

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COX COMMUNICATIONS, INC.
Petitioner

v.

C-CATION TECHNOLOGIES, LLC
Patent Owner

Case: IPR2015-_____

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 5,563,883**

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PETITIONER'S EXHIBIT LIST

Cox Ex. No.	Brief Description
1001	U.S. Patent No. 5,563,883 to Cheng
1002	Declaration of Stuart Lipoff
1003	<i>Curriculum Vitae</i> of Stuart Lipoff
1004	<i>Claim Construction Memorandum and Order</i> from <i>C-Cation Techs., LLC v. Comcast Corp., et. al.</i> , 2:11-CV-30-JRG-RSP, Dkt. 222 (Jul. 3, 2013)
1005	MPT 1327: <i>A Signalling Standard for Trunked Private Land Mobile Radio Systems</i> (Revised and reprinted November 1991) ("MPT 1327")
1006	MPT 1343: <i>Performance Specification; System Interface Specification for radio units to be used with commercial trunked networks operating in Band III sub-bands 1 and 2</i> (Revised and Reprinted September 1991) ("MPT 1343")
1007	MPT 1347: <i>Radio interface specification; For commercial trunked networks operating in Band III, sub-bands 1 and 2</i> (Revised and Reprinted September 1991) ("MPT 1347")
1008	U.S. Patent No. 4,870,408 to Zudnek
1009	U.S. Patent No. 4,920,533 to Dufresne <i>et al.</i>
1010	Radiocommunications Agency: 91-92 Annual Report
1011	William Stallings, <i>LOCAL AND METROPOLITAN AREA NETWORKS</i> (4th Ed. MacMillan Publishing Co. (1993))
1012	John Graham, <i>The Facts on File Dictionary of Telecommunications</i> (1983)
1013	C-Cation Technologies, LLC's Opening Claim Construction Brief in <i>C-Cation Techs., LLC v. Comcast Corp., et al.</i> , No. 2:11-cv-00030-JRG-RSP, Dkt. 187 (filed Mar. 22, 2013)
1014	Robert I. Desourdis, Jr., <i>et al.</i> , <i>EMERGING PUBLIC SAFETY WIRELESS COMMUNICATIONS SYSTEMS</i> (Artech House, 2001) (excerpts)
1015	Radiocommunications Agency Home Page (last visited 1/28/2015)
1016	U.S. Patent No. 5,117,501 to Childress <i>et al.</i>
1017	Thomas Farrell, <i>"A Computer Simulation Analysis of Convention and Trunked Land Mobile Radio Systems at</i>

Cox Ex. No.	Brief Description
	<i>Wright Patterson Air Force Base</i> ” (Jan. 19, 1989)
1018	International Application Publication No. WO 93/16566 (Aug. 19, 1993)
1019	International Application Publication No. WO 93/16530 (Aug. 19, 1993)

I. INTRODUCTION

Cox Communications, Inc. petitions for Inter Partes Review (“IPR”) under 35 U.S.C. §§ 311-319 and 37 C.F.R., Part 42 of claims 1, 3, and 4 of U.S. Patent No. 5,563,883 (“the ’883 Patent”) and shows herein that there is a reasonable likelihood that it will prevail by proving those claims are invalid.

The methods of “allocating signalling data channels,” Ex. 1001 at 14:30-32, based on various channel conditions recited in claim 1, 3, and 4 were well known to those having ordinary skill in the art by the July 18, 1994 filing date of the ’883 Patent. As demonstrated below, the challenged claims are invalid under § 103(a) as being obvious over a collection of related technical specifications promulgated by the British Ministry of Post and Telecommunications (“MPT”) relating to trunked radio communications. *See generally* Exs. 1005-1007 (collectively “the MPT Specifications”).

On July 31, 2015, the Patent Trial and Appeal Board granted-in-part the petition of ARRIS Group, Inc. for inter partes review of the ’883 patent in Case IPR2015-00635 (“ARRIS IPR”) finding there was “a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of claims 1, 3, and 4” on the following grounds of unpatentability:

A. Claims 1 and 4 under 35 U.S.C. § 103(a) as obvious over MPT 1343, MPT 1347, and MPT 1327; and

B. Claim 3 under 35 U.S.C. § 103(a) as obvious over MPT 1343, MPT 1347, MPT 1327, Zdunek, and Dufresne.

Pursuant to 35 U.S.C. § 315(c) and 37 C.F.R. §§ 42.22 and 42.122(b), Petitioner submits concurrently herewith a motion for joinder with the ARRIS IPR.

II. MANDATORY NOTICES – 37 C.F.R. § 42.8

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)

Cox Communications, Inc. is a real party-in-interest for the instant petition. CoxCom, LLC, a wholly owned subsidiary of Cox Communications, Inc., is also a real party-in-interest.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

The '883 Patent is asserted against Petitioner in *C-Cation Techs., LLC v. Atlantic Broadband Group LLC, et al.*, C.A. No. 15-295 (RGA) (D. Del.). The '883 patent is also asserted in *C-Cation Techs., LLC v. Time Warner Cable Inc., et al.*, No. 2:14-cv-00059 (E.D. Tex.). The '883 Patent is also involved in pending *inter partes* review Nos. IPR2015-00635 filed by ARRIS Group, Inc. and IPR2015-01045 filed by Unified Patents Inc. Unified Patents Inc. has also filed an Unopposed Motion for Joinder (Paper No. 11) to join the ARRIS IPR.

The '883 Patent was asserted in the following actions: *C-Cation Techs., LLC v. Cable One, Inc.*, No. 2:11-cv-00030 (E.D. Tex.) (filed Jan. 25, 2011; terminated Jan. 21, 2014); *Comcast Cable Commc'ns, LLC v. C-Cation, Inc.*, No. 1:11-cv-01922 (S.D.N.Y.) (filed Mar. 18, 2011; terminated Jan. 21, 2014). It was also the

subject of IPR2014-00454 filed by Cisco Systems, Inc.¹ and IPR2014-00746 filed by ARRIS Group, Inc.

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Lead Counsel	Back-Up Counsel
Mitchell G. Stockwell Registration No. 39,389	Michael J. Turton Registration No. 40,852

¹ The Board denied institution in IPR2014-00454. The petition in that proceeding was based in part on the MPT Specifications relied on herein. The board found that the petition failed to “provide sufficient articulated reasoning with rational underpinning explaining why one with ordinary skill in the art would modify the teachings of the applied references to arrive at the claimed invention.” *See Cisco Systems, Inc. v. C-Cation Technologies, LLC*, IPR2014-00454, Paper 12 at 14-15 (Aug. 29, 2014). ARRIS Group Inc.’s prior petition in IPR2014-00746 was based on a U.S. Patent to McNamara and institution against claims 1, 3, and 4 was denied because McNamara allegedly taught away from the claimed invention. Because: (1) the MPT Specifications are materially different from McNamara in that they do not include any alleged teaching away of a central controller as claimed; and (2) this petition and focuses on details of the MPT Specifications (alone or in combination with other references) that have never been addressed on the merits by the Office, the same, or substantially the same, prior art and arguments have not been presented to the Office before. *Cf.* 35 U.S.C. § 325(d) (2012).

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D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Service via hand-delivery may be made at the postal mailing address of either lead or back-up counsel. Petitioner consents to service by e-mail.

III. PAYMENT OF FEES – 37 C.F.R. § 42.103

The required fee is being paid through the Patent Review Processing System.

IV. REQUIREMENTS FOR IPR – 37 C.F.R. § 42.104 A.

A. Grounds for Standing Under 37 C.F.R. § 42.104(a)

Petitioner certifies that the '883 Patent is available for IPR. Petitioner does not own the '883 Patent. Neither Petitioner nor any real party-in-interest filed a civil action challenging the validity of a claim in the '883 Patent other than Defendants' Motion to Dismiss Patent Owner's complaint based on 35 U.S.C. § 101. *See C-Cation Techs., LLC v. Atlantic Broadband Group LLC, et al.*, C.A. No. 15-295 (RGA) (D. Del.) (Dkt. 14). This Petition has been filed less than one year after the date on which Petitioner, a real party-in-interest, or a privy of the Petitioner was served with a complaint alleging infringement of the '883 Patent.

Neither Petitioner, any real parties-in-interest, nor any privies of Petitioner are estopped from challenging the claims on the grounds identified in this Petition.

The timing of this Petition is also proper under 37 C.F.R. § 42.122(b). The ARRIS IPR for which joinder is requested was instituted less than one month ago on July 31, 2015, and this Petition is accompanied by a request for joinder filed as a motion under 37 C.F.R. § 42.22.

B. Identification of Challenge Under 37 C.F.R. § 42.104(b) and Relief Requested

Petitioner requests cancellation of claims 1, 3, and 4 of the '883 Patent in view of the following prior art references: (1) MPT 1327: *A Signalling Standard for Trunked Private Land Mobile Radio Systems* (“MPT 1327,” Ex. 1005); (2) MPT 1343: *Performance Specification* (“MPT 1343,” Ex. 1006); (3) MPT 1347: *Radio Interface Specification* (“MPT 1347,” Ex. 1007); (3) U.S. Patent No. 4,870,408 to Zudnek (Ex. 1008) (“Zudnek”); and (4) U.S. Patent No. 4,920,533 to Dufresne *et al.* (Ex. 1009) (“Dufresne”).

Each of these prior art references constitutes prior art under § 102 (pre-AIA) as demonstrated below.² Based on these references, and as explained in detail below, Petitioner presents the following grounds for trial:

² Statutory citations are to Title 35 of the United States Code unless otherwise noted.

Ground 1: Claims 1 and 4 would have been obvious under 35 U.S.C. § 103(a) over MPT 1343 in view of MPT 1327, and MPT 1347.

Ground 2: Claim 3 would have been obvious under 35 U.S.C. § 103(a) over MPT 1343 in view of MPT 1327 and MPT 1347 and further in view of Zudnek and Dufresne.

C. Claim Construction Under 37 C.F.R. §§ 42.100(b), 42.104(b)(3)

The '883 Patent has expired. The claims of an expired patent are construed according to the methodology set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*).

For the purposes of this proceeding, all terms should have their ordinary and customary meaning read in light of the '883 Patent's specification, as would have been understood by a person of ordinary skill in the art, except as otherwise discussed below.³ See, e.g., *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367,

³ Claims may be held obvious under § 103(a) even where the scope of a claim is not reasonably certain as required by *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S.Ct. 2120, 2124 (2014). In evaluating obviousness, what matters is whether a claim's scope encompasses that which is obvious—not whether the full reach of the claim is reasonably certain, the latter requirement being one of definiteness. “If [a] claim extends to what is obvious, it is invalid under § 103” and thus a showing that a claim extends at least as far as to cover “an obvious solution” to a recognized

1371 (Fed. Cir. 2014) (“Claim terms are generally given their plain and ordinary meanings to one of ordinary skill in the art when read in the context of the specification and the prosecution history.”).

In prior litigation, Magistrate Judge Payne construed certain terms of the ’883 Patent. As relevant to this proceeding, Magistrate Judge Payne construed the phrases “said predetermined signalling data channel” and “said predetermined channel,” present in claims 1 and 4, to mean “one of the pair of predetermined signalling data channels,” Ex. 1004 at 41-44, which the Court found supported by Exhibit 1001 at 8:44-50. Therefore, to the extent that the scope of the claims using these phrases are reasonably certain despite a lack of antecedent basis, Petitioner proposes using Magistrate Judge Payne’s construction for the purposes of this proceeding.

D. How the Construed Claims are Unpatentable under 37 C.F.R. § 42.104(b)(4)

An explanation of how construed claims 1, 3, and 4 are unpatentable under the grounds identified above, including the identification of where each element of the claim is found in the prior art patents and printed publications, is provided *infra*, § VII.

problem in the art may prove that claim obvious. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419-20 (2007).

E. Supporting Evidence under 37 C.F.R. § 42.104(b)(5)

Each of the grounds for trial is supported by the Declaration of Mr. Stuart Lipoff, Ex. 1002 and the other exhibits filed herewith. Mr. Lipoff's Declaration explains: the relevant level of ordinary skill in the art, how a person of ordinary skill in the art would have understood scope and content of the prior art, and the conclusions that such a person would have made regarding the obviousness of the subject matter claimed.

V. SUMMARY AND TECHNICAL BACKGROUND OF THE '883 PATENT

The '883 Patent relates to systems and methods for "facilitating the two-way multi-media communication based on a shared transmission media" *See, e.g.*, Ex. 1001 at 1:7-12; Ex. 1002, ¶¶ 36-37. This section summarizes some relevant aspects of the '883 Patent.

A. The Alleged Invention of the '883 Patent

The '883 Patent "pertains generally to methods and apparatus for facilitating two-way multi-media communication based on a shared transmission media such as coaxial cable-TV network, and more specifically to methods and apparatus for signalling channel management and protocol." Ex. 1001 at 1:7-12. After conceding that "[t]here are many proposals of means for dynamically adjusting the number of traffic-bearing channels according to varying traffic demands or the transmission quality in the radio telephony environment," Ex. 1001 at 1:60-64, the

'883 Patent claims that its novelty relates to “a dynamic process . . . to adjust the number of signalling channels to meet the requirements of varying traffic demand and the system growth,” *id.* at 2:44-46. As had already been recognized in the prior art, this “aids in . . . redundancy for anomalies such as interference and component failure.” *Id.* at 2:49-52. In addition to signalling data, the signalling channels can carry “sporadic user data.” *Id.* at 3:52-55; 7:41-43.

VI. LEVEL OF ORDINARY SKILL IN THE ART

As of July 18, 1994, a person having ordinary skill in the art relevant to the '883 Patent would have had an undergraduate degree in electrical engineering, or have had an equivalent educational experience, and three or more years working in a relevant field employing digital communications technology to deliver telecommunication services, or alternatively a relevant field involving the manufacture of telecommunication products. *See* Ex. 1002, ¶ 31; Ex. 1003; Ex. 1011 at viii; Ex. 1012 at 7 (discussing how telecommunications was being taught at the undergraduate level as of 1983). In this Petition, reference to a person having ordinary skill in the art refers to a person with these qualifications.

VII. DETAILED EXPLANATION UNDER 37 C.F.R. § 42.104(B)

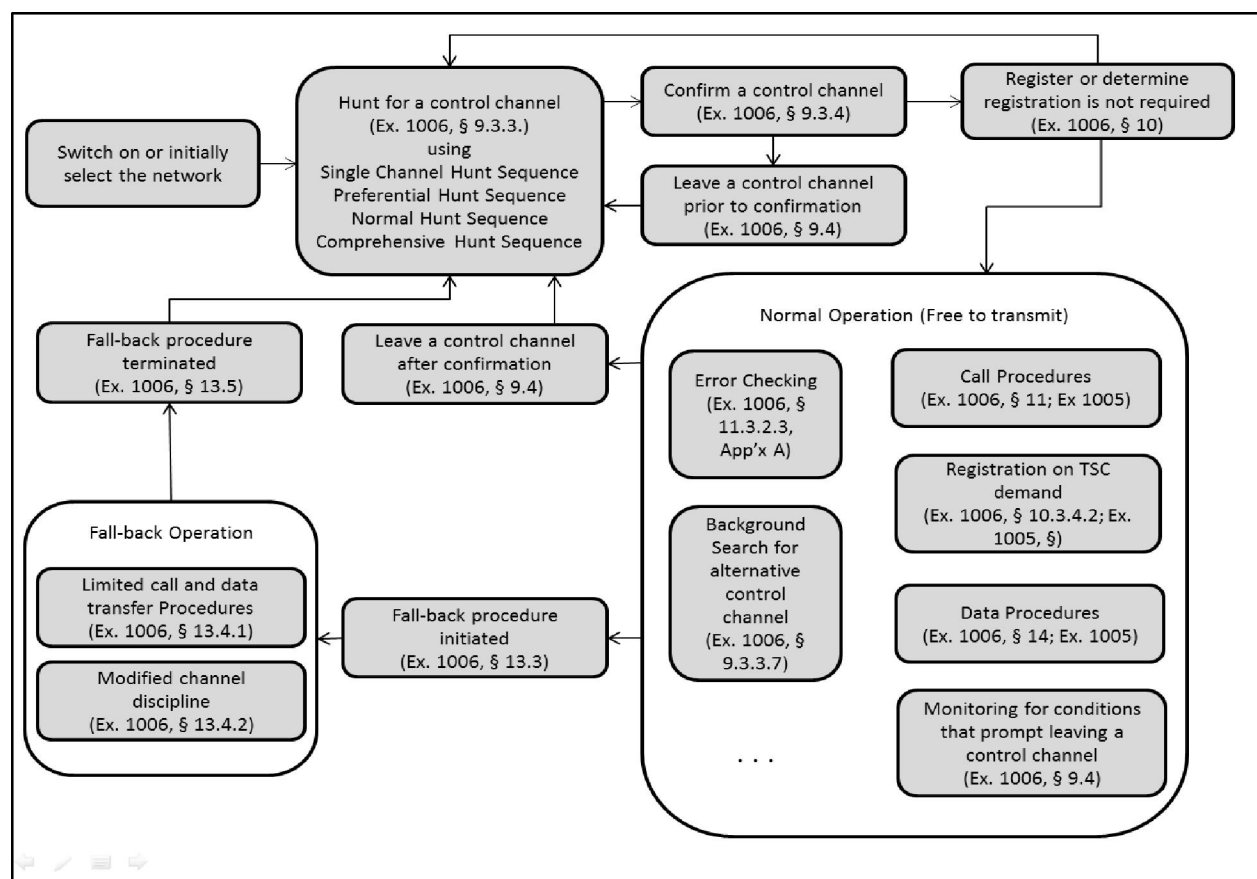
A. Overview of the MPT Specifications

1. Technical Overview of the MPT Specifications

The MPT Specifications are encyclopedic documents that describe system operations for the initiation and maintenance of communications in a standards-

compliant trunked radio network. *See, e.g.,* Ex. 1006, Foreword; Ex. 1002, ¶65.

The procedures used for establishing communications and maintaining those communications, as well as processes used during communication are described in various, interrelated sections. Each of the Specifications heavily references the others, and they are intended to be read together, as discussed in further detail below. The flowchart below illustrates how certain sections of the various MPT Specifications interrelate to one another to define specific system use cases.



Starting with a user initially turning on a radio unit or selecting a trunking network to connect to, the radio unit attempts to “acquire a control channel emanated by the

selected network.” Ex. 1006, § 9.3.3.1; Ex. 1002, ¶ 114. Depending on the information retained in memory, the way the radio unit is configured, and the available control channels, the radio unit executes one or more control channel hunting procedure to “locate” an “appropriate control channel.” *Id.*

For instance, when a radio that does not implement certain optional hunt stages is turned on and has a valid registration stored in memory from a prior use on the network, the radio unit executes the Single Channel Hunt Sequence and tunes to the channel indicated in the previous record. *Id.* at § 9.3.3.2.2; Ex. 1002, ¶ 71. If the Single Channel Hunt Sequence fails, the radio unit moves on to the Preferential Hunt Sequence, and so forth, until an appropriate control channel is located. *See, e.g.,* Ex. 1006, § 9.3.3.2.2. (“Upon unsuccessful completion of the ‘single channel hunt sequence’ the radio unit shall enter the ‘preferential hunt sequence’.”).

Once a proper control channel has been located, the radio unit attempts to confirm that control channel by testing the channel in accordance with the procedures of MPT 1343 § 9.3.4 before any transmissions on the control channel are allowed. *See, e.g.,* Ex. 1006, § 9.3.3.2.2. (“The radio unit shall not make any transmissions on a control channel until it has confirmed the channel in accordance with the procedure specified in 9.3.4 (including the error checking procedure specified in 9.3.4.4).”); Ex. 1002, ¶ 71. Control channel confirmation includes

several tests. Ex. 1002, ¶ 72. The radio unit determines that the control channel is appropriate to acquire by comparing the allowed category of radio units on that control channel (as contained in the LAB sub-field of the control channel's system identification code) to its own categorization retained in the radio units read only memory. Ex. 1006, § 9.3.4.2.5. The radio unit also determines if the control channel will be suitable by monitoring the error rate of that control channel and comparing that against threshold requirements. *Id.* at § 9.3.4.3 (“Whilst receiving a control channel a radio unit shall monitor the codeword error rate and count the codewords received with errors . . .”). If this error check fails then the radio unit leaves the control channel and returns to the control channel hunting procedures. *Id.* at § 9.4.1 (“Whilst active on a control channel, either prior to acquisition being confirmed or during activity subsequent to control channel confirmation, the radio unit shall monitor conditions on that channel and be prepared to leave the control channel and return to the control channel hunting procedures.”). If the testing succeeds then the hunt sequence is considered complete and the control channel confirmed. *Id.* at § 9.3.4.4; Ex. 1002, ¶ 72.

Once a control channel is confirmed, the radio unit determines whether it is required to register before it is able to transmit freely. Ex. 1006, § 10.2.3; Ex. 1002, ¶ 73. Registration is “a method of recording the area or group of areas where a radio unit is likely to be located within a network.” Ex. 1006, § 10.1.1.

Registration also “provides a means of restricting the service of individual radio units by allowing the network to deny registration requests.” *Id.*

For basic registration, the radio unit determines if it is required to register based on the mode of the system (*e.g.*, fall-back where registration is not required or normal operations where it may be), as well as based on the data retained in memory and broadcast on control channels. *Id.* at § 10.2.3 (“If the verified AREA code is zero, or the radio unit is personalised with a zero length AREA field, or the radio unit is in fall-back mode, the radio unit shall not seek to register by random access nor shall it create or alter any registration record.”); Ex. 1002, ¶ 72. If the radio unit determines registration is not required, it is free to transmit on the confirmed control channel. Ex. 1006, § 10.2.3 (“The radio unit shall note that registration is not required and that it is free to initiate calls.”).

If registration is required, however, the radio unit checks to see if it holds a successful registration. *Id.* If not, the radio unit proceeds to execute the registration procedures of MPT 1343 § 10.2.4, which are either allowed, denied, or failed by the TSC. *See, e.g.*, Ex. 1006, § 10.2.3; Ex. 1005, § 8.2.1.2; Ex. 1002, ¶ 74. If the registration is denied or failed, the radio unit defaults back to the control channel hunting procedures. *See, e.g.*, Ex. 1006, §§ 10.2.4.1.2 & 10.2.4.1.3; Ex. 1002, ¶ 74. If the registration is accepted the radio unit records a local copy of the registration record, Ex. 1006, § 10.2.4.1.1, and is free to transmit, *id.* at § 10.2.3

(“At any time that the radio unit holds a successful registration record relating to the verified AREA code, it is free to transmit . . .”).

Once registered, the radio unit enters normal operations on the network. This consists of making and receiving calls, Ex. 1006, § 11, sending and receiving data messages, *id.* at § 14, responding to subsequent registration demands by the TSC, *id.* at § 10.3.4.2, and monitoring of the control channels for *inter alia* errors, *id.* at § 11.3.2.3 & App’x A. Additionally, radio units may perform background searches for alternative control channels which “may offer greater spectral efficiency” or result in “improved quality of service to the user” while confirmed on a control channel. *Id.* at § 9.3.3.7; Ex. 1002, ¶ 156. The radio unit also monitors for a variety of conditions and receipt of specific messages that prompt the radio unit to re-enter the control channel hunting procedures as dictated by MPT 1343 § 9.4.1. Ex. 1002, ¶¶ 140-141.

In the event of a network failure, the network may implement a fall-back procedure to provide a reduced network capability until normal function is restored. *See* Ex. 1006, § 13; Ex. 1002, ¶ 80. This is a standard option for radio units and for standards-compliant MPT-based systems. Ex. 1006, § 13.1. When fall-back operation is signaled, “[e]ach radio unit . . . [relapses] to a pre-programmed channel” where “all members of a fleet [are] programmed with the same channel number.” *Id.* Modified procedures and limited call procedures are

utilized while in fall-back mode. *Id.* at § 13.4; Ex. 1002, ¶ 81. However, at least simple call messaging and data transfer messaging are allowed. Ex. 1006, § 13.4.1 (“ALHF invites the following types of call request: RQS, RQX, RQT, RQE, RQQ and RQC” where “RQS” is a request for a simple call message and “RQC” is a request to transmit a short data message.); Ex. 1002, ¶ 135.

Fall-back procedures may be terminated through either: (1) the network signalling the exit from fall-back, or (2) the user selecting to transfer to a different network. Ex. 1006, § 13.5. Additionally, the MPT Specifications recommend that “the radio unit hunts occasionally for a normal operation mode control channel, regardless of the quality of the channel and whether or not the radio unit is active.” *Id.*; Ex. 1002, ¶ 158. In each case the radio unit re-enters the control channel hunt sequence specific to the method through which the termination of fall-back procedures was achieved. Ex. 1006, § 13.5 (“Under any of the following conditions the radio unit shall exit from fall-back mode, abandon any call set-up or transaction in progress, and enter the control channel acquisition procedures”). For example, upon receiving a MOVE message where the control channel is specified through a non-zero value in the CONT field of the message, the radio unit enters the Single Channel Hunt Sequence. Ex. 1006, § 9.3.3.2.2 (“The receiver shall be tuned to receive the nominated channel within 35ms of the following instants . . . the end of any MOVE message that is applicable to the radio

unit and in which the value of the CONT field is not 0.”); Ex. 1002, ¶ 160. The radio unit will then progress normally through the control channel hunting procedures, confirmation, and registration until re-entering normal operations and able to transmit freely. Ex. 1002, ¶¶ 158, 161.

Thus, the MPT Specifications describe various processes for establishing and maintaining communications in a standard-compliant MPT-based network. As shown below, these standards disclose all features of claims 1 and 4, and, at the very least, render claim 3 obvious when taken in view of additional prior art.

2. The MPT Specifications Are Printed Publications

Before the July 18, 1993 § 102(b) critical date of the ’883 Patent, each of the MPT Specifications had been “made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence [could] locate” these documents. *In re Wyer*, 655 F.2d 221, 226 (C.C.P.A. 1981). “[P]ublic accessibility’ has been called the touchstone in determining whether a reference constitutes a ‘printed publication’” under the Patent Act. *In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986). The evidence shows that the MPT Specifications were publicly accessible to members of the interested public.

First published in 1988 by the U.K. Department of Trade and Industry (“DTI”), the MPT Specifications would come to be administered by The Radiocommunications Agency (“The RA”) by 1992. *See* Ex. 1014 at 317. The

RA is an Executive Agency of DTI. Ex. 1015; Ex. 1010 at Front Cover. The MPT Specifications relied upon in this petition bear publication dates of September or November 1991, as reflected on the first page of each Exhibit. *See* Exs. 1005-1007. The 1991-1992 Annual Report of The RA indicates (referring to Part 10 of the Annual Report), between 1991 and 1992, “[t]he Agency published eleven new or revised MPT standards during the year.” Ex. 1010 at 24. These MPT standards “continue to be available free of charge” from The RA’s Library. *Id.* Part 10 of the 1991-1992 Annual Report lists MPT Specifications published between April 1, 1991 and March 31, 1992, refers to MPT 1327, MPT 1343, and MPT 1347, *see* Ex. 1010 at 35, and provides a mailing address and telephone number to allow requests for copies of the MPT Specifications, *id.* at 33. Therefore, the MPT Specifications were publicly accessible well before the July 18, 1993 critical date and are thus printed publications.

3. The Functionalities Defined By the MPT Specifications Were Intended to be Combined

The MPT Specifications are so interrelated, and cross-reference one another so extensively in relevant respects that they constitute a single reference. However, the Board need not decide whether these three references are a single reference since, at the very least, a person of ordinary skill in the art at the time of the alleged invention would have understood that the MPT Specifications define portions of an interrelated trunked radio system, such that their teachings would

have been naturally combined to form an MPT-compliant network having stationary network equipment and radio units, thereby rendering the claimed subject matter obvious. *See* Ex. 1002, ¶¶ 169-70. Additionally, the various MPT Specifications reference one another explicitly. *See, e.g.*, Ex. 1005 at Foreword (referring to *inter alia* MPT 1343 and MPT 1347); Ex. 1006 at ii (“[a] companion specification, MPT 1347, contains the additional minimum performance requirements to be met by network fixed equipment.”); *id.* at § 1.1 (“MPT 1343 is designed to be read in association with MPT 1327”); *id.* at § 2 (referring to MPT 1327 and MPT 1347 as “associated documents”); Ex. 1007 at i (“MPT 1343[] contains the requirement to be met by radio units to be used with these networks.”); *id.* at § 2 (listing *inter alia* MPT 1327 and MPT 1343 as “associated documents”). Before the ’883 Patent’s critical date, those skilled in the art referred to MPT 1327, 1343, and 1347 as “associated documents” as well. *See, e.g.*, Ex. 1018 at 2 (“A trunking technique, as described in MPT 1327 (and associated documents MPT 1343 and MPT 1347)”); *see also* Ex. 1019 at 2 (describing MPT 1327 and 1343 as kind of *de facto* standards in Europe for private mobile radio networks). Therefore, a person of ordinary skill in the art would have been motivated to look to each of these documents for teachings regarding design of a network compliant with the MPT Specifications. *See* Ex. 1002, ¶ 171. This rationale applies to all combinations of the teachings of the various MPT

Specifications as discussed below. Additional modifications to the teachings of the MPT Specifications based on the Zudnek and Dufresne references are discussed in detail below in Ground 2, as applicable.

B. Ground 1: Claims 1 and 4 are Invalid Under 35 U.S.C. § 103(a) As Obvious Over MPT 1343 In View of MPT 1347 and MPT 1327

As shown below, claims 1 and 4 claim subject matter that was described by MPT 1343, MPT 1327, and 1347 in a manner that would have led a person of ordinary skill in the art to the claimed subject matter through the exercise of only routine skill, since these references were intended to be used to design a standards-compliant trunked radio network and components for use in such a network. *See* Ex. 1002, ¶¶ 85, 199.

1. Claim 1

- a. Preamble: “In a multiple access communication system comprising a central controller, a shared transmission means for signalling data and user information, and a plurality of remote terminals, a method of allocating signalling data channels between said central controller and said plurality of remote terminals from a plurality of communication channels and of assigning remote terminals”*

As C-Cation argued, and Judge Payne found, the preamble of claim 1 is non-limiting. *See* Ex. 1004 at 16; Ex. 1013 at 5-6. The Board need not resolve this question because even if the preamble were construed to be a limitation in this proceeding, the MPT Specifications disclose the various aspects of the preamble and would have rendered the subject matter of the preamble obvious.

Multiple access communication system. The MPT Specifications define a multiple access communication system based on slotted Aloha. Ex. 1005, § 1.3.3.1 (“In this standard, the problems of clashing are controlled by a random access protocol which is based on slotted Aloha”). Slotted Aloha is a protocol used in multiple access communications systems, *see* Ex. 1002, ¶ 87, as the ’883 Patent itself acknowledges, *see* Ex. 1001 at 1:40-43. Moreover, the MPT Specifications provide for multiple access by dividing various frequency bands into individual frequency channels. *See* Ex. 1006, §§ 4.1 (describing radio unit requirements for channel operation based on frequency); 4.1.1 & 4.1.2 (defining transmission channel frequencies for channels 1 to 560); 5.1.1 & 5.1.2 (describing reception channel frequencies 1 to 560 for “sub-band 1”). These descriptions make clear that the MPT Specifications define a frequency divided multiple access system. Ex. 1002, ¶ 88. The ’883 Patent admits that frequency division defines a multiple access communication system. Ex. 1001 at 1:15-23; Ex. 1002, ¶ 88. Moreover, by defining requirements for a trunked network, *see, e.g.*, Ex. 1006 at ii (referring to “commercial trunked networks”), a person of ordinary skill in the art would have recognized that the MPT Specifications defined a network that allowed “a large group of users to share a relatively small number of channels,” *see* Ex. 1002, ¶ 89 (citing Exs. 1017 & 1019 as describing multiple access nature of trunked communications systems, like those defined by the MPT Specifications).

A central controller. In the MPT Specifications, a “Trunking System Controller” (“TSC”) is defined as “[t]he central control intelligence necessary to enable the trunking system to function according to MPT 1327.” Ex. 1006, § 3.1 (definition of “Trunking System Controller (TSC)”). Based on the MPT Specifications, the TSC controls a number of processes, including, for example, controlling the registration process, *see* Ex. 1005, §§ 8.1 & 8.2 (TSC “control[s] the generation of registration requests by the radio unit population”), and the allocation of channels, *id.* at § 1.2.3 (describing check procedure to avoid “wasted channel assignments”). *See also* Ex. 1002, ¶ 90. Since the TSC is the “central control intelligence,” it is a central controller. *See* Ex. 1002, ¶ 90.

A shared transmission means for signalling data and user information. The shared transmission means utilized by MPT is an RF or airwave transmission medium, *see* Ex. 1002, ¶ 91, one of the shared transmission media referenced by the ’883 Patent, *see* Ex. 1001 at 1:39-49 (discussing radiotelephony transmission systems), 1:60-66 (same).⁴ MPT 1343 defines radio frequency channels in Sub-bands 1 and 2 for both transmission and reception of wireless transmissions. *See*

⁴ Patent Owner has argued that airwaves are a shared transmission means under the ’883 Patent. *See* Ex. 1013 at 6 (“[T]hese [shared transmission means] terms are easily understood in the context of this patent as simply the medium, such as cable, wires or airwaves by which a terminal and a central controller communicate.”).

Ex. 1006 §§ 4.1.1, 4.1.2, 5.1.1 & 5.1.2; Ex. 1002, ¶ 93. The airwaves are shared by a number of radio units. *See, e.g.*, Ex. 1005, § 7.2.2 (describing dividing “the radio unit population into subsets,” thus describing multiple radio units); Ex. 1002, ¶ 94. The airwaves are used to transmit signalling data, such as, *inter alia*, “Go To Channel” messages, which are “[s]ent by the TSC to allocate traffic channels.” Ex. 1005, § 1.3.2. The “Go To Channel” message instructs “both radio units [a called and a calling radio unit] to switch to the specified traffic channel for their call.” *Id.* at § 1.3.5.2. Because the “Go To Channel” message is data that is used in the establishment of a call, it constitutes “signalling data.” *See* Ex. 1012 at 146-47; Ex. 1002, ¶ 95; *see also* Ex. 1005, § 1.2.2 (“The signalling for setting up calls is transmitted on a ‘control’ channel.”). The airwaves carry user data—*i.e.*, “user communications,” over at least the traffic channels. Ex. 1006, § 3.1 (definition “Traffic Channel”); *see also* Ex. 1002, ¶ 95.

A plurality of remote terminals. The MPT Specifications describe multiple remote terminals, called “radio units.” *See, e.g.*, Ex. 1006, § 3.1 (“Radio Unit” definition). Multiple radio units are referred to as the “radio unit population,” which may be sub-divided. *See, e.g.*, Ex. 1005, § 7.2.2 (“The TSC may divide the radio unit population into subsets”); Ex. 1006, § 8.2.2.2 (showing multiple fleets in a MPT system with multiple (70, 196, 22) units in a fleet); *id.* at § 9.5.1 (“Commercial networks . . . may require the subdivision of the radio unit

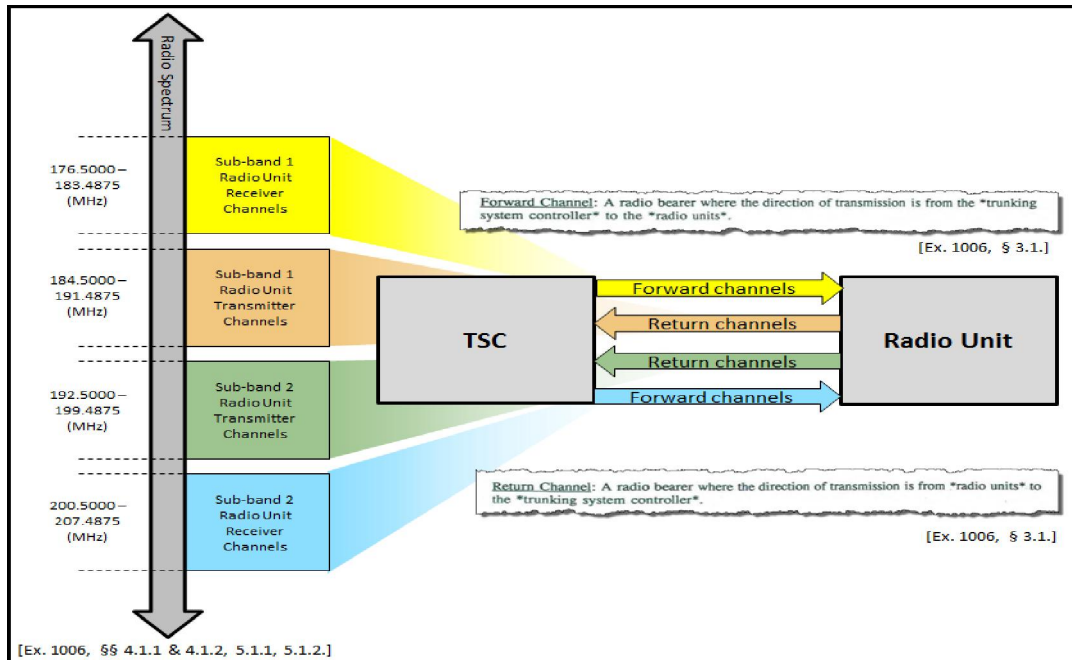
population to allow load sharing between control channels.”). That the “radio unit population” may be subdivided teaches more than one radio unit, *see* Ex. 1002, ¶ 97, and is consistent with the purpose of trunked radio networks, *see, e.g.*, Ex. 1019 at 2 (describing “trunked networks” as those in which “several user groups or even several user organizations share the same radio channels”), Ex. 1017 at ix (“Trunked land mobile radio systems . . . allow many groups of land mobile radio (LMR) users to share a set of channels dynamically”); Ex. 1002, ¶ 98. By the very nature of radio communication, the radio units are remote from the TSC.

A method of allocating signalling data channels . . . from a plurality of communication channels and of assigning remote terminals. The MPT Specifications disclose “a procedure . . . whereby channels used by the *system* may be flexibly allocated as *control channels* or *traffic channels* depending on the traffic load of the system.” Ex. 1006, § 3.1 (“Non-dedicated” definition); *see also id.* at § 9.1 (disclosing non-dedicated control channels). That “channels” (plural) is disclosed means there is a plurality of communication channels. Ex. 1002, ¶ 101. Additionally, as discussed in further detail below, the MPT Specifications disclose at least two methods of assigning remote terminals to the signalling data channels.

- b. *Limitation [A]: “establishing communications between said central controller and said plurality of remote terminals via a plurality of signalling data channels, each of said remote terminals being initially assigned to a pair of predetermined signalling data channels”*

This process step is described as being performed during at least two separate operations according to the MPT Specifications. The first is called the “Single Channel Hunt Sequence.” After communications have been established using the Single Channel Hunt Sequence, the radio units operate normally on the control channel. The second is called the “fall back” procedure.

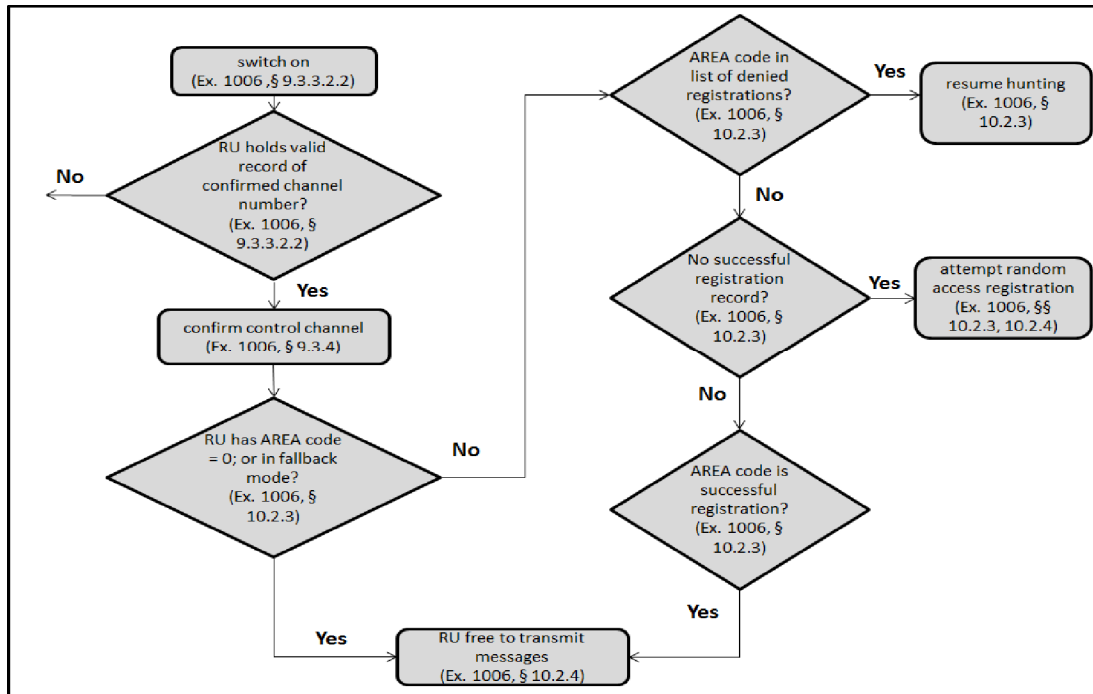
Regardless of which procedure is examined, for the purposes of this analysis, the TSC is a “central controller,” as discussed above. *See supra* § VII.B.1.a. Each control channel is, in actuality, a pair of channels: a forward channel and a return channel, as shown in the illustration below. *See Ex. 1006* § 3.1 (“A *forward channel* and *return channel* being used for the transmission of *messages* conforming to MPT 1327 with the primary purpose of enabling the [TSC] to control *radio units*.”); *see also Ex. 1006*, §§ 4.1.1, 4.1.2, 5.1.1, and 5.1.2; *Ex. 1007*, § 9.2 (referring to “control channel frequency pairs”); *Ex. 1002*, ¶ 100. As shown in the illustration and described in the referenced portions of the MPT Specifications, signalling data and traffic bearer channels are frequency multiplexed in both the forward and return (*i.e.*, reverse) directions over the channel pairs. *Ex. 1002*, ¶ 100.



The control channels are signalling data channels in that they carry messages, such as "Go To Channel" messages, which are "[s]ent by the TSC to allocate traffic channels." Ex. 1005, § 1.3.2. The "Go To Channel" message instructs "both radio units [a called and a calling radio unit] to switch to the specified traffic channel for their call." *Id.* at § 1.3.5.2. Because the "Go To Channel" message is data that is used in the establishment of a call, it constitutes "signalling data." See Ex. 1012 at 146-47; Ex. 1002, ¶ 99. Finally, as discussed above, the MPT Specifications disclose multiple remote terminals, *i.e.* "radio units" to a person of ordinary skill in the art. See *supra* § VII.B.1.a.

i. Limitation [A], Example 1: Channel Hunt Sequence and Normal Operation on Control Channel

Establishing Communications. MPT 1343 discloses establishing communications between a TSC and radio units via a plurality of control channels. When a radio unit is “switched on whilst still retaining valid information from previous activity on the selected network,” Ex. 1006, § 9.3.3.2.2, the radio unit’s receiver will tune immediately to the control channel, provided the radio unit does not implement “the optional ‘preferential NDD sub-set hunt stage,’” *id.* Before a radio unit may freely transmit on a control channel, thereby allowing user information to be transmitted and received, the radio unit must (1) confirm the channel in accordance with MPT 1343 § 9.3.4, and (2) must register on the channel or conclude it need not register in accordance with MPT 1343 § 10.2.3. *See, e.g.*, Ex. 1006, §§ 9.3.3.2.2, 9.3.4 & 10.2.3; Ex. 1002, ¶¶ 114 & 118. The following flow chart shows how communications are established using the single channel hunt sequence.



When a radio unit is switched on, it determines whether it holds “valid information from previous activity on the selected network.” Ex. 1006, § 9.3.3.2.2. If so, “[t]he receiver shall tune immediately to the nominated channel,” but “shall not make any transmissions on a control channel until it has confirmed the channel in accordance with the procedure specified in 9.3.4” *Id.* The control channel is then confirmed according to MPT 1343 § 9.3.4, which concludes the hunt sequence. *See* Ex. 1006, § 9.3.4.4. Once the radio unit has confirmed a control channel, it then determines whether the “verified AREA code is zero, or if the radio unit is personalized with a zero length AREA field, or the radio unit is in fallback mode” Ex. 1006, § 10.2.3. If the control channel has been confirmed, the radio unit is free to initiate calls, so that user information can be transmitted and received, and communication has been established. *Id.* If the verified AREA

code “is in the list of denied registrations,” the radio looks for a new control channel *via* a hunt procedure. *Id.* If there is no valid registration record, then “the radio unit shall attempt to register by random access,” as specified in MPT 1343 § 10.2.4. *Id.* If successful, then communications are established, “commencing the session.” *See* Ex. 1006, § 10.2.4.1.1. If the radio “holds a successful registration record,” it need not register again. Ex. 1006, § 10.2.3. “At any time that the radio unit holds a successful registration record relating to the verified AREA code, it is free to transmit any message” *Id.* By completing a successful registration and being able to freely transmit and receive any messages (including user information), communications are established via a plurality of signalling data channels—*i.e.*, MPT’s control channels. *See* Ex. 1002, ¶ 118.

Plurality of signalling data channels. MPT 1343 discloses “multiple control channels at a single site.” Ex. 1006, § 9.5.1. MPT 1343 also discloses division of the radio unit population between control channels. *See id.* at § 9.5.1 (describing “subdivision of the radio unit population . . . between control channels”). Since the radio units may be divided among control channels, a person of ordinary skill in the art would have understood that communications are established between the TSC and the radio units via a plurality of control channels. *See* Ex. 1002, ¶¶ 110-111.

Each of said remote terminals being initially assigned to a pair of predetermined signalling data channels. Each of the remote terminals are “initially assigned to a” predetermined control channel pair in that, when the radio unit is powered on, it retains “valid information from previous activity on the selected network,” and “shall tune immediately to the nominated channel . . . provided that the unit holds a valid record of the channel number on which the radio unit was most recently confirmed” Ex. 1006, § 9.3.3.2.2. In this use case, since radio units hold a control channel number, that number is “initially assigned” and the control channels are “predetermined” in that they are determined before the radio unit is powered on. *See* Ex. 1002, ¶ 119. To the extent that it could be argued that “each” of at least two radio units is not initially assigned to a pair of predetermined signalling data channels, it would have been obvious to allow all radio units to store records of the channel number on which the radio unit was most recently confirmed because a person of ordinary skill in the art would have recognized that this would, in many cases, speed up the control channel confirmation and registration process and thereby improve the usability of the network. *See, e.g.,* Ex. 1002, ¶ 121.

ii. Limitation [A], Example 2: Fall-back Procedures

Establishing Communications. MPT 1343 further discloses establishing communications between a TSC and radio units via fall-back channels. *See*

generally Ex. 1006, § 13. If a radio unit receives an ALHF (fall-back mode) message “while active on a control channel,” the radio unit attempts “to find and confirm an alternative control channel.” *Id.* at § 13.3. “If the radio unit fails to find and confirm a normal operation mode control channel . . . , it shall tune to its pre-programmed fall-back channel, and attempt to confirm the fall-back channel.” *Id.* Once the fall-back channel is confirmed, “the radio unit is free to initiate and receive calls.” *Id.* at § 13.4.1; *see also id.* at § 10.2.3 (indicating that a radio unit that is in fall-back mode need not register to make calls). Radio units in fall-back mode can transmit and receive user information. Each fall-back channel “alternate[s] between being a control channel . . . and a traffic channel.” *Id.* at § 13.1. By confirming fall-back channel, each of which acts as both a control channel and a traffic channel, MPT 1343 discloses establishing communications between the TSC and the radio units via signalling data channels. *See* Ex. 1002, ¶ 123.

Plurality of signalling data channels. The claimed “plurality of signalling data channels” is evident from the fact that “all members of a fleet would be programmed with the same channel number,” and that “[t]he network may operate each of these channels independently, as a set of single channel systems.” Ex. 1006, § 13.1. The disclosure of multiple fall-back channels which may be operated “independently, as a set of single channel systems,” coupled with the disclosure

that the fall-back channels act as both traffic and control channels, discloses establishing communications “via a plurality of signalling data channels.” *See* Ex. 1002, ¶ 124.

Each of said remote terminals being initially assigned to a pair of predetermined signalling data channels. Each of the radio units is “initially assigned to a pair of” fall-back channels, in that the fall-back channels operate as control and traffic channels, both of which are defined as having forward and return channel pairs. *See, e.g.,* Ex. 1006, § 3.1 (definitions of “Control Channel” and “Traffic Channel”). The radio units are initially assigned to this pair of predetermined signalling data channels in that the fall-back channel is “pre-programmed,” *see id.* at § 13.1, and the “number of the channel on which the radio unit will receive the fall-back service” is to be “stored in read-only memory,” *id.* at § 13.2. A person of ordinary skill in the art would have understood that the fall-back channel is predetermined and stored in read-only memory, and that it constitutes the initial assignment of a signalling data channel in fall-back mode. *See* Ex. 1002, ¶ 127.

- c. Limitation [B]: “monitoring the status of a plurality of signalling data channels in use between said central controller and said plurality of remote terminals for the usability of said signalling data channels”*

The MPT Specifications define functionality that requires monitoring the status of control channels (*i.e.*, signalling data channels) in use between the TSC

(*i.e.*, the central controller) and the radio units (*i.e.*, the plurality of radio units) for usability of those channels. Again, there are at least two modes defined by the MPT Specifications that include this feature: (1) single channel hunt sequence followed by normal operation on a control channel, and (2) fall-back mode.

i. Limitation [B], Example 1: Channel Hunt Sequence and Normal Operation on Control Channel

The radio units monitor the status of their respective control channels for the usability of those channels. MPT 1347 explains that “[r]adio units carry out error checking measurements . . . whilst receiving on the control channel.” Ex. 1007, § 9.4.4; *see also* Ex. 1006, § 9.3.4.3 (“Whilst receiving a control channel a radio unit shall monitor the codeword error rate and count the codewords received with errors . . .”). If certain conditions are satisfied, “a codeword sample error event shall be recorded by the radio unit.” *Id.* If this occurs a number of times, the radio unit must leave the control channel. *See id.* at § 9.4.1 (“[T]he radio unit shall leave the current control channel . . . when: (a) [a]fter confirmation, a codeword sample error event has been recorded in a sample of NC2 codewords (see 9.3.4.3) and codeword sample error events are recorded in each of NZ2 further successive samples of NC2 codewords.”). Indeed, MPT 1343 specifies that “during activity subsequent to control channel confirmation, the radio unit shall monitor conditions on that channel and be prepared to leave the control channel and return to the control

channel hunting procedures.” *Id.* at § 9.4.1. Thus, after communications have been established by the plurality of radio units on various control channels, those radio units monitor the status of the control channels (*i.e.*, the signalling data channels in use between the TSC and the respective radio units) for the usability of those control channels. *See* Ex. 1002, ¶ 132. The detection of errors in data received via the control channels is an indicator of the usability of the channels, as the ’883 Patent acknowledges. *See* Ex. 1002, ¶ 133; *see also* Ex. 1001 8:35-39 (describing monitoring errors as an indication of usability); *id.* at 15:13-26 (same).

ii. Limitation [B], Example 2: Fall-Back Procedures

While in fall-back mode, different radio units in different fleets may be assigned to different control channels. As discussed in MPT 1343, “all members of a fleet would be programmed with the same channel number,” and “[t]he network may operate each of these channels independently, as a set of single channel systems.” Ex. 1006, § 13.1. While in fall-back mode, the radio units may send a random access request for a simple call, or an “RQS” message. *See, e.g.*, Ex. 1006, § 13.4.1 (“ALHF invites the following types of call request[s]: RQS”); Ex. 1005, § 9 (defining an “RQS” message as a “[r]andom access request for a Simple call”). During fall-back mode operation, the radio units are also to set a timeout value, “TC” to a value “TX.” *See* Ex. 1006, § 13.4.1 (“The timeout TC shall have a value TX”). The timeout value, “TC,” is the “maximum time [a

radio unit] spends trying to achieve access,” and the radio unit will “abandon the attempt if this time-out expires.” Ex. 1005, § 7.3.8. In the case of fall-back mode operation, where TC = TX, the timeout is 180 seconds. *See* Ex. 1006 at App’x B at B.2 (specifying timing parameters); Ex. 1002, ¶ 136. As the ’883 Patent itself explains, the use of timeouts for the receipt of expected responses is an indication of usability of a channel. *See, e.g.*, Ex. 1001 at 8:6-10 (“If the expected response is not received at the central controller from the addressed terminal after the time-out period expires, the central controller assumes that either FD-x or RD-x’ channel is not usable by the addressed remote terminal.”). Therefore, by monitoring the amount of time to establish a simple call using an RQS message, and timing out if access is not timely achieved, the MPT Specifications describe monitoring the control channels (*i.e.*, the signalling data channels) for usability of those channels. *See, e.g.* Ex. 1002, ¶ 137.

d. Limitation [CJ: “determining whether one of said plurality of remote terminals needs to be reassigned to a different signalling data channel other than said predetermined signalling data channel”

In at least both of the use cases discussed above, the MPT Specifications require a determination of whether one of the radio units needs to be reassigned to a different control channel other than the predetermined control channel.

i. Limitation [C], Example 1: Channel Hunt Sequence and Normal Operation on Control Channel

As discussed above with respect to limitation [B], “the radio unit shall leave the current control channel . . . when: (a) [a]fter confirmation, a codeword sample error event has been recorded in a sample of NC2 codewords (see 9.3.4.3) and codeword sample error events are recorded in each of NZ2 further successive samples of NC2 codewords.” *See* Ex. 1006, § 9.4.1. Since the radio unit leaves the current control channel when this condition occurs, a determination has been made that the radio unit needs to be assigned to a different control channel other than the current control channel, *e.g.*, one of the pair of signalling data channels in use. *Id.*; *see also* Ex. 1002, ¶ 140. Other criteria that can cause a determination that the radio unit needs to be reassigned to a different control channel other than the predetermined control channel include (1) a time out “after a random access registration (RQR) attempt due to . . . TC being exceeded,” (2) an instruction to enter fall-back mode (*i.e.*, the receipt of an “ALHF message,”) or (3) an alternative control channel is located that may “offer greater spectral efficiency . . . or may offer a stronger signal giving improved quality of service to the user.” Ex. 1006, §§ 9.4.1, 9.3.3.7 (discussing option 3, “Background Search Sequence”). These monitored conditions also include circumstances in which the control channel has failed and is unable to carry additional signalling data, as discussed below. *See*

infra § VII.A.2.c (discussion of claim 3, limitation [B] relating to channel failure). These conditions describe instances in which a determination is made as to whether the radio unit needs to be reassigned to a different control channel other than the predetermined control channel. *See* Ex. 1002, ¶ 141.

ii. Limitation [C], Example 2: Fall-Back Procedures

When the TSC determines that it will terminate fall-back service, a determination is made that the radio units must be reassigned to a control channel other than their pre-programmed, predetermined control channel, *e.g.*, one of the signalling data channels in use during fall-back mode operation. *See* Ex. 1002, ¶ 144. MPT 1343 specifies conditions under which “the radio unit shall exit from fall-back mode, . . . and enter the control channel acquisition procedures.” Ex. 1006, § 13.5. These conditions are: (1) receipt of “[a]n applicable MOVE message;” (2) a CLEAR message meeting specified criteria is received; (3) “[a] normal operation mode Aloha message . . . is received while active on any channel,” and (4) a user initiates a change of selected network. *Id.* The first three conditions are initiated by a network determination. *See* Ex. 1002, ¶ 145. For example, a “MOVE” command is sent on the fall-back channel “if another channel becomes the normal operation mode control channel.” *See* Ex. 1006, § 13.5. A MOVE message “is transmitted on a control channel by a TSC,” and “directs selected radio units to a different control channel.” Ex. 1005, § 5.5.4.4. Therefore,

the TSC is determining that the radio unit needs to be reassigned to a different control channel other than the pre-programmed, predetermined fall-back channel. *See* Ex. 1002, ¶¶ 146-147.

Additionally, even where a radio unit does not receive a signalling message that terminates the fall-back mode, the radio units are given “an opportunity to exit from the fall-back mode if the fall-back channel quality degrades,” using the channel hunt requirements specified in section 9.4.1. *See* Ex. 1006, § 13.5. Specifically, “[w]hile in the fall-back mode on the fall-back channel, the radio unit may come within range of a normal operation mode control channel on which it could obtain a better service.” *Id.* “While in the fall-back mode and examining channels other than the fall-back channel, the radio unit shall operate the normal rules for control channel acquisition.” *Id.* The degrading of fall-back channel quality includes circumstances in which the fall-back channel is unable to carry additional signalling data. Thus, in this additional way, the radio unit is determining that the radio unit needs to be reassigned to a different control channel (*i.e.*, one with better quality) other than the pre-programmed, predetermined fall-back channel. *See* Ex. 1002, ¶ 148.

- e. *Limitation [D]: “determining whether a different and suitable signalling data channel is available other than said predetermined channel”*

In at least both of the use cases discussed above, the MPT Specifications disclose methods including determining whether a different and suitable control channel is available other than the predetermined control channel (*e.g.*, the one that is in use) under the plain and ordinary meaning this term (even if the full scope of “said predetermined channel” and “different and suitable” is not reasonably certain), as discussed in more detail below.

i. **Limitation [D], Example 1: Channel Hunt Sequence and Normal Operation on Control Channel**

There are several examples of how the MPT Specifications disclose the claimed determination step while the radio unit is operating normally. Two such examples are highlighted here.

The first example is, “[a]fter confirmation, a codeword sample error event has been recorded in a sample of NC2 codewords (see 9.3.4.3) and codeword sample error events are recorded in each of NZ2 further successive samples of NC2 codewords.” Ex. 1006, § 9.4.1. This causes the radio unit to leave the control channel and “enter the ‘preferential hunt sequence.’” *Id.* “The ‘preferential hunt sequence’ encompasses three hunt stages which are intended to ensure that the radio unit acquires a control channel which is preferred against selected criteria.”

Id. at § 9.3.3.3. Of these three hunt stages, only one is mandatory. *Id.*; *see also* Ex. 1002, ¶ 151. The mandatory hunt stage is called the “preferential area hunt stage” and “is intended to ensure that a hunting radio unit acquires, whenever possible, a control channel bearing an AREA sub-field in the SYS field which relates to a currently valid successful registration record held by the radio unit.” Ex. 1006, § 9.3.3.3; *see also id.* at § 9.3.3.3.3. The radio unit can then sample control channels identified by records in the read/write memory on the radio unit. *See id.* at § 9.3.3.3.3 (allowing the radio unit to “[s]ample before all other channels any channel numbers recorded in its read/write memory as a control channel of the selected network for registration areas for which successful registrations are recorded”). The radio unit must confirm “the channel in accordance with the procedures specified in 9.3.4” before communicating on the control channel. *Id.*; Ex. 1002, ¶ 152.

Confirming the channel requires, *inter alia*, examination of the “LAB sub-field in light of the control category held” in the radio unit’s ROM. *See* Ex. 1006, § 9.3.4.2.5; Ex. 1002, ¶ 153. The LAB sub-field defines what categories of radio unit can access a particular control channel. *See, e.g.*, Ex. 1007, § 9.3.2.3. “If the control category of the radio unit is not one of the categories permitted access by the LAB sub-field value . . . , then the radio unit shall assume that it is not

authorized to acquire the control channel under test.”⁵ Ex. 1006, § 9.3.4.2.5. The radio unit must also perform error checking, which entails monitoring “the codeword error rate and count[ing] the codewords received with errors” Ex. 1006, § 9.3.4.3. If too many errors are detected, the radio unit stores a “codeword sample error event.” *Id.*; Ex. 1002, ¶ 155. In the event that “any of the NZ1 samples of NC1 codewords has produced a codeword sample error event then the radio unit shall reject the channel” Ex. 1006, § 9.3.4.4. Comparing the value of the LAB sub-field against the control categories stored in the radio unit’s ROM determines availability of the control channel to the radio unit. *See* Ex. 1002, ¶ 154. Error rate checking on the new control channel constitutes a determination that a different control channel is suitable for use. *See* Ex. 1002, ¶ 155. The new control channel identified during the preferential area hunt sequence is different from the predetermined control channel acquired following a power-on sequence,

⁵ “Control Category” is defined as “A designation given to the *radio unit* during *network personalization* which governs that unit’s right to access to *control channels* radiated by that *network*. A radio unit shall only access a *control channel* when the value of the LAB field in the *system identity code* indicates that unit’s *control category* is permitted to use that channel.” Ex. 1006, § 3.1 (definition of “Control Category”).

e.g., one of the control channels in use between the TSC and the radio units. *See* Ex. 1002, ¶ 152.

As a second example, when a radio unit is operating in normal operation, that radio unit may perform a background search sequence. *See, e.g.*, Ex. 1006, § 9.3.3.7 (“The ‘background search sequence’ is an optional hunting sequence which is intended to allow the radio unit, while confirmed on a control channel, to gain information about alternative control channels.”); Ex. 1002, ¶ 156. “Where the ‘background search sequence’ indicates that one or more alternative control channels are available which may offer greater spectral efficiency . . . or may offer a stronger signal giving improved quality of service to the user, the radio unit leaves the current control channel and enters the control channel hunting procedures” Ex. 1006, § 9.3.3.7. Information about other control channels is gathered by “sampling.” *Id.* This sampling is used to determine whether there is a different and suitable control channel available. *See* Ex. 1002, ¶ 157. Indeed, this is one of the criteria that a radio unit may employ for leaving the predetermined control channel. *See* Ex. 1006, § 9.4.1 (“[A] radio unit may leave the current control channel . . . when: . . . [a]fter confirmation, the radio unit has identified one or more prospective control channels as a result of carrying out a ‘background search sequence.’”); *see also* Ex. 1002, ¶ 157.

ii. Limitation [D], Example 2: Fall-Back Procedures

In the use case where the fall-back channel constitutes the predetermined signalling data channel (*e.g.*, one of the control channels in use between the TSC and the radio units during fall-back operation), a determination is made as to whether there is a different suitable control channel when the radio unit comes “within range of a normal operation mode control channel on which [the radio unit] could obtain a better service.” Ex. 1006, § 13.5. Using “the normal rules for control channel acquisition” (specified in sections 9 and 10 of MPT 1343), the radio unit determines that there are different and suitable control channels available other than the fall-back channel. *Id.*; Ex. 1002, ¶ 158.

Moreover, when the radio unit is instructed to exit the fall-back mode using one of the other conditions specified in MPT § 13.5, such as a receipt of a MOVE message directing the radio unit to a specific control channel, the radio unit will enter the “single channel hunt sequence,” *see* Ex. 1006, § 9.3.3.2.2, and, if successful, the radio unit will need to confirm the new control channel in accordance with MPT 1343 § 9.3.4. *See* Ex. 1006, § 9.3.3.2.2. As discussed above in § VII.B.1.e.i, this requires a comparison of the LAB sub-field against the control category stored in the radio unit’s memory, *see, e.g.*, Ex. 1006, § 9.3.4.2.5, and then gathering of error measurements to determine whether to confirm the channel, *see id.* at §§ 9.3.4.3 & 9.3.4.4. In this way, a determination is being made that a

different control channel from the fall-back channel is available (e.g., by comparing the LAB sub-field with the control category) and suitable (e.g., evaluating errors). See Ex. 1002, ¶ 161.

f. Limitation [E]: “reassigning by said central controller said remote terminal to a different and suitable signalling data channel for communication henceforward”

Again, in both use cases outlined herein, the TSC must reassign the remote terminal to a different and suitable signalling data channel for communication henceforward. The claimed “different and suitable signalling data channel” (regardless of whether the full scope of the phrase “different and suitable” is reasonably certain), is discussed above. The registration process outlined in MPT 1343 demonstrates that the TSC reassigns the radio unit to a new control channel for further communications in both use cases.

i. Limitation [E], Example 1: Channel Hunt Sequence and Normal Operation on Control Channel

After the new control channel has been confirmed (*i.e.*, the different and suitable control channel), the radio unit then initiates a process to register with the network. Ex. 1006, § 10.2.3; Ex. 1002, ¶ 115. “Once confirmed on a control channel, the radio unit shall not transmit any message other than RQR, or any acknowledgement in response to an Ahoy . . . unless it holds a successful registration record relating to the verified AREA code” Ex. 1006, § 10.2.3.

The process for determining whether a valid registration record is available, and acquiring one if not, is described *supra*, § VII.B.1.b.i, in the context of the flow chart demonstrative.

“If the radio unit does not hold a successful registration record for the verified AREA code, the radio unit shall attempt to register by random access . . . according to normal rules” Ex. 1006, § 10.2.3. “When a radio determines that it is required to register, it shall attempt to do so by random access,” and if the registration is accepted the TSC will send a message “ACK(QUAL= ‘0’), and if the registration is not accepted the TSC will send a message “ACKX(QUAL = ‘0’)”. Ex. 1006, §§ 10.2.4.1, 10.2.4.1.1 (registration accepted) & 10.2.4.1.2 (registration denied). MPT 1327 § 8.2.1.2 describes the various registration acknowledgement message sent by the TSC and demonstrates that it is the TSC (*i.e.*, the central controller) that is making the decision on whether the radio unit will be able to continue communications “henceforward.” See Ex. 1002, ¶ 166. As a further indication of reassignment by the TSC, MPT 1343 makes it clear that the registration process “enables a network to record the likely area in which a radio unit is located.” Ex. 1006, § 10.2.1. “The principle of registration requires that the radio unit shall only retain a valid registration record where it has received confirmation that it is the same record as that currently held within the network.” *Id.* at § 10.2.1.1. A person of ordinary skill in the art reading these passages would

understand that the MPT Specifications are disclosing updating and maintenance of registration records by the TSC. *See* Ex. 1002, ¶ 167. This allows for the network to “record[] the area or group of areas where a radio unit is likely to be located within a network.” Ex. 1006, § 10.1.1. Moreover, a person of ordinary skill in the art would understand that when a new registration is granted, this constitutes a reassignment of the control channel, which allows the radio unit to be “free to transmit any message conforming to the requirements of this specification,” *see* Ex. 1006, § 10.2.3, and thus permits further communication over the newly acquired control channel henceforward, *see* Ex. 1002, ¶ 167.

ii. Limitation [E], Example 2: Fall-Back Procedures

After a new control channel is confirmed according to the procedures outlined in § 9 of MPT 1343, the radio unit cannot use the control channel until it has obtained a valid registration for that channel. This process, as outlined above, is discussed in MPT 1343, section 10. *See supra* VII.B.1.e.i. That discussion of how a registration on a control channel by messages sent by the TSC constitutes a reassignment of the control channel to the radio unit applies equally with respect to this use case. *See* Ex. 1002, ¶ 168.

Nothing in claim 1 requires limitations (a)-(d) be performed by any specific entity. Ex. 1002, ¶ 210. Where such an entity is required to perform a specific limitation, the claims so state. Ex. 1002, ¶ 210. For example, limitation 1(e)

discloses that the reassignment is required to be performed by the central controller, whereas the remaining limitations are only required to be performed “in a multiple access communication system.” Ex. 1001 at 14:27-53. Claim 2 also shows that where the claim requires action by a specific entity, it is so stated. Ex. 1001, 14:54-15:12 (claiming “polling *by said central controller* . . . “ and “sensing *by an activated remote terminal* . . . “).

2. Claim 4

- a. *Preamble: “In a multiple access communication system according to claim 1, said step of determining whether one of said plurality of remote terminals needs to be reassigned to a different signalling data channel other than said predetermined signalling data channel comprising the steps of:”*

How the MPT Specifications disclose, in various exemplary modes of operation, the step of determining whether one of said plurality of remote terminals needs to be reassigned to a different signalling data channel other than said predetermined signalling data channel has been discussed *supra* § VII.B.1.d. The MPT Specifications further disclose the steps recited in claim 4, as discussed in further detail below. Thus, the combined teachings of the MPT Specifications which were intended to be combined in deploying a standards-compliant MPT network, *see supra* § VII.A.3, render the subject matter of claim 4 obvious too.

- b. *Limitation [A]: “sensing the status of said predetermined signalling data channel which said terminal has been assigned to for overloading to determine whether said terminal needs to be reassigned to a different signalling data channel because of overloading;”*

The MPT Specifications disclose a process that includes monitoring the status of the control channels that the radio units are assigned to for overloading in order to determine whether the radio unit should be reassigned to a different control channel because of the overloading.

Specifically, after registering on a confirmed control channel, a radio unit “is free to transmit any message conforming to the requirements of” the MPT Specifications. Ex. 1006, § 10.2.3. One example of a message that may be transmitted is a short data message. *See generally* Ex. 1006, § 14. Section 14 of MPT 1343 “describes the air interface requirements necessary to support signalling between radio units and TSCs during the transfer of short data messages on the control channel.” *Id.* at § 14.1. At the outset, “[a] calling radio unit requests to transmit a short data message by sending an RQC random access request message addressed to the called unit or service.” *Id.* MPT 1327 defines certain acknowledgements that can be sent to the radio unit “to indicate progress of short data transaction[s] (as requested by an RQC message).” Ex. 1005, § 5.5.2.1 (defining “[a]cknowledgement messages sent by the TSC”). One message that a radio unit may receive in response to a RQC message is an “ACKX (QUAL=‘1’)”

message, which indicates a “[s]ystem or called unit overload; message rejected.” *Id.* (pg. 5-18).

After receiving an “ACKX (QUAL= ‘1’)” message, the “radio unit may leave the current control channel and enter the control acquisition procedures.” Ex. 1006, § 9.4.1 (“After confirmation, the radio unit receives ACKX(QUAL=‘1’) as a result of sending a random access request message, except RQR.”). A person of ordinary skill in the art would have understood from this that the overload message, ACKX(QUAL=‘1’), rejecting a request to send a message over the currently assigned control channel, followed by a change in the control channel as permitted by MPT 1343 § 9.4.1, meant that the currently assigned control channel needed to be changed due to overload. *See* Ex. 1002, ¶ 203. Since the ACKX(QUAL=‘1’) message indicates an overload condition precluding the use of the control channel to send short data messages over that control channel, and, after receiving the overload message, allows the radio unit to hunt for a new control channel, the MPT Specifications include monitoring the status of the control channels for overload. *Id.* at ¶ 204. In the alternative, a person of ordinary skill in the art would have found it obvious to include a step of sensing the status of the control channel to which the radio unit was assigned for overloading directly, since a direct measurement of channel loading against an overload threshold would

have provided a reliable and simple way to determine if an “ACKX(QUAL= ‘1’)” message should be sent due to channel overloading. *See* Ex. 1002, ¶ 205.

- c. Limitation [B]: “sensing the status of said predetermined signalling data channel which said terminal has been assigned to for failure to determine whether said terminal needs to be reassigned to a different signalling data channel because of failure.”*

The MPT Specifications disclose a process that includes sensing the status of a control channel on which a radio unit is operating for failure to determine whether the radio unit should be reassigned to a different signalling data channel. Specifically, and as discussed above, once registered on a control channel, a radio unit “is free to transmit any message conforming to the requirements of” the MPT Specifications. Ex. 1006, § 10.2.3. One example of such a message is a random access message; “[a]fter sending a random access message, a radio unit shall wait to receive a response from the TSC.” Ex. 1005, § 7.3.8. “The radio unit shall abandon its access attempt if it has sent the maximum permitted number of transmissions and received no valid response.” *Id.* The type of message dictates the number of transmission attempts. *Id.* The maximum permitted number of transmissions is defined as “NE” or “NR” and is either 8 or 16 requests, by default. *See, e.g.,* Ex. 1005, § 7.3.8 & App’x 1 (pg. A1-1). “[W]hen the radio unit has timed-out on a random access attempt due to NR or NE being reached,” the radio unit “may enter the control channel acquisition procedures.” Ex. 1006, § 9.3.1.

MPT 1343, § 9.4.1 also discloses that this is a reason that the radio unit may leave a control channel and locate a different usable control channel. *See* Ex. 1006, § 9.4.1 (“After confirmation, the radio unit has timed out after a random access attempt, except RQR, due to NR or NE being reached . . .”).

The ’883 Patent itself states that timeout due to a maximum number of transmission attempts indicates failure. *See, e.g.*, Ex. 1001 at 6:41-47 (“In case of transmission failure (detected through a number of retries without receiving acknowledgment), the central controller reverts back to FD-1 and then FD-2 for transmission to the specific remote terminal, while the remote terminals reverts back to RD-1 and then RD-2 for transmission and to FD-1 and FD-2 for reception.”). Therefore, sensing the number of maximum random access message retries on the registered control channel without receiving an acknowledgement, as described in both MPT 1327 and 1343, as well as the ’883 Patent, constitutes sensing the status of the control channel for failure. *See* Ex. 1002, ¶ 207. Moreover, the fact that the radio unit can use the time-out due to NE or NR being reached as an indication that the radio unit should leave the control channel and enter the control channel acquisition procedures, *see* Ex. 1006, § 9.4.1, shows that a person of ordinary skill in the art would have read the MPT Specifications as using the channel failure sensed to indicate that the radio unit needs to be reassigned to a different control channel, *see* Ex. 1002, ¶ 208.

Nothing in claim 4, nor in claim 1 from which claim 4 depends, requires the “sensing” or “determ[ing] where [the] terminal needs to be reassigned” to be performed by any specific entity. Ex. 1002, ¶ 210. Indeed, where such an entity is required to perform a specific limitation, the claims so state. Ex. 1002, ¶ 210. For example, limitation 1(e) discloses that the reassignment is required to be performed by the central controller, whereas the remaining limitations, including limitation 1(c) which claim 4 extends, are only required to be performed “in a multiple access communication system.” Ex. 1001 at 14:27-53. Claim 2 also shows that where the claim requires action by a specific entity, it is so stated. Ex. 1001, 14:54-15:12 (claiming “polling by said central controller . . .” and “sensing by an activated remote terminal . . .”).

C. Ground 2: Claim 3 is Invalid Under 35 U.S.C. § 103(a) As Obvious Over MPT 1343 In View of MPT 1347 and MPT 1327 as Applied to Claim 1, and Further In View of Zudnek and Dufresne

1. Claim 3

- a. *Preamble: “In a multiple access communication system according to claim 1, said step of monitoring the status of a plurality of the signalling data channels in use between said central controller and said plurality of remote terminals for the usability of said signalling data channels comprising the steps of”*

The MPT Specifications disclose the method according to claim 1, including a step of monitoring the status of a plurality of the signalling data channels in use between said central controller and said plurality of remote terminals for the

52 usability of said signalling data channels. *See supra*, § VII.B.1.c. The MPT Specifications taken in view of the Zudnek and Dufresne references disclose the method as recited in claim 3, as demonstrated below. Zudnek and Dufresne are prior art under at least § 102(b) because they issued as patents on September 26, 1989 and April 24, 1990, respectively. *See* Exs. 1008, 1009.

b. *Limitation [A]: “calculating the aggregate traffic load requirements of said plurality of signalling data channels in use;”*

The MPT Specifications teach that “[c]ommercial networks in Band III sub-bands 1 and 2 may operate with multiple control channels at a single site and may require the subdivision of the radio unit population to allow load sharing between control channels.” Ex. 1006, § 9.5.1; *see also* Ex. 1007, § 9.3.2.3 (“The network operator may wish to radiate more than one control channel at a particular site location and to sub-divide the radio-unit population to allow load sharing between these control channels.”). The ability of the network to divide the load among control channels is dictated by the LAB sub-field on the control channel. *See, e.g.*, Ex. 1006, §§ 9.5.1 & 9.5.3. The LAB sub-field is compared to the control category of a radio unit to determine whether the radio unit can access a particular control channel. *Id.* at § 9.3.4.2.5. MPT 1347 describes what happens when the LAB sub-field is changed on a control channel during operation:

A change in the LAB field value on a control channel which currently has a population of radio units will result in radio units previously 53 permitted and now denied entering the control channel acquisition procedures. The redistribution of radio units, in this instance, may be facilitated by the use of the MOVE message to redirect radio units to a particular control channel.

Ex. 1007, § 9.3.2.3. While it is clear to a person of ordinary skill in the art that the MPT Specifications disclose load sharing, to the extent that they do not disclose the precise algorithms used for load sharing, it would have been obvious to implement certain calculations and data in load sharing on the trunked radio network defined by the MPT Specifications. *See* Ex. 1002, ¶ 178. Indeed, based on the MPT Specifications explicit disclosure that “[s]ystem designers should choose a control algorithm appropriate to the type of system,” *see, e.g.*, Ex. 1005, § 7.1, a person of ordinary skill in the art would be motivated to rely on and implement prior art algorithms to implement the functionality disclosed by the MPT Specifications. *See* Ex. 1002, ¶ 182.

For example, Zudnek discloses a system where the aggregate traffic load requirements are calculated in order to perform load leveling.⁶ Zudnek explains that “should the amount of data traffic between the available data channels be

⁶ Zudnek is discussed in the background section of the ‘883 Patent. Ex. 1001 at 1:66-2:1 (discussing Zudnek in the context of “Related Art”).

unbalanced, the present invention contemplates reassigning subscriber units to the available data channels to balance the data traffic load, thereby providing superior access time and system performance.” Ex. 1008 at 2:39-44. Zudnek further explains that “[i]n addition to overall data traffic monitoring, the network controller 108 may determine that the data traffic load on a particular data channel is excessive.” *Id.* at 5:59-61. This “overall data traffic monitoring” referenced in Zudnek constitutes a calculation of the aggregate traffic load requirements, as would have been understood by a person of ordinary skill in the art. *See, e.g.*, Ex. 1002, ¶ 180.

Given the ability to reassign the LAB sub-field values and the disclosure of load sharing in the MPT Specifications, as discussed above, it would have been obvious to include a software-based process within the TSC for calculating the aggregate traffic load on the control channels in order to allow the TSC to reassign the LAB sub-fields on the control channels to allow load sharing on the control channels in use by the system. *See* Ex. 1002, ¶ 182. Such a configuration was known to those of skill in the art as evidenced by the Zudnek “network controller,” and would allow the TSC to exhibit “superior access time and system performance.” *See* Ex. 1008 at 2:43-44. Therefore, as of the filing date of the ’883 Patent, it would have been obvious to include a software-based process step of

calculating the aggregate traffic load requirements of the control channels by the TSC.

c. Limitation [B]: “monitoring the past collision count of said plurality of signalling data channels in use;”

The MPT Specifications disclose monitoring past collision counts on the control channels to allow for frame length adjustments based on collisions on the control channels. Specifically, MPT 1343 explains that while “active on a control channel . . . the radio unit shall monitor conditions on that channel.” Ex. 1006, § 9.4.1. Similarly, “[t]he TSC can monitor activity on the control channel and can optimize the system performance by varying the framelength to prevent excessive clashing and to minimize access delays.” Ex. 1005, § 1.3.3.2. “The TSC detects the clashing of requests RQS1 and RQS2, and marks a longer frame (with message ALH(2)). . . . In the absence of clashing, the framelength may be reduced.” *Id.* The word “clashing” refers to collisions.

Thus, a person of ordinary skill in the art would have understood the MPT Specifications to refer to a situation in which the TSC monitors the past collision count on each control channel, and if there are collisions detected, the TSC varies the frame length to improve system performance. *See* Ex. 1002, ¶ 184. Thus, if the past collision count is greater than some number of collisions, the frame length is increased, *see* Ex. 1002, ¶ 184, if there are no past collisions—*i.e.*, “the absence of clashing”—“the framelength may be reduced,” Ex. 1005, § 1.3.3.2.

Even if the MPT Specifications did not disclose monitoring the past collision count on the control channels, it would have been obvious to add such a functionality to the TSC to improve system performance. Specifically, Dufresne “relates to a bidirectional transmission system,” and detects at a central controller whether there have been collisions on a shared transmission channel. *See, e.g.*, Ex. 1009 at 1:5-16, 3:13-19 (“A circuit at the head end detects collisions between signals received from the subscriber stations”). Dufresne’s central controller detects whether signals are received on the upstream channel and sends a status byte indicating whether the channel is busy or idle, as well as the existence of a collision to remote terminals. *See id.* at 3:20-26. After detecting a collision, a status byte is transmitted from the central controller to the remote terminals, allowing the remote terminals to count “the number of signal collision status signals received,” and adjust system parameters based on that count. *Id.* at 3:36 51; *see also id.* at 2:25-30 (“The transmitting subscriber terminal also counts collisions”). Dufresne also teaches that the number of collisions increases with the traffic load on a channel. Ex. 1009 at 1:35-41, 2:39-43, 2:51-55.

Based on these disclosures, a person of ordinary skill in the art would have understood that the system described by the MPT Specifications would have suffered from the same problem of increased collisions with increased traffic on the control channels. *See* Ex. 1002, ¶ 190. Moreover, using a collision count

procedure like that disclosed in Dufresne would have allowed the system described by the MPT reference to vary the frame length depending on some non-zero collision count as expressly suggested by the MPT Specifications themselves. *See* Ex. 1002, ¶ 191. Such an arrangement would “optimise the system performance by varying the framelength to prevent excessive clashing and to minimize access delays.” Ex. 1005, § 1.3.3.2. Thus, including a process step of monitoring the past collision count on the control channels in the TSC software—to the extent not already present in the TSC software—would have been obvious at the time of the filing of the ’883 Patent.

d. Limitation [C]: “monitoring the transmission error count of said plurality of signalling data channels in use;”

MPT 1347 explains that “[r]adio units carry out error checking measurements . . . whilst receiving on the control channel.” Ex. 1007, § 9.4.4; *see also* Ex. 1006, § 9.3.4.3 (“Whilst receiving a control channel a radio unit shall monitor the codeword error rate and count the codewords received with errors”). If certain conditions are satisfied, “a codeword sample error event shall be recorded by the radio unit.” *Id.* If this occurs a number of times, the radio unit must leave the control channel. *See id.* at § 9.4.1 (“[T]he radio unit shall leave the current control channel . . . when: (a) [a]fter confirmation, a codeword sample error event has been recorded in a sample of NC2 codewords (see 9.3.4.3) and codeword sample error events are recorded in each of NZ2 further successive samples of

NC2 codewords.”). Indeed, MPT 1343 specifies that “during activity subsequent to control channel confirmation, the radio unit shall monitor conditions on that channel and be prepared to leave the control channel and return to the control channel hunting procedures.” *Id.* at § 9.4.1. Thus, the MPT Specifications disclose monitoring the transmission error count of the control channels (*i.e.*, the signalling data channels) that are in use between the TSC and the radio units. *See* Ex. 1002, ¶ 192.

e. Limitation [D]: “sensing the status of said plurality of signalling data channels in use for failure.”

The MPT Specifications disclose a process that includes sensing the status of a control channel on which a radio unit is operating for failure to determine whether the radio unit should be reassigned to a different signalling data channel. Specifically, and as discussed above, once registered on a control channel, a radio unit “is free to transmit any message conforming to the requirements of” the MPT Specifications. Ex. 1006, § 10.2.3. One example of such a message is a random access message; “[a]fter sending a random access message, a radio unit shall wait to receive a response from the TSC.” Ex. 1005, § 7.3.8. “The radio unit shall abandon its access attempt if it has sent the maximum permitted number of transmissions and received no valid response.” *Id.* The type of message dictates the number of transmission attempts. *Id.* The maximum permitted number of transmissions is defined as “NE” or “NR” and is either 8 or 16 requests, by default.

See, e.g., Ex. 1005, § 7.3.8 & App’x 1 (pg. A1-1). “[W]hen the radio unit has timed-out on a random access attempt due to NR or NE being reached,” the radio unit “may enter the control channel acquisition procedures.” Ex. 1006, § 9.3.1. MPT 1343, § 9.4.1 also discloses that this is a reason that the radio unit may leave a control channel and locate a different usable control channel. *See* Ex. 1006, § 9.4.1 (“After confirmation, the radio unit has timed out after a random access attempt, except RQR, due to NR or NE being reached . . .”).

The ’883 Patent itself states that a timeout due to a maximum number of transmission attempts indicates failure. *See, e.g.*, Ex. 1001 at 6:41-47 (“In case of transmission failure (detected through a number of retries without receiving acknowledgment), the central controller reverts back to FD-1 and then FD-2 for transmission to the specific remote terminal, while the remote terminals reverts back to RD-1 and then RD-2 for transmission and to FD-1 and FD-2 for reception.”). Therefore, sensing the number of maximum random access message retries on the registered control channel without receiving an acknowledgement, as described in both MPT 1327 and 1343, as well as the ’883 Patent, constitutes sensing the status of the control channel for failure. *See* Ex. 1002, ¶ 194. Moreover, the fact that the radio unit can use the time-out due to NE or NR being reached as an indication that the radio unit should leave the control channel and enter the control channel acquisition procedures, *see* Ex. 1006, § 9.4.1, shows that

a person of ordinary skill in the art would have read the MPT Specifications as using the channel failure sensed to indicate that the radio unit needs to be reassigned to a different control channel, *see* Ex. 1002, ¶ 195.

Nothing in claim 3, nor in claim 1 from which claim 3 depends, requires the any of the limitations of claim 3 to be performed by any specific entity. Ex. 1002, ¶ 210. Indeed, where such an entity is required to perform a specific limitation, the claims so state. Ex. 1002, ¶ 210. For example, limitation 1(e) discloses that the reassignment is required to be performed by the central controller, whereas the remaining limitations, including limitation 1(b) on which claim 3 extends, are only required to be performed “in a multiple access communication system.” Ex. 1001 at 14:27-53. Claim 2 also shows that where the claim requires action by a specific entity, it is so stated. Ex. 1001, 14:54-15:12 (claiming “polling *by said central controller . . .*” and “sensing *by an activated remote terminal . . .*”).

VIII. CONCLUSION

For the foregoing reasons, *inter partes* review, and ultimately cancellation of claims 1, 3, and 4 of the ’883 Patent is respectfully requested.

Respectfully submitted,

Dated: August 24, 2015

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§ 42.6(e)—CERTIFICATION OF SERVICE

In accordance with § 42.6(e)(1), the undersigned certifies that on the 24th day of August 2015, the above *Petition for Inter Partes Review of U.S. Patent No. 5,563,883* and the following exhibits:

Cox Ex. No.	Brief Description
1001	U.S. Patent No. 5,563,883 to Cheng
1002	Declaration of Stuart Lipoff
1003	<i>Curriculum Vitae</i> of Stuart Lipoff
1004	<i>Claim Construction Memorandum and Order</i> from <i>C-Cation Techs., LLC v. Comcast Corp., et. al.</i> , 2:11-CV-30-JRG-RSP, Dkt. 222 (Jul. 3, 2013)
1005	MPT 1327: <i>A Signalling Standard for Trunked Private Land Mobile Radio Systems</i> (Revised and reprinted November 1991) (“MPT 1327”)
1006	MPT 1343: <i>Performance Specification; System Interface Specification for radio units to be used with commercial trunked networks operating in Band III sub-bands 1 and 2</i> (Revised and Reprinted September 1991) (“MPT 1343”)
1007	MPT 1347: <i>Radio interface specification; For commercial trunked networks operating in Band III, sub-bands 1 and 2</i> (Revised and Reprinted September 1991) (“MPT 1347”)
1008	U.S. Patent No. 4,870,408 to Zudnek
1009	U.S. Patent No. 4,920,533 to Dufresne <i>et al.</i>
1010	Radiocommunications Agency: 91-92 Annual Report
1011	William Stallings, <i>LOCAL AND METROPOLITAN AREA NETWORKS</i> (4th Ed. MacMillan Publishing Co. (1993))
1012	John Graham, <i>The Facts on File Dictionary of Telecommunications</i> (1983)
1013	C-Cation Technologies, LLC’s Opening Claim Construction Brief in <i>C-Cation Techs., LLC v. Comcast Corp., et al.</i> , No. 2:11-cv-00030-JRG-RSP, Dkt. 187 (filed Mar. 22, 2013)
1014	Robert I. Desourdis, Jr., <i>et al.</i> , <i>EMERGING PUBLIC SAFETY WIRELESS COMMUNICATIONS SYSTEMS</i> (Artech House, 2001) (excerpts)

Cox Ex. No.	Brief Description
1015	Radiocommunications Agency Home Page (last visited 1/28/2015)
1016	U.S. Patent No. 5,117,501 to Childress et al.
1017	Thomas Farrell, " <i>A Computer Simulation Analysis of Convention and Trunked Land Mobile Radio Systems at Wright Patterson Air Force Base</i> " (Jan. 19, 1989)
1018	International Application Publication No. WO 93/16566 (Aug. 19, 1993)
1019	International Application Publication No. WO 93/16530 (Aug. 19, 1993)

were served on the patent owner at the correspondence address of record for the subject patent,

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