflectors without restriction or expectation of confidentiality. The whole purpose of 3GPP creating and making these specifications available was so that engineers and other individuals interested in the development of cellular technologies would have ready access to them when developing and implementing cellular networks and devices.

70. At least as early as July 1999, all of 3GPP's email archives, including the dedicated email lists for TSG RAN WG2, were freely accessible to the general public with no login, password, or membership requirement and subscription was possible for every interested individual. The screenshot below represents the

subscription page of the 3GPP RAN WG2 email list on list.etsi.org²⁷ demonstrating that this webpage is publicly available and that only an email address and name have to be entered to join the email list. In 2007, the registration webpage looked as follows:²⁸

Subscription Settings

[Subscriber's Corner](#)
[Server Archives](#)
[Help](#)
[Log off](#)

Join or Leave the 3GPP_TSG_RAN_WG2 List

This screen allows you to join or leave the 3GPP_TSG_RAN_WG2 list. To confirm your identity and prevent third parties from subscribing you to a list against your will, an e-mail message with a confirmation code will be sent to the address you specify in the form. Simply wait for this message to arrive, then follow the instructions to confirm the operation.

Alternatively, you can [login with your LISTSERV password](#) (if you have one) and update your subscription interactively, without e-mail confirmation.

Your E-Mail Address:

Your Name:

Subscription Type:

☐ Regular	[NODIGEST]
☐ Digest (traditional)	[NOMIME DIGEST]
☐ Digest (MIME format)	[NOHTML MIME DIGEST]
☐ Digest (HTML format)	[HTML DIGEST]
☐ Index (traditional)	[NOHTML INDEX]
☐ Index (HTML format)	[HTML INDEX]

Mail Header Style:

☐ Normal LISTSERV-style header	[FULLHDR]
☐ LISTSERV-style, with list name in subject	[SUBJECTHDR]
☐ LISTSERV-style, short	[SHORTHDR]
☐ "Dual" (second header in mail body)	[DUALHDR]
☐ sendmail-style	[IETFHDR]

Acknowledgements:

☐ No acknowledgements	[NOACK NOREPRO]
☐ Short message confirming receipt	[ACK NOREPRO]
☐ Receive copy of own postings	[NOACK REPRO]
☐ [Special or obsolete setting]	

Miscellaneous:

☐ Mail delivery disabled temporarily	[NOMAIL]
☐ Address concealed from REVIEW listing	[CONCEAL]

LIST.ETSI.ORG

²⁷ In the past there was also list.3gpp.org which did not represent a dedicated website but instead redirected to list.etsi.org.

²⁸ https://web.archive.org/web/20060105222647/http://list.etsi.org/scripts/wa.exe?SUBED1=3gpp_tsg_ran_wg2&A=1 (Ex. 1068).

Declaration of Friedhelm Rodermund

71. Alternatively, anyone interested can obtain a LISTSERV password for managing subscriptions interactively without email confirmations.

72. Each of 3GPP's member companies typically assigned one or more individuals to regularly participate in these email lists. Thus, not only did the general public have access to the emails in 3GPP's email archives, but some of the most interested members of the public—those working to develop standards for cellular telecommunication—personally received copies of such emails through their participation in the email lists.

73. By June 1999, 3GPP's email archives were well-known to persons in the cellular telecommunications industry as a source of public information and for technical specifications, proposals, meeting announcements, technical discussions and reports regarding industry standards and technological advances.

74. Based on my experience with 3GPP and the telecommunications industry, I would expect a person interested in the development of cellular standards, e.g., UMTS or LTE, to consult the emails archives of the working groups and TSGs that person is interested in, and/or, to be subscribed to the corresponding email reflectors to receive any email notifications in real-time.

75. In many cases, the T-docs are also disseminated on the email exploder of the working group prior to the meeting, making the T-docs available to all those subscribed to the email distribution list.

G. 3GPP Working Group Meetings

76. The actual specification development is performed by the 3GPP working groups (WGs) which meet regularly to progress the work assigned to them by their parent groups, the Technical Specification Groups (TSGs). Pursuant to 3GPP's standard business practices, each WG holds four meetings per year, however, some WGs have additional interim meetings to cover with a high workload. Pursuant to 3GPP's standard business practices, meetings are planned half a year or more ahead and announced e.g. via the email reflectors and the 3GPP website.

77. 3GPP member companies, including the leading companies in the development and implementation of cellular standards, send their delegates to the meetings and big companies typically send several delegates (sometimes more than 10) to the large working groups such as RAN WG1 or WG2. Where a company has sent one or more delegates to a 3GPP meeting, the delegates will frequently share meeting materials with others within their organization. Attendees of 3GPP meetings are free to share materials received at 3GPP meetings without restriction.

78. The WG chairman usually circulates a proposed agenda several weeks ahead of the meeting, and delegates prepare their contributions which they should deliver as T-docs before the deadline set by the WG chairman, which is often one week prior to the meeting. The available T-docs are uploaded to the FTP server

Declaration of Friedhelm Rodermund

before the meeting and are also made available on a local meeting server which is also used during the week to make available revised and new documents.

79. At the end of a meeting each T-doc will have a status value assigned e.g. “agreed”, “noted”, “revised”, or “postponed”. “[A]greed” means the document was accepted and will be presented to the TSG for final approval. “[N]oted” means the document was presented without any resulting specific action. “[R]evised” means a modified version of the document with a new T-doc number will be created addressing comments and feedback from the WG. “[P]ostponed” means the document was presented and no final decision could be reached, or, the document was not presented due to lack of time. There are several more T-doc status values defined and described in the 3GPP Working Methods, TR 21.900.²⁹

80. Most delegates prepare for the meeting also by reading other delegates documents. For this purpose, the whole meeting folder may be downloaded from the FTP server at once. The week after the meeting at the latest, the meeting folder of the public FTP server is updated with the documents (revisions and new documents) created during the meeting, and quite often an early draft meeting report, if distributed at the end of a meeting, is also uploaded, followed by a cleaned-up draft the week after the meeting.

²⁹ Available from <https://www.3gpp.org/delegates-corner/3gpp-working-procedures> and from the 3GPP ftp server.

V. PUBLIC AVAILABILITY OF SPECIFIC DOCUMENTS

81. As explained above, 3GPP employs a set of documented business practices to make documents and information available to 3GPP delegates and interested members of the public, such as POSITAs. Below I address the availability of R2-073254, TS 25.321 V7.5.0, and TS 25.331 V7.5.0 based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices.

A. T-doc R2-073254 (Ex. 1008)

1. Authentication

82. Ex. 1008 is a true and correct copy of 3GPP T-doc R2-073254, titled "Further discussion on enhanced CELL_FACH in REL8," except that each page includes an exhibit label and page numbers on the bottom right corner added by counsel. I obtained Ex. 1008 from 3GPP's FTP server at the following location: https://www.3gpp.org/FTP/tsg_ran/WG2_RL2/TSGR2_59/Docs. Ex. 1069. The authenticity of Ex. 1008 (R2-073254) is further confirmed by the identical "R2-073254.zip" file attached to Mr. Wimmer's email³⁰ sent via the 3GPP_TSG_RAN_WG2 email reflector, which is identical to and has the same last modified date as Ex. 1008 (R2-073254). *See* paragraph 87 below.

³⁰ https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_RAN_WG2;3cceb99d.0708&S= (Ex. 1070).

2. Distribution Via 3GPP TSG RAN WG2 Reflector

83. R2-073254 was distributed to subscribers of the 3GPP_TSG_RAN_WG2 email reflector on August 14, 2007 in an email from Mr. Markus Wimmer of Nokia Solutions and Networks, which states that three contributions are attached, including “R2-073254: Further discussion on enhanced CELL_FACH in REL8.”³¹ The “R2-073254.zip” file attached to Mr. Wimmer’s email³² is identical to and has the same last modified date as Ex. 1008 (R2-073254). When Mr. Wimmer sent the 3GPP_TSG_RAN_WG2 email, the email reflector had at least 900 subscribers.³³ Therefore, those at least 900 subscribers to the email reflector would have received a copy of R2-073254 on August 14, 2007. 3GPP

³¹ https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_RAN_WG2;3cceb99d.0708&S= (Ex. 1070).

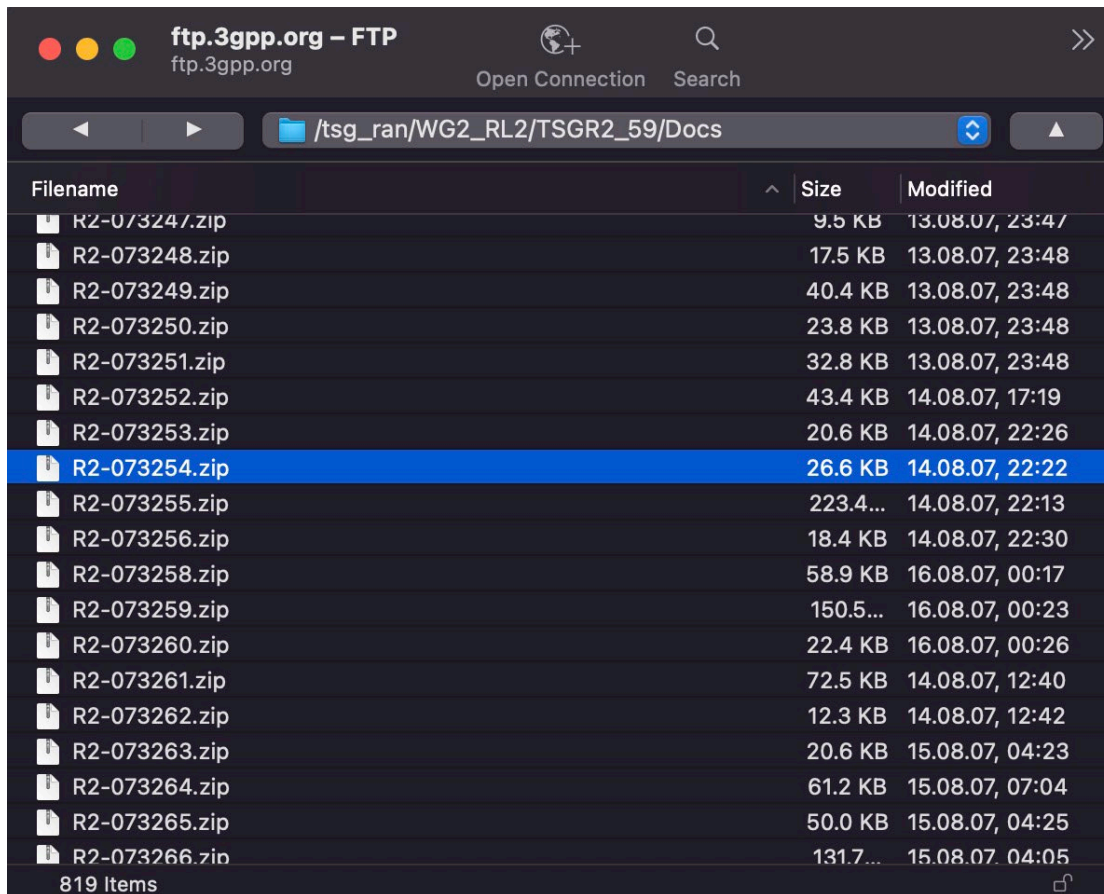
³² https://list.etsi.org/scripts/wa.exe?A3=ind0708&L=3GPP_TSG_RAN_WG2&E=base64&P=7845927&B=-----%3D_NextPart_001_01C7DE81.00F02165&T=application%2Fzip-compressed;%20name=%22R2-073254.zip%22&N=R2-073254.zip&attachment=q&XSS=3 (“R2-073254 Enhanced RACH.doc” Ex. 1071).

³³ Compare <https://web.archive.org/web/20070714151920/http://list.etsi.org:80/> (913 subscribers on July 14, 2007) (Ex. 1072), with <https://web.archive.org/web/20070816051307/http://list.etsi.org/> (980 subscribers on August 16, 2007) (Ex. 1073). Experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the number of subscribers listed on the list.etsi.org webpage, as archived by the Internet Archive, as a reliable indicator of the number of individuals to which an email was disseminated.

placed no restriction on how recipients were permitted to share R2-073254 with others after receiving it.

3. Available On 3GPP Public FTP Server

84. Ex. 1008 (R2-073254) was uploaded to the 3GPP FTP server on August 14, 2007, based on the upload date stamp on the 3GPP FTP server, as shown in the screenshot below:³⁴



Filename	Size	Modified
R2-073247.zip	9.5 KB	13.08.07, 23:47
R2-073248.zip	17.5 KB	13.08.07, 23:48
R2-073249.zip	40.4 KB	13.08.07, 23:48
R2-073250.zip	23.8 KB	13.08.07, 23:48
R2-073251.zip	32.8 KB	13.08.07, 23:48
R2-073252.zip	43.4 KB	14.08.07, 17:19
R2-073253.zip	20.6 KB	14.08.07, 22:26
R2-073254.zip	26.6 KB	14.08.07, 22:22
R2-073255.zip	223.4...	14.08.07, 22:13
R2-073256.zip	18.4 KB	14.08.07, 22:30
R2-073258.zip	58.9 KB	16.08.07, 00:17
R2-073259.zip	150.5...	16.08.07, 00:23
R2-073260.zip	22.4 KB	16.08.07, 00:26
R2-073261.zip	72.5 KB	14.08.07, 12:40
R2-073262.zip	12.3 KB	14.08.07, 12:42
R2-073263.zip	20.6 KB	15.08.07, 04:23
R2-073264.zip	61.2 KB	15.08.07, 07:04
R2-073265.zip	50.0 KB	15.08.07, 04:25
R2-073266.zip	131.7...	15.08.07, 04:05

819 Items

³⁴ https://www.3gpp.org/FTP/tsg_ran/WG2_RL2/TSGR2_59/Docs (Ex. 1069).

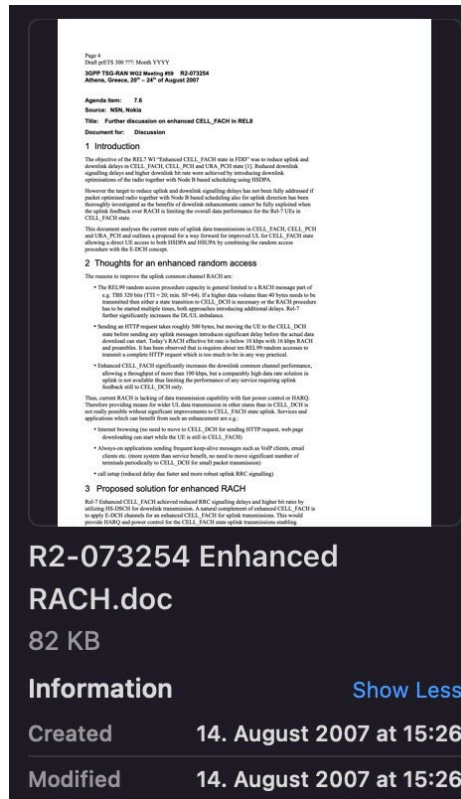
85. This August 14, 2007 date is confirmed by the Internet Archive's July 19, 2008 capture of the 3GPP FTP server for the corresponding downloadable file ("R2-073254.zip").³⁵

86. Experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the FTP server upload date on the 3GPP FTP server as the date the document became available to the public and would consider the archived version of the directory structure maintained by the Internet Archive as further confirmation of the date of public availability.

87. In addition, metadata information for the downloaded and extracted T-doc file states a last Modified date of "14. August 2007,"³⁶ as shown in the screenshot below:

³⁵ https://web.archive.org/web/20080719190403/http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Docs/ (Ex. 1074).

³⁶ Ex. 1008; *see also* https://web.archive.org/web/20080719190403/http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Docs/R2-073254.zip (Ex. 1075).



This last modified date is consistent with the August 14, 2007 upload date of the document and the standard business practice among 3GPP participants to upload submissions shortly after completing them.

88. As explained in Section IV, members of the public, such as a POSITA, would have been able to locate R2-073254 by identifying the RAN WG2 as the responsible 3GPP working group for radio layers 2 and 3, followed by reviewing one or several meeting reports. The draft meeting report for RAN WG2 Meeting No. 59 was uploaded to the 3GPP FTP server on August 28, 2007.³⁷ The draft meeting report on page 77 and on page 91 shows T-doc R2-073254 including the T-doc

³⁷ https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Minutes (Ex. 1077).

number and the title “discussion on enhanced CELL-FACH in Rel-8,” which describes the subject matter of R2-073254:³⁸

R2-073254	discussion on enhanced CELL_FACH in Rel-8	Nokia, Nokia Siemens Networks Nokia, Nokia Siemens	Mr. Luis Barreto	07.6: Release 8
-----------	---	---	------------------	-----------------

89. Therefore, no later than August 28, 2007, members of the public, such as a POSITA, would have had access to a subject matter index of submissions to RAN WG2 Meeting No. 59, including R2-073254.

90. A member of the public who was reviewing the meeting minutes would not have encountered any difficulty locating R2-073254 on the FTP server in the “Docs” folder for RAN WG2 Meeting No. 59 by using the R2-073254 T-doc number.³⁹

91. At least after August 28, 2007, members of the public interested in cellular communications and the development of wireless communication standards, including POSITAs, would have been aware of 3GPP’s standard business practices for the organization of documents on the FTP server, including the location of materials for the RAN WG2 (or would have learned of 3GPP’s standard business practices, the responsibilities of RAN WG2, and the location of RAN WG2’s materials on the FTP server (*see* Sections IV)) and would have been able to locate

³⁸ https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Minutes/Draft0_Minutes_RAN2-59.zip (Ex. 1076 at 77, 91).

³⁹ https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Docs/ (Ex. 1069).

R2-073254 after exercising reasonable diligence, including using the T-doc titles in the meeting minutes or the document index as a subject matter index to locate R2-073254.

4. Distribution at RAN WG2 Meeting No. 59

92. R2-073254 was submitted to the RAN WG2 Meeting No. 59 held on August 20-24, 2007, in Athens, Greece. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, R2-073254 would have been made available to all attending 3GPP members in electronic form no later than August 24, 2007, which was the last day of the Athens meeting. 3GPP places no restrictions on documents made available at meetings, and attendees were free to share R2-073254 without restriction or obligation of confidentiality.

93. The final meeting report of the RAN WG2 Meeting No. 59 meeting held August 20-24, 2007, in Athens, Greece shows that the meeting was attended by 183 individuals.⁴⁰ The draft meeting report on page 77 and page 91 identifies T-doc R2-073254, which clearly shows that the document was a registered T-doc for this meeting:⁴¹

R2-073254	discussion on enhanced CELL_FACH in Rel-8	Nokia, Nokia Siemens Networks Nokia, Nokia Siemens	Mr. Luis Barreto	07.6: Release 8
-----------	---	---	------------------	-----------------

⁴⁰ https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Minutes/R2-074444.zip (“3GPPRAN2_59.xls” Ex. 1078).

⁴¹ https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Minutes/Draft0_Minutes_RAN2-59.zip (Ex. 1076 at 77, 91).

94. Similarly, the final meeting report on pages 78 and 93 also identifies T-doc R2-073254, which further confirms that the document was a registered T-doc for this meeting.⁴²

95. R2-073254 was therefore made available to all 183 attendees of RAN WG2 #59, including POSITAs, by no later than August 24, 2007, and meeting participants would have learned of the document's existence during the meeting.

5. Conclusion

96. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, Ex. 1008 is an authentic copy of 3GPP T-doc R2-073254 that was disseminated on August 13, 2007 via email to at least 900 interested members of the public subscribed to the 3GPP_TSG_RAN_WG2 email reflector, including delegates of the 3GPP member companies; uploaded and made available via the 3GPP FTP server to the general public where interested members of the public, such as POSITAs, would have been able to locate the reference exercising reasonable diligence by August 24, 2007; and made available to at least 183 attendees of the RAN WG2 #59 meeting, by no later than August 24, 2007.

⁴² https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Minutes/R2-074444.zip ("Draft3_Minutes_RAN2-59.doc" Ex. 1079 at 78, 93).

B. TS 25.321 V7.5.0 (Ex. 1009)

1. Authentication

97. Ex. 1009 (TS 25.321 V7.5.0) is a true and correct copy of 3GPP TS 25.321 V7.5.0, titled “Technical Specification Group Radio Access Network; Medium Access Control (MAC) protocol specification (Release 7),” except that each page includes an exhibit label and page numbers on the bottom right corner added by counsel. I obtained Ex. 1009 (TS 25.321 V7.5.0) from 3GPP’s FTP server at the following location:

https://www.3gpp.org/FTP/Specs/archive/25_series/25.321. Ex. 1080.

98. A substantively identical copy of Ex. 1009 (TS 25.321 V7.5.0), with the only differences appearing on the cover page and the added history page on the last page of the ETSI version, which identifies the document revision history, was published by ETSI.⁴³

2. Publication by 3GPP and ETSI

99. Ex. 1009 (TS 25.321 V7.5.0) shows on its cover page “2007-06” as the year (2007) and month (June) during which the document was released by 3GPP. This is aligned with the “Change history” on the document’s last page which shows

⁴³ https://www.etsi.org/deliver/etsi_ts/125300_125399/125321/07.05.00_60/ (July 23, 2007 upload date) (Ex. 1081); https://www.etsi.org/deliver/etsi_ts/125300_125399/125321/07.05.00_60/ts_125321v070500p.pdf (Ex. 1082).

“06/2007” as the last “Date” entry, where the first set of digits (“06”) is the month, and the third set of digits (“2007”) is the year.

100. This publication date is further confirmed by the publication history of TS 25.321 V7.5.0 in the ETSI copy of TS 25.321, named ETSI TS 125 321, which states that V7.5.0 was published in June 2007.⁴⁴ The publication of the corresponding ETSI TS at most a few weeks after the publication of the original 3GPP TS is consistent with ETSI’s standard business practices.

101. In 2007, members of the public, such as POSITAs, including anyone with an interest in the development or implementation of cellular standards, would have been aware of 3GPP and ETSI as the publishers of 3GPP technical specifications. These members of the public would have also been aware of the subject matter covered by TS 25.321 and where to locate TS 25.321 on the 3GPP or ETSI websites. Alternatively, a member of the public would have learned about the subject matter of TS 25.321 using the 3GPP website as a resource (*see* Section IV) as well as the location of TS 25.321 on the 3GPP and ETSI websites. Thereafter, a member of the public and would have encountered no difficulty obtaining a copy from either 3GPP or ETSI.

⁴⁴ https://www.etsi.org/deliver/etsi_ts/125300_125399/125321/07.05.00_60/ (July 23, 2007 upload date) (Ex. 1081); https://www.etsi.org/deliver/etsi_ts/125300_125399/125321/07.05.00_60/ts_125321v070500p.pdf (Ex. 1082).

102. Moreover, because 3GPP and ETSI are well-known and respected publishers of technical specifications, experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the publication dates printed on the technical specifications published by 3GPP and ETSI for the date when the technical specification became available to members of the public. Based on this publication data and 3GPP's standard business practice to make 3GPP technical specifications available to the public shortly after they are approved at the Technical Specification Group meeting, TS 25.321 V7.5.0 was approved for publication in June 2007 and published and made available to members of the public by 3GPP no later than July 17, 2007⁴⁵ and by ETSI by no later than July 23, 2007.⁴⁶

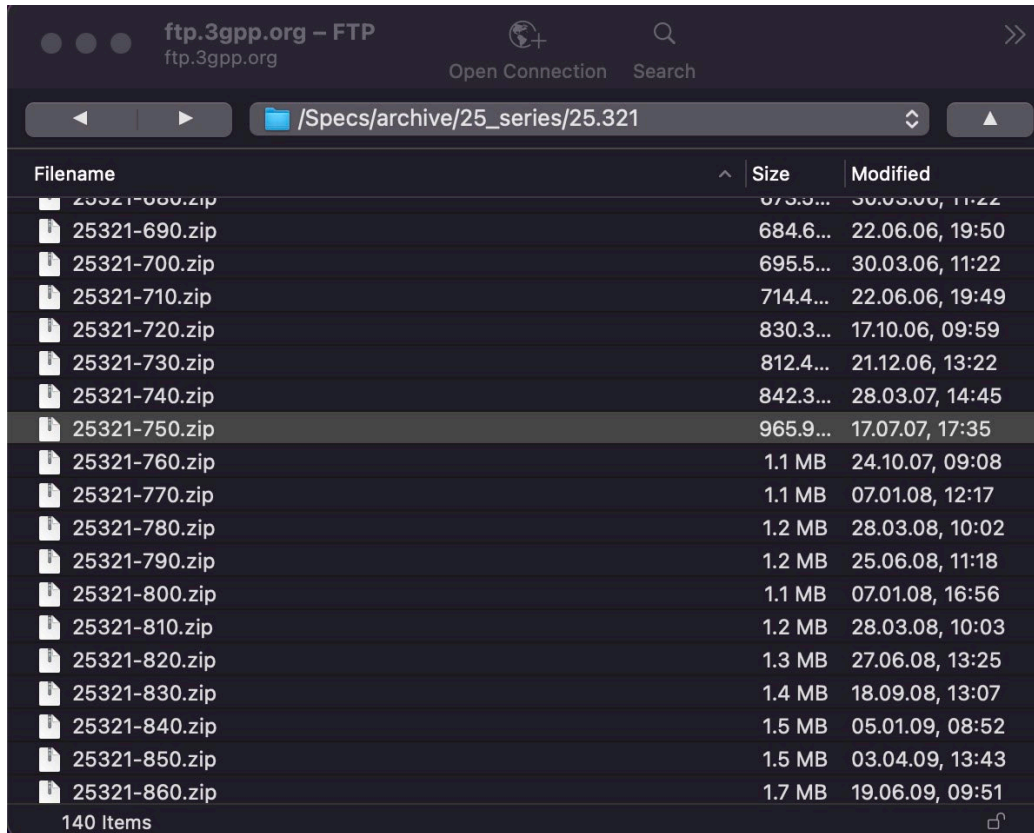
3. Available On 3GPP Public FTP Server and 3GPP Website

103. Ex. 1009 (TS 25.321 V7.5.0) was uploaded to the 3GPP FTP server on July 17, 2007, based on the upload date stamp shown in the "archive" folder on the 3GPP FTP server, as shown in the screenshot below for the corresponding downloadable file ("25321-750.zip")⁴⁷:

⁴⁵ https://www.3gpp.org/ftp/Specs/archive/25_series/25.321 (Ex. 1080).

⁴⁶ https://web.archive.org/web/20131115195236/http://webapp.etsi.org/key/key.asp?full_list=y (Ex. 1083).

⁴⁷ https://www.3gpp.org/ftp/Specs/archive/25_series/25.321 (Ex. 1080).



The screenshot shows an FTP client window titled 'ftp.3gpp.org - FTP'. The address bar displays the path '/Specs/archive/25_series/25.321'. Below the address bar is a table listing files with columns for 'Filename', 'Size', and 'Modified'. The file '25321-750.zip' is highlighted. At the bottom, it says '140 Items'.

Filename	Size	Modified
25321-680.zip	673.3...	30.03.06, 11:22
25321-690.zip	684.6...	22.06.06, 19:50
25321-700.zip	695.5...	30.03.06, 11:22
25321-710.zip	714.4...	22.06.06, 19:49
25321-720.zip	830.3...	17.10.06, 09:59
25321-730.zip	812.4...	21.12.06, 13:22
25321-740.zip	842.3...	28.03.07, 14:45
25321-750.zip	965.9...	17.07.07, 17:35
25321-760.zip	1.1 MB	24.10.07, 09:08
25321-770.zip	1.1 MB	07.01.08, 12:17
25321-780.zip	1.2 MB	28.03.08, 10:02
25321-790.zip	1.2 MB	25.06.08, 11:18
25321-800.zip	1.1 MB	07.01.08, 16:56
25321-810.zip	1.2 MB	28.03.08, 10:03
25321-820.zip	1.3 MB	27.06.08, 13:25
25321-830.zip	1.4 MB	18.09.08, 13:07
25321-840.zip	1.5 MB	05.01.09, 08:52
25321-850.zip	1.5 MB	03.04.09, 13:43
25321-860.zip	1.7 MB	19.06.09, 09:51

104. This July 17, 2007 date is confirmed by the Internet Archive’s August 14, 2007 capture of the 3GPP “archive” directory on the FTP server for the corresponding downloadable file (“25321-750.zip”).⁴⁸

105. This July 17, 2007 date is further confirmed by the Internet Archive’s September 7, 2007 capture of the 3GPP “latest” directory on the FTP server for the corresponding downloadable file (“25321-750.zip”).⁴⁹

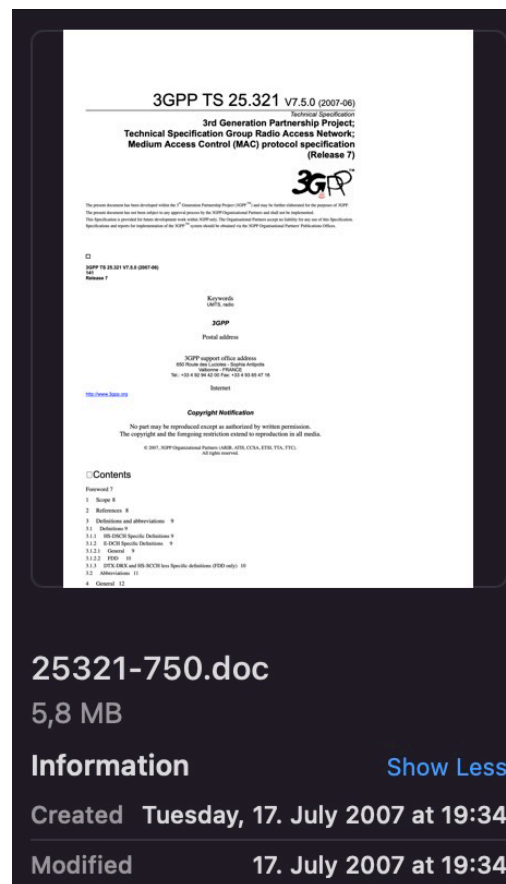
⁴⁸ https://web.archive.org/web/20070814155639/http://www.3gpp.org/ftp/Specs/archive/25_series/25.321/ (Ex. 1084).

⁴⁹ https://web.archive.org/web/20070907224517/http://www.3gpp.org/ftp/Specs/latest/Rel-7/25_series/ (Ex. 1066).

Declaration of Friedhelm Rodermund

106. Experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the FTP server upload dates on the 3GPP FTP server as the date the document became available to the public and would consider the archived version of the directory structure maintained by the Internet Archive as further confirmation of the date of public availability.

107. In addition, metadata information for the downloaded and extracted specification file states a last Modified date of “17. July 2007,”⁵⁰ as shown in the screenshot below:



This last modified date is consistent with the July 17, 2007 upload date of the document and 3GPP's standard business practice to upload technical specifications shortly after approval.

108. To the extent a member of the public was not already independently aware of TS 25.321, a member of the public would have been able to locate TS 25.321 V7.5.0 in a number of ways. As one example, and as explained in greater detail in Section IV, in 2007 a member of the public, such as a POSITA, would have identified the RAN WG2 as the responsible 3GPP working group for radio layers 2 and 3 and would have then reviewed a subject matter index of approximately 47 specifications for which RAN WG2 was responsible for.⁵¹ For example, the RAN WG2 specifications page provided a subject matter description of TS 25.321 as concerning "Medium Access Control (MAC) protocol specification." *Id.*

109. As a further example, and as explained in greater detail in Section IV, in 2007 a member of the public, such as a POSITA, would have considered the specification series page,⁵² which identified the 25 series as related to "Radio aspects," another subject matter descriptor for the content of 25.321, and would have been able to review the list of approximately 218 specifications within the 25 series

⁵¹ <https://web.archive.org/web/20070525204220/http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--R2.htm> (Ex. 1062).

⁵² <https://web.archive.org/web/20070810002551/http://www.3gpp.org/specs/numbering.htm> (Ex. 1059).

on the FTP server.⁵³ Alternatively, the member of the public would have been able to use the “25 series” list of technical specifications as a further subject matter index of approximately 218 technical specifications within the 25 series, to identify TS 25.321 as concerning “Medium Access Control (MAC) protocol specification.”⁵⁴

110. As a further example, and as explained in greater detail in Section IV, a member of the public, such as a POSITA, would have accessed the full index of specifications on 3GPP’s website⁵⁵ or the “3GPP Specification Release version matrix.”⁵⁶ The entry for 25.321 in the full index of 3GPP specifications included a title of “Medium Access Control (MAC) protocol specification,” which serves as a subject matter descriptor for the content of TS 25.321, indicates that “R2,” which is “RAN WG2,” is the responsible working group, that the specification relates to releases R99, Rel-4, Rel-5, Rel-6, and Rel-7 and is an active specification.⁵⁷

111. The above examples illustrate that in 2007 it was straightforward for an interested member of the public without prior knowledge of the TS number to

⁵³ <https://web.archive.org/web/20070810232434/http://www.3gpp.org/ftp/Specs/html-info/25-series.htm> (Ex. 1060).

⁵⁴ <https://web.archive.org/web/20070810232434/http://www.3gpp.org/ftp/Specs/html-info/25-series.htm> (Ex. 1060).

⁵⁵ <https://web.archive.org/web/20071101043800/http://www.3gpp.org/specs/3GPP-Spec-Titles.zip> (Ex. 1087 at 24).

⁵⁶ <https://web.archive.org/web/20071112134824/http://www.3gpp.org/ftp/Specs/html-info/SpecReleaseMatrix.htm> (Ex. 1088).

⁵⁷ <https://web.archive.org/web/20071101043800/http://www.3gpp.org/specs/3GPP-Spec-Titles.zip> (Ex. 1087 at 24).

discover that TS 25.321 related to radio aspects of the 3G standard, specifically the medium access control (MAC) protocol.

112. Once the member of the public was aware of the 25.321 specification number, the member of the public, such as a POSITA, to the extent she was not already aware of the location of the technical specification on the 3GPP FTP server, would have then followed the instructions on the 3GPP webpages, as described in Section IV, to download the specification. For example, a member of the public would have reviewed the “3GPP Specifications – Numbering scheme” webpage link and been informed that “The latest versions of the approved specifications in the ‘latest’ directory” (<http://www.3gpp.org/FTP/Specs/latest/>) or that “[a]ll older versions of specifications (where available) are stored in the archive subdirectory. All versions of all releases of a given specification are placed directly under the name of the specification” (<http://www.3gpp.org/FTP/specs/archive/>).⁵⁸

113. As discussed above, TS 25.321 V7.5.0 was uploaded to the 3GPP FTP server on July 17, 2007 and was thereafter available for download from both the “archive” and “latest” directories on the 3GPP FTP server.

114. As discussed in Section IV, a member of the public, such as a POSITA, would have reviewed the instructions on the 3GPP webpages, such as the RAN WG2

⁵⁸ <https://web.archive.org/web/20070810002551/http://www.3gpp.org/specs/numbering.htm> (Ex. 1059).

specification page (*see* Ex. 1062 at 1) which lists all RAN WG2 specifications including their title and subject matter as shown above, and would have followed the hyperlink to a webpage to download the relevant TS 25.321 specification,⁵⁹ and then navigated to the relevant version (e.g., “7.5.0”). Alternately, after determining the desired specification, the 3GPP specifications webpage directed users to access the document from the 3GPP FTP server by following the “Quick link to the specifications file server area (http),”⁶⁰ which would have brought the user to the “Specs” directory, which included links to both the “archive” and “latest” subfolders.⁶¹ From the “archive” directory of the 3GPP FTP server, the member of the public would have navigated to the relevant series (e.g., “25_series”),⁶² relevant specification (e.g., “25.321”),⁶³ and finally the relevant version of the specification (e.g., “7.5.0”).⁶⁴ These steps would have been straightforward for a member of the public, such as a POSITA.

⁵⁹ <https://web.archive.org/web/20070827053924/http://www.3gpp.org:80/ftp/Specs/html-info/25321.htm> (Ex. 1085).

⁶⁰ <https://web.archive.org/web/20070820091849/http://www.3gpp.org:80/specs/specs.htm> (Ex. 1058).

⁶¹ <https://web.archive.org/web/20070818015343/http://www.3gpp.org/ftp/Specs/> (Ex. 1097).

⁶² <https://web.archive.org/web/20070815092224/http://www.3gpp.org/ftp/Specs/archive/> (Ex. 1089)

⁶³ https://web.archive.org/web/20070815120847/http://www.3gpp.org/ftp/Specs/archive/25_series/ (Ex. 1098).

⁶⁴ https://web.archive.org/web/20070814155639/http://www.3gpp.org/ftp/Specs/archive/25_series/25.321/ (Ex. 1084).

115. Alternatively, a member of the public, such as a POSITA, would have accessed the “latest” subfolder⁶⁵ on the FTP server to obtain the current draft of a specification by navigating to the release folder for the specification (*e.g.*, “Rel-7” folder),⁶⁶ the specification series folder of interest (*e.g.*, “25_series” folder),⁶⁷ and then the relevant .zip file containing the version of the specification of interest within that folder (*e.g.*, “25321-750.zip”, where “750” represents version 7.5.0).⁶⁸

116. Thus, in 2007, members of the public interested in cellular communications and the development of wireless communication standards, including POSITAs, would have been aware of 3GPP’s standard business practices for the organization of documents on the FTP server, including the location of the technical specifications, and would have been able to locate TS 25.321 V7.5.0 without difficulty. To the extent the member of the public required additional information regarding the specific subject matter of particular specifications, the

⁶⁵ <https://web.archive.org/web/20070818015343/http://www.3gpp.org/ftp/Specs/> (Ex. 1097).

⁶⁶ <https://web.archive.org/web/20070901000715/http://www.3gpp.org/ftp/Specs/latest/> (Ex. 1099).

⁶⁷ <https://web.archive.org/web/20070901000642/http://www.3gpp.org/ftp/Specs/latest/Rel-7/> (Ex. 1100). A POSITA interested in wireless communications in the 2007 timeframe would have known that Release 7 related to the current 3G release containing the latest technology.

⁶⁸ https://web.archive.org/web/20070907224517/http://www.3gpp.org/ftp/Specs/latest/Rel-7/25_series/ (Ex. 1066). After July 17, 2007, and until a new version of TS 25.321 was approved and uploaded to the 3GPP ftp server, 25.321 V7.5.0 would have been located within the 25321-750.zip in the latest subdirectory.

3GPP website included multiple subject matter indices of specification series and individual specifications.

4. Conclusion

117. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, Ex. 1009 is an authentic copy of TS 25.321 V7.5.0 that was published by 3GPP by no later than July 17, 2007; published by ETSI no later than July 23, 2007; and was uploaded and made available via the 3GPP FTP server to the general public where interested members of the public, such as POSITAs, would have been able to locate the reference exercising reasonable diligence by July 17, 2007.

C. TS 25.331 V7.5.0 (Ex. 1011)

1. Authentication

118. Ex. 1011 (TS 25.331 V7.5.0) is a true and correct copy of 3GPP TS 25.331 V7.5.0, titled "Technical Specification Group Radio Access Network; Radio Resource Control (RRC); Protocol specification (Release 7)," except that counsel enlarged the object boxes on the first and second page of the exhibit in order to print the exhibit correctly, and each page includes an exhibit label and page numbers on the bottom right corner added by counsel. Ex. 1011 (modified first and second pages); Ex. 1095 (unmodified). I obtained Ex. 1011 (TS 25.331 V7.5.0) from

3GPP's FTP server at the following location:

https://www.3gpp.org/FTP/Specs/archive/25_series/25.331. Ex. 1092.

119. A substantively identical copy of Ex. 1011 (TS 25.331 V7.5.0), with the only differences appearing on the cover page and the added history page on the last page of the ETSI version, which identifies the document revision history, was published by ETSI.⁶⁹

2. Publication by 3GPP and ETSI

120. Ex. 1011 (TS 25.331 V7.5.0) shows on its cover page “2007-06” as the year (2007) and month (June) during which the document was released by 3GPP. This is aligned with the “Change history” on the document’s last page which shows “06/2007” as the last “Date” entry, where the first set of digits (“06”) is the month, and the third set of digits (“2007”) is the year.

121. This publication date is further confirmed by the publication history of TS 25.331 V7.5.0 in the ETSI copy of TS 25.331, named ETSI TS 125 331, which states that V7.5.0 was published in June 2007.⁷⁰ The publication of the

⁶⁹ https://www.etsi.org/deliver/etsi_ts/125300_125399/125331/07.05.00_60/ (August 14, 2007 upload date) (Ex. 1090);
https://www.etsi.org/deliver/etsi_ts/125300_125399/125331/07.05.00_60/ts_125331v070500p.pdf (Ex. 1091).

⁷⁰ https://www.etsi.org/deliver/etsi_ts/125300_125399/125331/07.05.00_60/ (August 14, 2007 upload date) (Ex. 1090);
https://www.etsi.org/deliver/etsi_ts/125300_125399/125331/07.05.00_60/ts_125331v070500p.pdf (Ex. 1091).

corresponding ETSI TS at most a few weeks after the publication of the original 3GPP TS is consistent with ETSI's standard business practices.

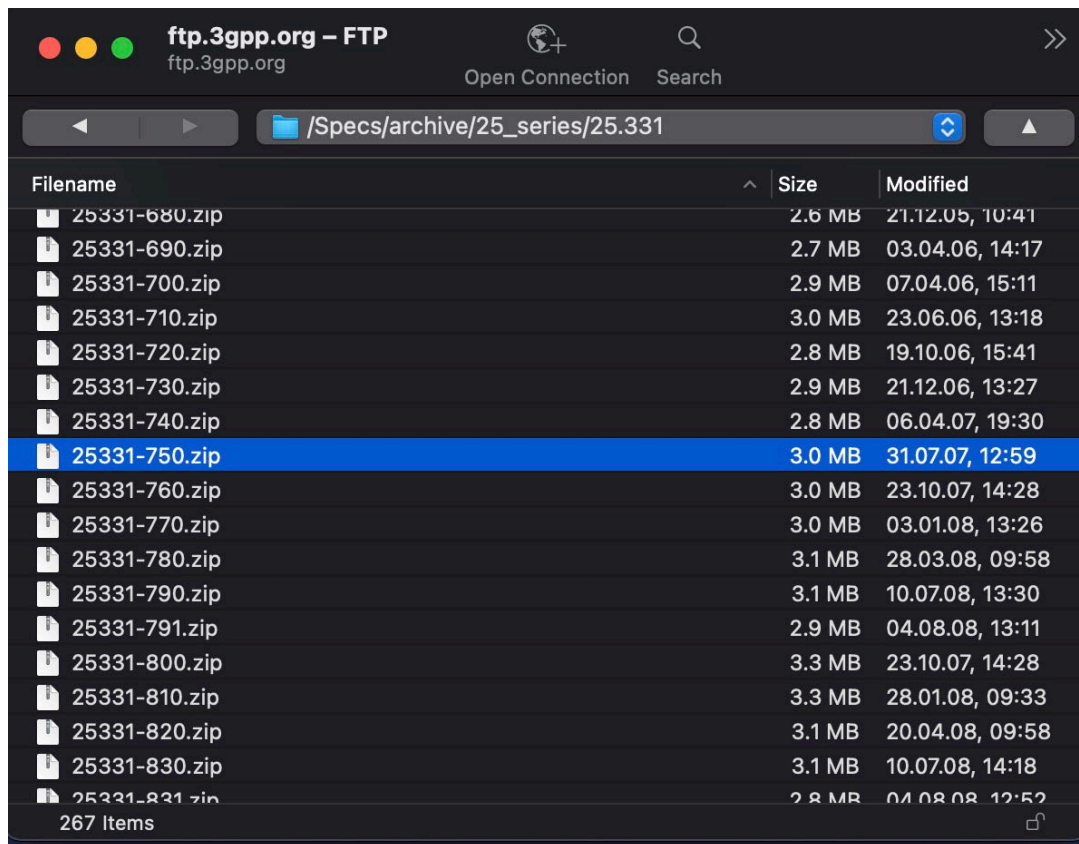
122. In 2007, members of the public, such as POSITAs, including anyone with an interest in the development or implementation of cellular standards, would have been aware of 3GPP and ETSI as the publishers of 3GPP technical specifications. These members of the public would have also been aware of the subject matter covered by TS 25.331 and where to locate TS 25.331 on the 3GPP or ETSI websites. Alternatively, a member of the public would have learned about the subject matter of TS 25.331 using the 3GPP website as a resource (*see* Section IV) as well as the location of TS 25.321 on the 3GPP and ETSI websites. Thereafter, a member of the public and would have encountered no difficulty obtaining a copy from either 3GPP or ETSI.

123. Moreover, because 3GPP and ETSI are well-known and respected publishers of technical specifications, experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the publication dates printed on the technical specifications published by 3GPP and ETSI for the date when the technical specification became available to members of the public. Based on this publication data and 3GPP's standard business practice to make 3GPP technical specifications available to the public shortly after they are approved at the Technical Specification Group meeting, TS 25.331 V7.5.0 was approved for

publication in June 2007 and published and made available to members of the public by 3GPP no later than July 31, 2007⁷¹ and ETSI by no later than August 14, 2007.⁷²

3. Available On 3GPP Public FTP Server and 3GPP Website

124. Ex. 1011 (TS 25.331 V7.5.0) was uploaded to the 3GPP FTP server on July 31, 2007, based on the upload date stamp shown in the “archive” folder on the 3GPP FTP server, as shown in the screenshot below for the corresponding downloadable file (“25331-750.zip”):⁷³



Filename	Size	Modified
25331-680.zip	2.6 MB	21.12.05, 10:41
25331-690.zip	2.7 MB	03.04.06, 14:17
25331-700.zip	2.9 MB	07.04.06, 15:11
25331-710.zip	3.0 MB	23.06.06, 13:18
25331-720.zip	2.8 MB	19.10.06, 15:41
25331-730.zip	2.9 MB	21.12.06, 13:27
25331-740.zip	2.8 MB	06.04.07, 19:30
25331-750.zip	3.0 MB	31.07.07, 12:59
25331-760.zip	3.0 MB	23.10.07, 14:28
25331-770.zip	3.0 MB	03.01.08, 13:26
25331-780.zip	3.1 MB	28.03.08, 09:58
25331-790.zip	3.1 MB	10.07.08, 13:30
25331-791.zip	2.9 MB	04.08.08, 13:11
25331-800.zip	3.3 MB	23.10.07, 14:28
25331-810.zip	3.3 MB	28.01.08, 09:33
25331-820.zip	3.1 MB	20.04.08, 09:58
25331-830.zip	3.1 MB	10.07.08, 14:18
25331-831.zip	2.8 MB	04.08.08, 12:52

267 Items

⁷¹ https://www.3gpp.org/ftp/Specs/archive/25_series/25.331 (Ex. 1092).

⁷² https://web.archive.org/web/20131115195236/http://webapp.etsi.org/key/key.asp?full_list=y (Ex. 1083).

⁷³ https://www.3gpp.org/ftp/Specs/archive/25_series/25.331 (Ex. 1092).

125. This July 31, 2007 date is confirmed by the Internet Archive's September 2, 2007 capture of the 3GPP "archive" directory on the FTP server for the corresponding downloadable file ("25331-750.zip").⁷⁴

126. This July 31, 2007 date is further confirmed by the Internet Archive's September 7, 2007 capture of the 3GPP "latest" directory on the FTP server for the corresponding downloadable file ("25331-750.zip").⁷⁵

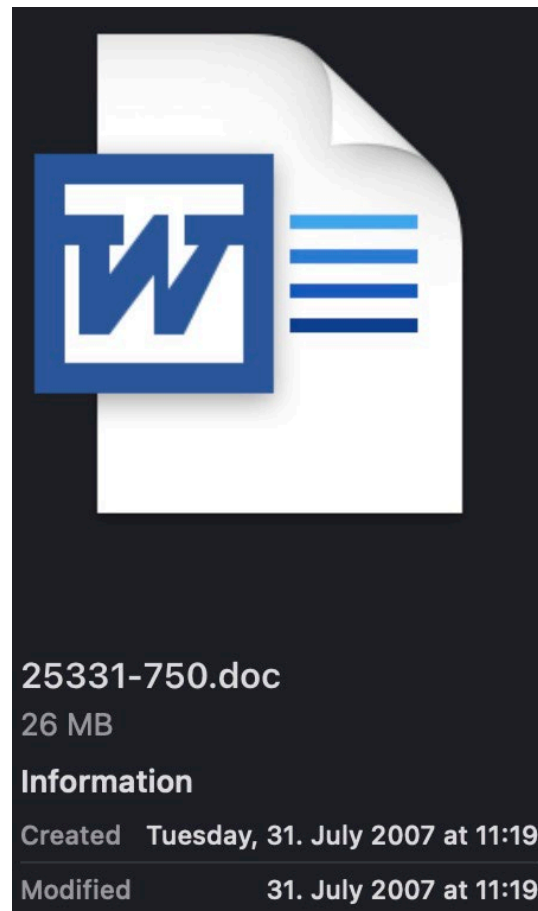
127. Experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the FTP server upload dates on the 3GPP FTP server as the date the document became available to the public and would consider the archived version of the directory structure maintained by the Internet Archive as further confirmation of the date of public availability.

128. In addition, metadata information for the downloaded and extracted specification file states a last Modified date of "31. July 2007"⁷⁶ as shown in the screenshot below:

⁷⁴ https://web.archive.org/web/20070902031859/http://www.3gpp.org:80/ftp/Specs/archive/25_series/25.331/ (Ex. 1093).

⁷⁵ https://web.archive.org/web/20070907224517/http://www.3gpp.org:80/ftp/Specs/latest/Rel-7/25_series/ (Ex. 1066).

⁷⁶ Ex. 1011.



This last modified date is consistent with the July 31, 2007 upload date of the document and 3GPP's standard business practice to upload technical specifications shortly after approval.

129. To the extent a member of the public was not already independently aware of TS 25.331, a member of the public would have been able to locate TS 25.331 V7.5.0 in a number of ways. As one example, and as explained in greater detail in Section IV, in 2007 a member of the public, such as a POSITA, would have identified the RAN WG2 as the responsible 3GPP working group for radio layers 2 and 3 and would have then reviewed a subject matter index of approximately 47

specifications for which RAN WG2 was responsible for.⁷⁷ For example, the RAN WG2 specifications page provided a subject matter description of TS 25.331 as concerning “Radio Resource Control (RRC); Protocol specification.” *Id.*

130. As a further example, and as explained in greater detail in Section IV, in 2007 a member of the public, such as a POSITA, would have considered the specification series page,⁷⁸ which identified the 25 series as related to “Radio aspects,” another subject matter descriptor for the content of 25.331, and would have been able to review the list of approximately 218 specifications within the 25 series on the FTP server.⁷⁹ Alternatively, the member of the public would have been able to use the “25 series” list of technical specifications as a further subject matter index of approximately 218 technical specifications within the 25 series, to identify TS 25.331 as concerning “Radio Resource Control (RRC).”⁸⁰

131. As a further example, and as explained in greater detail in Section IV, a member of the public, such as a POSITA, would have accessed the full index of

⁷⁷ <https://web.archive.org/web/20070525204220/http://www.3gpp.org:80/ftp/Specs/html-info/TSG-WG--R2.htm> (Ex. 1096).

⁷⁸ <https://web.archive.org/web/20070810002551/http://www.3gpp.org/specs/numbering.htm> (Ex. 1059).

⁷⁹ <https://web.archive.org/web/20070810232434/http://www.3gpp.org/ftp/Specs/html-info/25-series.htm> (Ex. 1060).

⁸⁰ <https://web.archive.org/web/20070810232434/http://www.3gpp.org/ftp/Specs/html-info/25-series.htm> (Ex. 1060).

specifications on 3GPP's website⁸¹ or the "3GPP Specification Release version matrix."⁸² The entry for 25.331 in the full index of 3GPP specifications included a title of "Radio Resource Control (RRC)," which serves as a subject matter descriptor for the content of TS 25.331, indicates that "R2," which is "RAN WG2," is the responsible working group, that the specification relates to releases R99, Rel-4, Rel-5, Rel-6, and Rel-7 and is an active specification.⁸³

132. The above examples illustrate that in 2007 it was straightforward for an interested member of the public without prior knowledge of the TS number to discover that TS 25.331 related to radio aspects of the 3G standard, specifically the radio resource control protocol.

133. Once the member of the public was aware of the 25.331 specification number, the member of the public, such as a POSITA, to the extent she was not already aware of the location of the technical specification on the 3GPP FTP server, would have then followed the instructions on the 3GPP webpages, as described in Section IV, to download the specification. For example, a member of the public would have reviewed the "3GPP Specifications – Numbering scheme" webpage link

⁸¹ <https://web.archive.org/web/20071101043800/http://www.3gpp.org/specs/3GPP-Spec-Titles.zip> (Ex. 1087 at 25).

⁸² <https://web.archive.org/web/20071112134824/http://www.3gpp.org/ftp/Specs/html-info/SpecReleaseMatrix.htm> (Ex. 1088).

⁸³ <https://web.archive.org/web/20071101043800/http://www.3gpp.org/specs/3GPP-Spec-Titles.zip> (Ex. 1087 at 25).

and been informed that “The latest versions of the approved specifications in the ‘latest’ directory” (<http://www.3gpp.org/FTP/Specs/latest/>) or that “[a]ll older versions of specifications (where available) are stored in the archive subdirectory. All versions of all releases of a given specification are placed directly under the name of the specification” (<http://www.3gpp.org/FTP/specs/archive/>).⁸⁴

134. As discussed above, TS 25.331 V7.5.0 was uploaded to the 3GPP FTP server on July 31, 2007 and was thereafter available for download from both the “archive” and “latest” directories on the 3GPP FTP server.

135. As discussed in Section IV, a member of the public, such as a POSITA, would have reviewed the instructions on the 3GPP webpages, such as the RAN WG2 specification page (*see* Ex. 1062 at 1) which lists all RAN WG2 specifications including their title and subject matter as shown above, and would have followed the hyperlink to a webpage to download the relevant TS 25.331 specification,⁸⁵ and then navigated to the relevant version (e.g., “7.5.0”). Alternately, after determining the desired specification, the 3GPP specifications webpage directed users to access the document from the 3GPP FTP server by following the “Quick link to the

⁸⁴ <https://web.archive.org/web/20070810002551/http://www.3gpp.org/specs/numbering.htm> (Ex. 1059).

⁸⁵ <https://web.archive.org/web/20070818215743/http://www.3gpp.org/ftp/Specs/html-info/25331.htm> (Ex. 1101).

specifications file server area (http),”⁸⁶ which would have brought the user to the “Specs” directory, which included links to both the “archive” and “latest” subfolders.⁸⁷ From the “archive” directory, the member of the public would have navigated to the relevant series (e.g., “25_series”),⁸⁸ relevant specification (e.g., “25.331”),⁸⁹ and finally the relevant version of the specification (e.g., “7.5.0”).⁹⁰ These steps would have been straightforward for a member of the public, such as a POSITA.

136. Alternatively, a member of the public, such as a POSITA, would have accessed the “latest” subfolder on the FTP server to obtain the current draft of a specification by navigating to the release folder for the specification (e.g., “Rel-7” folder),⁹¹ the specification series folder of interest (e.g., “25_series” folder),⁹² and

⁸⁶ <https://web.archive.org/web/20070820091849/http://www.3gpp.org:80/specs/specs.htm> (Ex. 1058).

⁸⁷ <https://web.archive.org/web/20070818015343/http://www.3gpp.org/ftp/Specs/> (Ex.1097).

⁸⁸ <https://web.archive.org/web/20070815092224/http://www.3gpp.org/ftp/Specs/archive/> (Ex. 1089)

⁸⁹ https://web.archive.org/web/20070815120847/http://www.3gpp.org/ftp/Specs/archive/25_series/ (Ex. 1098)

⁹⁰ https://web.archive.org/web/20070902031859/http://www.3gpp.org/ftp/Specs/archive/25_series/25.331/ (Ex. 1093).

⁹¹ <https://web.archive.org/web/20070901000715/http://www.3gpp.org/ftp/Specs/latest/> (Ex. 1099).

⁹² <https://web.archive.org/web/20070901000642/http://www.3gpp.org/ftp/Specs/latest/Rel-7/> (Ex. 1100). A POSITA interested in wireless communications in the 2007 timeframe would have known that Release 7 related to the current 3G release containing the latest technology.

then the relevant .zip file containing the version of the specification of interest within that folder (*e.g.*, “25331-750.zip”, where “750” represents version 7.5.0).⁹³

137. Thus, in 2007, members of the public interested in cellular communications and the development of wireless communication standards, including POSITAs, would have been aware of 3GPP’s standard business practices for the organization of documents on the FTP server, including the location of the technical specifications, and would have been able to locate TS 25.331 V7.5.0 without difficulty. To the extent the member of the public required additional information regarding the specific subject matter of particular specifications, the 3GPP website included multiple subject matter indices of specification series and individual specifications.

4. Conclusion

138. Thus, based on my personal knowledge and experience with ETSI’s and 3GPP’s standard business practices, Ex. 1011 is an authentic copy of TS 25.331 V7.5.0 that was published by 3GPP no later than July 31, 2007; published by ETSI by August 14, 2007; and was uploaded and made available via the 3GPP FTP server to the general public, where interested members of the public, such as POSITAs,

⁹³https://web.archive.org/web/20070907224517/http://www.3gpp.org/ftp/Specs/latest/Rel-7/25_series/ (Ex. 1066). After July 31, 2007, and until a new version of TS 25.331 was approved and uploaded to the 3GPP ftp server, 25.331 V7.5.0 would have been located within the 25331-750.zip in the latest subdirectory.

would have been able to locate the reference exercising reasonable diligence by July 31, 2007.

VI. AVAILABILITY FOR CROSS-EXAMINATION

139. In signing this declaration, I recognize that the declaration may be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will cooperate to the best of my ability to appear for cross examination within the United States during the time allotted for cross examination.

VII. RIGHT TO SUPPLEMENT

140. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

VIII. SIGNATURE

141. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Declaration of Friedhelm Rodermund

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: August 9, 2023

A handwritten signature in black ink, appearing to read 'F. Rodermund', written over a horizontal line.

Friedhelm Rodermund

Appendix A

CURRICULUM VITAE

I. PERSONAL DATA

Name: **Friedhelm RODERMUND**

Mailing address: Am Steiner Graben 18
56077 Koblenz, Germany

Phone: +49 172 2606489

Email: fred@iotecc.com

II. PROFESSIONAL EXPERIENCE

Summary

Senior expert in telecommunications and Internet of Things (IoT) technology. 25 years of experience within the mobile communications industry, and several years in the IoT domain in various roles such as project management, technology innovation and evolution, standards development, technology strategy, patent creation and patent litigations, and development/introduction of new services.

Recognized standards expert who was actively involved in leading roles in the development of key standards for mobile telephony/data and service enablers across standards development organizations such as 3GPP, ETSI, GSMA, IETF, OMA, and oneM2M. Currently focussing on standards for the Internet of Things.

Founder and director of IOTECC GmbH which provides consulting services around technologies and standards enabling the Internet of Things, and consulting and expert services related to patents for mobile telecommunications and IoT.

01/2015 – present IOTECC GmbH Koblenz, Germany

Founder and CEO

- Mobile telecommunications, Internet of Things (IoT) technology and standards consulting
- Telecommunications and IoT patent consulting
 - Consulting services around telecommunications and IoT patents in particular related to 3GPP, ETSI and OMA standards
 - State of the art/prior art research services related to patent creation e.g. for new 5G patents
 - Prior art research, essentiality assessment, patent infringement analysis related to litigations and validity actions
 - Advising on IP strategy
 - Advising on Standards Development Organisations (SDO) working processes and IPR policy
 - Experienced expert witness (please see section III for a list of supported actions)

11/2014 – 12/2014 Friedhelm Rodermund Consulting Koblenz, Germany

Internet of Things (IoT) Consultant

- IoT standards development and introduction of new IoT services

- Representing Vodafone in various standardisation bodies
- Creating technical standards for the Internet of Things
- Work item lead, technical editor and key contributor of Open Mobile Alliance (OMA) “Lightweight M2M (LwM2M)” – the new standard for the Internet of Things
- Advising and supporting various IoT/M2M projects related to e.g. automotive, smart metering, health, industry
- Advising on the introduction of new IoT/M2M technologies and services
- Leading Proof of Concepts of emerging technologies
- Involved in innovation projects
- Supporting the creation and protection of Intellectual Property

- Responsible for Vodafone's Device Management standardisation
- As OMA DM Vice Chairman, co-leading the group, chairing committee meetings and web conferences, steering the technical direction, management of the different work items
- Editor of several specifications, rapporteur of various work items
- Support of projects for the introduction of device management
- Delegate to 3GPP SA1 with responsibility for the introduction of MTC (machine type communications) related service/network requirements

- Responsible for Mobile Broadcast standardisation across different broadcast systems/standards bodies and across all Vodafone local operations
- Responsible for Mobile Broadcast standardisation strategy development and implementation
- Delegation Lead for the Open Mobile Alliance (OMA) BCASST working group
- Initiated and managed the BCASST device profile development in the BMCO Forum
- Leading the "Service Protection" (pay-TV) stream of the German DVB-H Consortium
- Filed several patents
- Supporting patent litigations and patent portfolio evaluation (various technical areas)

- Verification of the MMS operator interworking framework
- Supporting the definition and specification of the MMS functional evolution
- Acting as a “link” between 3GPP and GSMA in the area of MMS

CURRICULUM VITAE

06/1998 – 03/1999: Secretary ETSI SMG4 “Data Services” and SMG8 “Base Station Testing”

- Supported the establishment of 3GPP (3rd Generation Partnership Project) as the leading standards organization for mobile telecommunications
- Project manager and secretary of TSG “Terminals” responsible for Terminal Conformance Testing, Terminal Services and Capabilities, Universal Subscriber Identity Module (USIM)
- Project manager and secretary of Terminals Working Group 2 “Terminal Services and Capabilities” that was responsible for Terminal Execution Environments, Messaging including Short Message Service (SMS), Cell Broadcast Service (CBS), Enhanced Messaging Service (EMS), Multimedia Messaging Service (MMS), Terminal Interfaces incl. AT-commands, Generic User Profile, Data Synchronization and others
- Establishment and management of the Work Plan and follow-up and report on the progress of the related work items
- Advising the chairmen and the standards groups on technical, procedural and political issues
- Editorship of various GSM and UMTS technical specifications
- Responsible for presenting the technical results of the working groups to the parent body
- Responsible for the communication with other standards bodies inside and outside 3GPP
- PR activities (articles, interviews)

12/1993 – 06/1998 Mannesmann Mobilfunk GmbH

Düsseldorf, Germany

System Engineer and Project Manager in Quality Assurance and Technical Standards

- Leadership and management of acceptance test projects in the area of GSM Base Station Controller (BSC) and GSM Base Station (BTS) hardware and software.
- Leading project teams of around 15 people
- Responsible for the clearance of releasing new software/hardware into the network
- Supported Request for Quotations, supplier evaluation and pre-selection, project manager of System Verification as a central part of the supplier selection process.
- Representation of Mannesmann Mobilfunk to the ETSI standardization group “Standardization Technical Committee SMG3 System Architecture”
- Conduction of product and hardware development quality audits
- Representative of Mannesmann Mobilfunk in A-interface interoperability testing activities
- Member of BSS product planning group which was defining operator requirements for future BSS releases
- Development of process improvements for type acceptance

CURRICULUM VITAE

III. LIST OF SUPPORTED PATENT LITIGATIONS AND VALIDITY ACTIONS

2023

Apple Computer Trading (Shanghai) Co., Ltd, Apple Electronics Products Commerce (Beijing) Co., Ltd. v. Optis Cellular Technology LLC
Shenzhen, China, Intermediate People's Court
On behalf of Apple
Counsel: WilmerHale
Role: Expert witness and consulting services

2023

Apex Beam Technologies LLC v. Samsung
Inter Partes Review matters
On behalf of Samsung
Counsel: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.
Role: Expert witness and consulting services

2022

Constellation Designs LLC v. LG Electronics, Inc.
Inter Partes Review matters
On behalf of LG Electronics
Counsel: Fish&Richardson P.C.
Role: Expert witness and consulting services

2022

Unified Patents, LLC v. Togail Technologies LTD.
Inter Partes Review matters
On behalf of Unified Patents
Counsel: Duane Morris LLP
Role: Expert witness and consulting services

2022

Ericsson v. Apple
Certain Mobile Telephones, Tablet Computers With Cellular Connectivity, And Smart Watches With Cellular Connectivity, Components Thereof, And Products Containing Same, Inv. No. 337-TA-1299 (U.S.I.T.C.)
On behalf of Apple
Counsel: WilmerHale
Role: Expert and consulting services

2022

Ericsson v. Apple
Civil Action No. 2:21-cv-376 (E.D. Tex.)
On behalf of Apple
Counsel: WilmerHale
Role: Expert and consulting services

2022

Intellectual Ventures II LLC v. Toyota Motor Cooperation.
Inter Partes Review matters
On behalf of Toyota
Counsel: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.
Role: Expert witness and consulting services

2022

Ericsson v. Apple
2nd Business Court, Rio de Janeiro, Brazil
On behalf of Apple
Counsel: WilmerHale

CURRICULUM VITAE

Role: Expert and consulting services

2022

Ericsson v. Apple
Civil Court, Bogotá, Columbia
On behalf of Apple
Counsel: WilmerHale
Role: Expert and consulting services

2022

Proven Networks LLC. v. NetApp Inc.
Inter Partes Review matters
On behalf of NetApp
Counsel: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., Ropes & Gray LLP
Role: Expert witness and consulting services

2022

Ericsson v. Apple
Inter Partes Review matters
On behalf of Apple
Counsel: Fish&Richardson, Erise IP
Role: Expert witness and consulting services

2021

AEGIS 11 LLC v. Hisense Company, Ltd. and Hisense USA Corporation
Inter Partes Review matters
On behalf of Hisense
Counsel: Orrik Herrington & Sutcliffe LLP
Role: Expert witness and consulting services

2021

Nokia v. Lenovo
Certain Electronic Devices, Including Computers, Tablet Computers, and Components and Modules Thereof, Inv. No. 337-TA-1208 (U.S.I.T.C.)
On behalf of Lenovo
Counsel: WilmerHale
Role: Expert witness and consulting services

2021

Optis Cellular Technology LLC et al. v. Apple
Claim No. HP-2019-000006 (High Court of Justice, Business and Property Courts of England and Wales)
On behalf of Apple
Counsel: WilmerHale
Role: Expert witness and consulting services

2021

Ericsson v. Samsung
Inter Partes Review matters
On behalf of Samsung
Counsel: Kirkland&Ellis LLP, Fish&Richardson
Role: Expert witness and consulting services

2020

Panoptis Patent Management LLC et al. v. Apple Inc.
Civil Action No. 2:19-cv-66 (E.D. Tex.)
On behalf of Apple
Counsel: WilmerHale
Role: Expert witness at bench trial

2020

Sol IP, LLC v. AT&T Mobility, LLC et al.

CURRICULUM VITAE

Civil Action No. 2:18-cv-526 (E.D. Tex.)
On behalf of AT&T, Verizon, Sprint
Counsel: Gibson Dunn
Role: Expert witness and consulting services

2020

Bell Northern Research LLC v. LG Electronics Inc. et al.
Civil Action No. 18-CV-2864-CAB-BLM (S.D. Cal.)
On behalf of LG Electronics Inc.
Counsel: Fish&Richardson
Role: Expert witness and consulting services

2019

Conversant Wireless Licensing S.a.r.l. v. LG Electronics Deutschland GmbH
Civil Action No. 7 O 3277/18 (Landgericht Munich, Germany)
On behalf of LG Electronics Deutschland GmbH
Counsel: Wildanger Kehrwald Graf von Schwerin & Partner mbB
Role: Expert witness and consulting services

2019

Bell Northern Research, LLC v. Huawei Device Co., Ltd, et al.
Civil Action No. 3:18-cv-01784-CAB-BLM
On behalf of Huawei
Counsel: Fish&Richardson
Role: Expert witness and consulting services

2019

Uniloc USA, Inc., et al. v. Samsung Electronics America, Inc. and Samsung Electronics Co. Ltd.
Civil Action Nos. 2:18-cv-00040-JRG, 2:18-cv-00041-JRG, 2:18-cv-00042-JRG and 2:18-cv-00044-JRG (United States District Court for the Eastern District of Texas)
On behalf of Samsung
Counsel: Greenberg Traurig
Role: Expert witness and consulting services

2019

Uniloc USA, Inc., et al. v. Huawei Device USA, Inc. et al.
Civil Action No. 2:18-cv- 00072-JRG-RSP (E.D. Tex.)
On behalf of Huawei
Counsel: McGuireWoods
Role: Expert witness and consulting services

2019

Microsoft Corporation v. Uniloc 2017 LLC
Inter Partes Review of U.S. Pat. No. 7,167,487
Inter Partes Review of U.S. Pat. No. 7,075,917
On behalf of Microsoft and on behalf of Apple as joinder petitioner
Counsel: Klarquist Sparkman (Microsoft), Erise IP (Apple)
Role: Expert witness and consulting services

2019

Qualcomm v. KFTC
South Korean Case, Seoul High Court
On behalf of intervenor Apple supporting the KFTC
Counsel: Boies Schiller Flexner
Role: Expert witness

2018/19

Evolved Wireless, LLC v. Apple, Inc.
Civil Action No. 1:15-cv-00542-JFB-SRF
On behalf of Apple
Counsel: DLA Piper

CURRICULUM VITAE

Role: Expert witness and consulting services

2018/19

Cisco Systems Inc. v. Traxcell Technologies

Inter Partes Review of Traxcell Technologies patents

On behalf of Cisco

Counsel: King&Spalding

Role: Expert witness and consulting services

2018/19

Qualcomm Inc. v. Apple Inc.

Civil Action No. 3:17- cv-02398-DMS-MDD (United States District Court for the Southern District of California)

Civil Action No. 3:17-cv-02402-WQH-MDD

Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof (II), Inv. No. 337-TA-1093

Inter Partes Review of U.S. PATENT NO. 9,154,356

Cases IPR2019-00047, IPR2019-00048, IPR2019-00049, IPR2019-00128, IPR2019-00129

On behalf of Apple and Intel

Counsel: WilmerHale

Role: Expert witness and consulting services

2018/19

Apple Inc. v. Qualcomm Inc.

Civil Action No. 3:17-CV-00108-GPC-MDD (United States District Court for the Southern District of California)

On behalf of Apple

Counsel: Fish&Richardson, Boies Schiller Flexner

Role: Expert witness and consulting services

2018

3G Licensing, S.A. et al. v. LG Electronics Inc. et al

Inter Partes Review of U.S. Patent No. 7,995,091

On behalf of LG Electronics

Counsel: Fish&Richardson

Role: Expert witness

2017

Huawei Technologies Co. LTD. v. T-Mobile US, Inc. & T-Mobile USA, Inc.

E.D. Tex. Case Nos. 2:16-cv-00052-JRG-RSP; 2:16-cv-00055-JRG-RSP; 2:16-cv-00056-JRG-RSP; and 2:16-cv-00057-JRG-RSP

On behalf of T-Mobile

Counsel: Gibson Dunn

Role: Expert witness and consulting services

2016

Koninklijke KPN N.V. v. Samsung Electronics America, Inc. et al.

Civil Action No. 14-cv-1165

On behalf of Samsung Electronics

Counsel: Baker Botts

Role: Expert witness and consulting services

2016

SSH v. Sony

OLG Düsseldorf, Germany

On behalf of SSH

Counsel: Cohausz&Florack

Role: Technical expert support

2015/16

LG Electronics v. Core Wireless Licensing S.A.R.L.

Inter Partes Review of U.S. Patent No. 8,165,049

CURRICULUM VITAE

On behalf of LG Electronics
Counsel: Greenberg Traurig
Role: Expert witness

2015/16

Core Wireless Licensing S.A.R.L. v. LG Electronics Inc. and LG Electronics MobileComm U.S.A., Inc
Civil Action No. 2:14-cv-911 (lead case) and Civil Action No. 2:14-cv-912 (consolidated)
On behalf of LG Electronics
Counsel: Greenberg Traurig, Sidley Austin
Role: Expert witness

2015

Intellectual Ventures I LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.
D. Del. Case No. 1:13-cv-01632
Intellectual Ventures II LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.
D. Del. Case No. 1:13-cv-01633
On behalf of T-Mobile
Counsel: Gibson Dunn
Role: Technical expert support

IV. EDUCATION

- | | | |
|--------------------------|--|--------------------------|
| 10/1984 – 10/1993 | University of Technology Aachen | Aachen, Germany |
| | <u>Graduate of Electrical Engineering with a focus on telecommunications technologies (Dipl.-Ing. TH)</u> | |
| 10/1992 – 04/1993 | University of Technology Trondheim | Trondheim, Norway |
| | <u>Diploma Thesis "Design of a dual processor computer for digital signal processing in power electronics"</u> | |

V. LANGUAGES

German, English, French

VI. RECENT PUBLICATIONS

- "Unlocking the internet of things and driving the need for interoperability", Global Telecoms Business, December 2013
- "The need for standardisation in the M2M services layer", Global Telecoms Business, February 2014
- Co-authored white paper "Lightweight M2M: Enabling device management and applications for the internet of things", Open Mobile Alliance, March 2014
- "Objects are a new way to create M2M applications", Global Telecoms Business, April 2014
- "The need for standardisation in the M2M services layer", M2M Now, July 2015

Appendix B

List of Materials Considered

Exhibit	Description
1008	R2-073254, <i>Further discussion on enhanced CELL_FACH in REL8</i>
1009	3GPP Technical Specification TS 25.321 v7.5.0 (2007-06)
1011	3GPP Technical Specification TS 25.331 v7.5.0 (2007-06)
1051	Webpage, available at https://archive.org/legal/affidavit.php
1052	Internet Archive Capture, available at https://web.archive.org/web/20070705003208/http://www.3gpp.org/tb/home.htm
1053	Internet Archive Capture, available at https://web.archive.org/web/20070707102325/http://www.3gpp.org/
1054	Internet Archive Capture, available at https://web.archive.org/web/20070710032216/http://www.3gpp.org/tb/RAN/RAN2/RAN2.htm
1055	Internet Archive Capture, available at https://web.archive.org/web/20070701154418/http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/
1056	Internet Archive Capture, available at https://web.archive.org/web/20071129220816/http://www.3gpp.org:80/ftp/tsg_ran/WG2_RL2/TSGR2_55/
1057	Webpage, available at ftp.3gpp.org/Specs
1058	Internet Archive Capture, available at https://web.archive.org/web/20070820091849/http://www.3gpp.org:80/specs/specs.htm
1059	Internet Archive Capture, available at https://web.archive.org/web/20070810002551/http://www.3gpp.org/specs/numbering.htm

Exhibit	Description
1060	Internet Archive Capture, available at https://web.archive.org/web/20070810232434/http://www.3gpp.org/ftp/Specs/html-info/25-series.htm
1061	Internet Archive Capture, available at https://web.archive.org/web/20070905143259/http://www.3gpp.org/ftp/Specs/html-info/SpecReleaseMatrix.htm
1062	Internet Archive Capture, available at https://web.archive.org/web/20070525204220/http://www.3gpp.org/ftp/Specs/html-info/TSG-WG--R2.htm
1063	Internet Archive Capture, available at https://web.archive.org/web/20070523112802/http://www.3gpp.org/ftp/Specs/html-info/25321.htm
1064	3GPP TS 25.321 V7.4.0 (2007-03), retrieved from https://web.archive.org/web/20070523112802/http://www.3gpp.org/ftp/Specs/archive/25_series/25.321/25321-740.zip (25321-740.doc in 25321-740.zip)
1065	Internet Archive Capture, available at https://web.archive.org/web/20070602105532/http://www.3gpp.org/ftp/Specs/latest/Rel-7/
1066	Internet Archive Capture, available at https://web.archive.org/web/20070907224517/http://www.3gpp.org/ftp/Specs/latest/Rel-7/25_series/
1067	Internet Archive Capture, available at https://web.archive.org/web/20070704003509/http://www.3gpp.org:80/ftp/specs/latest/
1068	Internet Archive Capture, available at https://web.archive.org/web/20060105222647/http://list.etsi.org/scripts/wa.exe?SUBED1=3gpp_tsg_ran_wg2&A=1

Exhibit	Description
1069	Webpage, available at https://www.3gpp.org/FTP/tsg_ran/WG2_RL2/TSGR2_59/Docs/
1070	Webpage, available at https://list.etsi.org/scripts/wa.exe?A2=3GPP_TSG_RAN_WG2;3cceb99d.0708&S=
1071	R2-073254, retrieved from https://list.etsi.org/scripts/wa.exe?A3=ind0708&L=3GPP_TSG_RAN_WG2&E=base64&P=7845927&B=-----_%3D_NextPart_001_01C7DE81.00F02165&T=application%2Fzip-compressed;%20name=%22R2-073254.zip%22&N=R2-073254.zip&attachment=q&XSS=3 (R2-073254 Enhanced RACH.doc in R2-073254.zip)
1072	Internet Archive Capture, available at https://web.archive.org/web/20070714151920/http://list.etsi.org:80/
1073	Internet Archive Capture, available at https://web.archive.org/web/20070816051307/http://list.etsi.org/
1074	Internet Archive Capture, available at https://web.archive.org/web/20080719190403/http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Docs/
1075	R2-073254, retrieved from https://web.archive.org/web/20080719190403/http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Docs/R2-073254.zip (R2-073254 Enhanced RACH.doc in R2-073254.zip)
1076	Draft0 minutes of the 59 TSG-RAN WG2 meeting (Athens, Greece, 25-29 June 2007), available at https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Minutes/Draft0_Minutes_RAN2-59.zip (Draft0_Minutes_RAN2-59.doc in Draft0_Minutes_RAN2-59.zip)
1077	Webpage, available at https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Minutes

Exhibit	Description
1078	Excel file “3GPPRAN2_59.xls,” retrieved from https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Minutes/R2-074444.zip (3GPPRAN2_59.xls in R2-074444.zip)
1079	Draft3 minutes of the 59 TSG-RAN WG2 meeting (Athens, Greece, 25-29 June 2007) (R2-074444), retrieved from https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_59/Minutes/R2-074444.zip (Draft3_Minutes_RAN2-59.doc in R2-074444.zip)
1080	Webpage, available at https://www.3gpp.org/FTP/Specs/archive/25_series/25.321
1081	Webpage, available at https://www.etsi.org/deliver/etsi_ts/125300_125399/125321/07.05.00_60/
1082	ETSI Technical Specification 125 321 V7.5.0 (2007-06), retrieved from https://www.etsi.org/deliver/etsi_ts/125300_125399/125321/07.05.00_60/ts_125321v070500p.pdf
1083	Webpage, available at https://web.archive.org/web/20131115195236/http://webapp.etsi.org/key/key.asp?full_list=y
1084	Internet Archive Capture, available at https://web.archive.org/web/20070814155639/http://www.3gpp.org/ftp/Specs/archive/25_series/25.321/
1085	Internet Archive Capture, available at https://web.archive.org/web/20070827053924/http://www.3gpp.org:80/ftp/Specs/html-info/25321.htm
1087	Document entitled “3GPP specifications - List of all specification numbers and titles,” retrieved from https://web.archive.org/web/20071101043800/http://www.3gpp.org/specs/3GPP-Spec-Titles.zip (3GPP-Spec-Titles.doc in 3GPP-Spec-Titles.zip)

Exhibit	Description
1088	Internet Archive Capture, available at https://web.archive.org/web/20071112134824/http://www.3gpp.org/ftp/Specs/html-info/SpecReleaseMatrix.htm
1089	Internet Archive Capture, available at https://web.archive.org/web/20070815092224/http://www.3gpp.org/ftp/Specs/archive/
1090	Webpage, available at https://www.etsi.org/deliver/etsi_ts/125300_125399/125331/07.05.00_60/
1091	ETSI Technical Specification 125 331 V7.5.0 (2007-06), retrieved from https://www.etsi.org/deliver/etsi_ts/125300_125399/125331/07.05.00_60/ts_125331v070500p.pdf
1092	Webpage, available at https://www.3gpp.org/ftp/Specs/archive/25_series/25.331
1093	Internet Archive Capture, available at https://web.archive.org/web/20070902031859/http://www.3gpp.org:80/ftp/Specs/archive/25_series/25.331/
1095	3GPP Technical Specification TS 25.331 v7.5.0 (2007-06) printed in unmodified form, retrieved from https://www.3gpp.org/ftp/Specs/archive/25_series/25.331/25331-750.zip , and printed in modified form (25331-750.doc in 25331-750.zip)
1096	Internet Archive Capture, available at https://web.archive.org/web/20070525204220/http://www.3gpp.org:80/ftp/Specs/html-info/TSG-WG--R2.htm
1097	Internet Archive Capture, available at https://web.archive.org/web/20070818015343/http://www.3gpp.org/ftp/Specs/

Declaration of Friedhelm Rodermund

Exhibit	Description
1098	Internet Archive Capture, available at https://web.archive.org/web/20070815120847/http://www.3gpp.org/ftp/Specs/archive/25_series/
1099	Internet Archive Capture, available at https://web.archive.org/web/20070901000715/http://www.3gpp.org/ftp/Specs/latest/
1100	Internet Archive Capture, available at https://web.archive.org/web/20070901000642/http://www.3gpp.org/ftp/Specs/latest/Rel-7/
1101	Internet Archive Capture, available at https://web.archive.org/web/20070818215743/http://www.3gpp.org/ftp/Specs/html-info/25331.htm