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Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380

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ORDER

Adopted: January 26, 2011 **Released: January 26, 2011**

Amended Proposals Date: February 28, 2011
Initial Workshop Date: March 10, 2011

By the Chief, Office of Engineering and Technology:

I. INTRODUCTION

1. In this Order we conditionally designate nine entities—Comsearch, Frequency Finder Inc., Google Inc., KB Enterprises LLC and LS Telcom, Key Bridge Global LLC, Neustar Inc., Spectrum Bridge Inc., Telcordia Technologies, and WSdb LLC—as TV bands device database administrators, subject to conditions described herein. The TV bands databases will be used by fixed and personal portable unlicensed devices to identify unused channels that are available at their geographic locations. This action will allow the designated administrators to develop the databases that are necessary to enable the introduction of this new class of broadband wireless devices in the TV spectrum.

II. BACKGROUND

2. On September 23, 2010, the Commission adopted a *Second Memorandum Opinion and Order* (*Second MO&O*) in ET Docket No. 04-186 that updated the rules for unlicensed wireless devices that can operate in broadcast television spectrum at locations where that spectrum is unused by licensed services.[1] This unused TV spectrum is commonly referred to as television "white spaces." The rules allow for the use of unlicensed TV bands devices in the unused spectrum to provide broadband data and other services for consumers and businesses.

3. To prevent interference to authorized users of the TV bands, TV bands devices must include a geo-location capability and the capability to access a database that identifies incumbent users entitled to interference protection, including, for example, full power and low power TV stations, broadcast auxiliary point-to-point facilities, PLMRS/CMRS operations on channels 14-20, and the Offshore Radiotelephone Service.[2] The database will tell a TV band device which TV channels are vacant and can

[1] *See Second Memorandum Opinion and Order* in ET Docket No. 04-186, FCC 10-174, adopted September 23, 2010. An *Erratum* correcting certain text and amendments to the rules in the *Second Memorandum Opinion and Order* was released by the Commission's Office of Engineering and Technology on October 19, 2010.

[2] *See* 47 C.F.R. § 15.711. The rules also contain provisions for devices that rely on spectrum sensing to determine available channels. *See* 47 C.F.R. § 15.717.

be used at its location.[3] The database also will be used to register the locations of fixed TV band devices and protected locations and channels of incumbent services that are not recorded in Commission databases.[4] The rules state that the Commission will designate one or more entities to administer a TV bands database.[5]

4. The Office of Engineering and Technology (OET) released a public notice on November 25, 2009 inviting entities interested in being designated as a TV bands database administrator to file proposals with the Commission and inviting comments on the proposals.[6] The notice requested that entities address how the basic components of a TV band database(s) as required by the Commission's rules would be satisfied—*i.e.*, a data repository, a data registration process, and a query process—and whether the entity sought to provide all or only some of these functions and affirm that the database service will comply with all of the applicable rules. In particular, interested parties were requested to show: 1) the entity's technical expertise to administer a TV band database and its business plan to operate it for a five-year term, 2) the scope of the database functions the entity intends to perform and how it would synchronize data between multiple databases, 3) diagrams of the architecture of the database system and a detailed description of how each function operates and interacts with the other functions, 4) information on any other entities performing database functions and the business relationship between itself and these other entities, and 5) the methods that will be used by TV bands devices to communicate with the database, the procedures that it plans to use to verify that a device can properly communicate with the database, and the security methods that will be used to ensure that unauthorized parties can not access or alter the database.

5. We received proposals from nine parties in response to this notice: Comsearch, Frequency Finder Inc., Google Inc., KB Enterprises LLC and LS Telcom, Key Bridge Global LLC, Neustar Inc., Spectrum Bridge Inc., Telcordia Technologies, and WSdb LLC. Fifteen parties filed comments in response to the notice and eight parties filed reply comments. A list of parties filing comments is in Appendix A.

6. Subsequent to the notice inviting proposals from prospective database administrators, the Commission adopted the *Second MO&O,* which generally upheld the Commission's prior decisions on the TV bands device rules. The *Second MO&O* upheld the Commission's decision to designate multiple database administrators, deciding that it would rely on market forces to shape the structure of the database administration functions and service offerings, subject to the various requirements set forth in the rules.[7] The Commission also decided that, once OET selects the database administrator(s), it will be

[3] *See* 47 C.F.R. § 15.713(a)-(b).

[4] *Id.* (*e.g.*, the locations of cable headends and low power TV receive sites that are outside the protected contours of the TV stations whose signals they receive; the locations where authorized wireless microphones and other low power auxiliary devices are used on a regular or scheduled basis).

[5] *See* 47 C.F.R. § 15.715.

[6] *See* "Office of Engineering and Technology Invites Proposals from Entities Seeking to be Designated TV Band Device Database Managers," Public Notice, DA 09-2479, ET Docket No. 04-186, rel. Nov. 25, 2009. The information requested in the Public Notice was based on rules for TV bands databases and administrators adopted in the *Second Report and Order and Memorandum Opinion and Order (Second Report and Order)* in ET Docket No. 04-186, 23 FCC Rcd 16807 (2008).

[7] *See* Second MO&O at para. 104.

responsible for oversight and management of the database administrators(s) and their functions.[8] The *Second MO&O* also made certain changes to the rules with respect the TV bands database. Specifically, it required that communications between TV bands devices, TV bands databases and between multiple databases be secure.[9] The Commission did not require the use of specific technologies to meet these requirements. In addition, the Commission required that all information that the rules require to be in a TV bands database be made publicly available.[10]

III. DISCUSSION

7. Based upon our review of the proposals and the record before us, we are designating multiple TV bands database administrators, subject to conditions described below. Specifically, we are conditionally designating each of the applicants – Comsearch, Frequency Finder Inc., Google Inc., KB Enterprises LLC and LS Telcom, Key Bridge Global LLC, Neustar Inc., Spectrum Bridge Inc., Telcordia Technologies, and WSdb LLC – as TV bands database administrators. While the operation of multiple database administrators may present some coordination challenges, we find it is in the public interest to have multiple parties developing business models for this new mechanism. The value of this exercise extends beyond databases for the TV bands, as the Commission is also considering employing similar database approaches in other spectrum bands.

8. We employ conditions on our database administrator designations for several reasons. First, the Commission modified some of the requirements for the databases and administrators in the *Second MO&O*, some time after the database administrator proposals were submitted. Accordingly, we are designating these nine entities as database administrators only on a conditional basis, subject to the requirement, *inter alia*, that each administrator supplement its previous filings with sufficient detailed information to demonstrate how it will comply with the rule changes adopted in the *Second MO&O*. Moreover, while we conclude that each of the applicants has an acceptable degree of technical expertise to administer a database, as well as a viable business plan for operating it for at least five years, we recognize that this threshold is but the minimum for providing the required services. Employing a more exacting set of qualification requirements, however, would greatly expand the timeframe for selection and reduce opportunities for participation and the potential competition for the subject services. To balance these interests, we therefore require each database administrator to coordinate closely with the agency to ensure competency, consistency and compliance with the rules and the database trials.

9. Second, we have determined that the development and implementation of a well functioning system for employing white spaces devices will require significant database oversight and testing.[11] Accordingly, OET will conduct a series of mandatory workshops with the database administrators to address implementation issues and to ensure consistency and compliance with the rules, as described in more detail below. As part of this oversight, OET will identify the tasks that each administrator will have to perform to show compliance with the rules, instruct the administrators on how to implement certain features to ensure compliance, and establish milestone dates for each administrator to submit reports of its progress or otherwise demonstrate compliance. We also will require real-world testing of databases to

[8] *Id.*at para. 107. *See also* 47 C.F.R. § 0.241 (OET is delegated authority, for example, to develop methods to designate TV bands database administrators, to designate administrators, and to develop procedures that the administrators will use to ensure compliance with the rules).

[9] *See* 47 C.F.R. § 15.713(j) as amended by the *Second MO&O*.

[10] *See* 47 C.F.R. § 15.715(i).

[11] *See* MSTV/NAB comments at 17, NCTA comments at 8 and WSdb reply comments at 2.

ensure that they provide accurate results before they can be made generally available for use by TV bands devices.

10. In the *Public Notice*, we asked database administrator proponents to provide information adequate to show that they possess sufficient technical expertise to administer a database, and a viable business plan for operating such a database for five years.[12] Based on the information filed by the conditionally designated administrators, we find that each of them has shown that they have the technical expertise to develop and operate a TV bands database. Moreover, as explained further below, none of the concerns raised by any of the commenters in the record before us cause us to question our conclusion that these applicants are capable of meeting all the requirements placed on database administrators by the Commission's rules in the *Second Report and Order* and as modified in the *Second MO&O*. Many of the issues raised by commenters were not related to the qualifications of any database administrator applicant. Instead, those commenters raised issues concerning the requirements that should be applied to the databases and administrators.[13] Those issues were addressed in the *Second MO&O*, and therefore need not be revisited here.[14]

11. Several commenters contend that certain proposals are incomplete or deficient.[15] We disagree. Our review of the database applications before us reveals that each application includes all the information specified in the 2009 public notice, and that each applicant is capable of fulfilling all

[12] *Public Notice* at 2.

[13] For example, many comments addressed the issue of whether there should be a single or multiple database administrators. *See* Micronet Communication comments at 1, IEEE 802.18 comments at 2, Neustar comments at 2, Atheros Communications *et. al.* comments at 2, CWMU comments at 2, Nokia comments at 5, WSdb comments at 2, Key Bridge comments at 2, PISC comments at 4 and Shure comments at 7. A number of comments addressed the need for database operators to incorporate security measures. *See* IEEE 802.18 comments at 2, Atheros Communications *et. al.* comments at 4, MSTV/NAB comments at 15, Nokia comments at 6, and Shure comments at 6. Other comments addressed the need for the database to verify a TV band device's certification (MSTV/NAB comments at 11 and Shure comments at 5) and the fees that administrators may charge (EIBASS comments at 1, Nokia comments at 4 and PISC comments at 18).

[14] In the *Second MO&O*, the Commission upheld its previous decision to allow multiple database administrators and stated that it will rely on market forces to shape the structure of the database administration functions and service offerings. *See Second MO&O* at ¶ 104. The Commission also required that database administrators incorporate reasonable and reliable security measures, including verification that a device querying the database has been certified. *See Second MO&O* at ¶ 97-98. The Commission declined to establish a particular fee structure for database administrators, and modified the rules to eliminate fees for registration of fixed broadcast auxiliary service links. *See Second MO&O* at ¶ 123.

[15] Key Bridge Global states that the proposals of Google, Neustar and Comsearch are "particularly weak." *See* Key Bridge comments at 8. MSTV/NAB argues that all of the proposals fail to fully demonstrate compliance with all of the requirements contained in the Commission's rules and provide all of the information requested in the Public Notice. Specifically, it argues that KB Enterprise/LS Telcom do not demonstrate that they have a viable business plan to operate a database for the required five-year term, Frequency Finder does not fully describe the methods that will be used by TV bands devices to communicate with the database, Google fails to describe in detail how each database function will operate, Neustar does not describe whether and how security methods will be used to verify that Mode I devices are certified, Spectrum Bridge does not specify whether it will make its services available to all users on a non-discriminatory basis, and that several aspects of the proposals submitted by Telcordia, Frequency Finder and KB Enterprise/LS Telcom are so vague or generic in nature that it is difficult to determine what is being proposed. *See* MSTV/NAB comments at 6-8.

database administrator obligations. We recognize that in some cases the information provided was not particularly detailed, but all applicants addressed all of the questions in the public notice. Further, as noted above, we are designating the database administrators subject to a number of conditions, including that they attend workshops to be conducted by OET and perform real-world testing of their databases to ensure they provide accurate results before they are made available for use by TV bands devices. Thus, our designations are not based solely on the comprehensiveness of the information submitted in the proposals, but also on the ability of the designated administrators to demonstrate that they can construct a working database that complies with all of the requirements in the rules. We therefore decline to reject any of the database administrator applications before us on the basis of alleged deficiencies in the submitted documentation.

12. Key Bridge asserts that Neustar and Google are not neutral or disinterested parties and therefore should not be authorized to administer TV bands databases.[16] It argues that Neustar's business arrangements with Shared Spectrum Corporation, a developer of spectrum sensing and other cognitive radio technologies, demonstrate that it is not a neutral party. It further contends that Google is a prospective manufacturer of TV band devices, and as a database administrator it would be able to collect information such as the make, model, serial number, location and ownership of competitors' equipment. We are not persuaded by Key Bridge's assertions. It is unclear why Neustar's business arrangements with Shared Spectrum Corporation should be a concern, and in any case we note that the *Second MO&O* eliminated the requirement for TV bands devices with database access to incorporate spectrum sensing technology.[17] As for Google, while it is true that the company would be collecting certain information about competitors' products, the same basic concern applies to all other database administrators as they could make that same information available to manufacturers of TV bands devices. To address this industry-wide concern, we prohibit all database administrators from using the information collected to engage in anti-competitive practices, either by using the information themselves or providing it to third parties. We will oversee the continued database developmental work to ensure that all database administrators comply with requirements in the rules to make service available to all TV bands device users on a non-discriminatory basis.[18]

13. The Coalition of Wireless Microphone Users identifies four proposals where it has a specific issue of concern.[19] Specifically, it is concerned that: 1) Comsearch would make decisions on which entities are eligible to register wireless microphones in the database, 2) Google would not register all types of protected entities specified in the rules, 3) Neustar would require at least a 48 hour lead time for registering wireless microphones, and 4) Telcordia would provide poorer service for TV band device users that do not pay an additional fee, resulting in a higher potential for interference to authorized users of the TV bands. These are implementation concerns that can be addressed by OET in its oversight and management of the database administrators.

14. Finally, some parties question that one or more of the database administrator applicants may not comply with all of the Commission's rules. Those assertions are speculative, and so do not provide a basis for concluding that any applicant is incapable of administering a white spaces database. Furthermore, we will oversee all the database administrators, and we specifically condition each

[16] *See* Key Bridge comments at 6-7.

[17] *See Second MO&O* at ¶ 54,

[18] *See* 47 C.F.R. § 15.715(g) [previously 15.715(f)].

[19] *See* CWMU comments at 3-4.

administrator's designation on meeting all its obligations described herein. Thus, failure of an administrator to meet any one of these obligations will constitute grounds for suspending or terminating that administrator's database authority. Similarly, failure of a database administrator to meet any of the requirements set forth in the Commission's rules will subject the administrator to all appropriate enforcement action, including the possibility of sanctions and termination of the administrator designation.

15. We intend to exercise strong oversight of the TV bands databases and administrators. All database administrators must attend workshops at which OET will instruct them on how to comply with the database rules, identify tasks that must be completed by each administrator, and establish milestone dates for reporting progress on or completion of the identified tasks. Each database administrator will designate a responsible party from its organization who will attend the workshops and ensure that the organization complies with all of the conditions below.[20] The workshops will be conducted by OET's Laboratory Division. OET will address all implementation details after collecting information from the database administrators in these workshops, and also will provide guidance on the requirements to the database administrators on an as needed basis. The database administrators may decide on their own to meet separately to discuss the various tasks and may include other interested parties in their meetings; however, OET will make final decisions on issues affecting the databases and their operation and all decisions will be publicly available. OET will establish a webpage to post information about and may seek comment on the guidance that it will provide to the administrators. Each database administrator must cooperate with any steps OET deems necessary to ensure that the TV bands databases provide accurate and consistent lists of protected services and available channels. Further, they must support capabilities that OET deems necessary to ensure that any changes in registration of protected facilities in one database are rapidly reflected in all others.

16. The workshops will be a valuable tool for ensuring that each administrator understands the rules and effectively implements them. For example, while the rules do not specify the particular security methods that must be used, the Commission recognizes that security is critically important. Each database manager will be required to demonstrate that it is using robust security features and has established methods to remedy any security threats or breaches. Final approval of the security methods will be made by OET, working in consultation with the FCC Chief Technologist and Chief of the Public Safety and Homeland Security Bureau. OET may draw on other expertise as may be necessary to fully evaluate proposed security methods.

17. Finally, each database will be subject to a trial period of not less than 45 days before it is allowed to be made available for actual use by TV bands devices to allow interested parties an opportunity to check that the database is providing accurate results. A longer trial period may be required if the Commission determines that a database is not in compliance with the Commission's rules. OET will determine the details of each trial, balancing the need to ensure that the database is working properly with the need to avoid an unnecessarily cumbersome and burdensome process.

18. Database administrators that successfully satisfy all of the conditions herein will be allowed to make their databases available for actual use for the five year term specified in our rules.[21] OET will

[20] We recognize that some of the administrators intend to use subcontractors for various database functions. It is not our intent to interfere with these private arrangements; however, the administrator will need to be ultimately responsible for the activities of the subcontractor and for ensuring that the subcontractor complies with our rules. The responsible party named by the administrator will be a single point of contact for Commission staff.

[21] *See* 47 C.F.R. §15.715(h) as revised by the *Second MO&O*.

announce the public availability of each database, at which time the five year term for that database will commence.

19. In summary, we have considered the database administrator proposals and all the comments and replies filed in response to the 2009 Public Notice. We conclude that all of the database administrator applicants before us are capable of meeting the Commission's regulatory requirements for serving as database administrators, as set forth in the Commission's rules (including the rule revisions adopted in the *Second MO&O*). Accordingly, we are designating Comsearch, Frequency Finder Inc., Google Inc., KB Enterprises LLC and LS Telcom, Key Bridge Global LLC, Neustar Inc., Spectrum Bridge Inc., Telcordia Technologies, and WSdb LLC as TV bands database administrators subject to the conditions described below.

1. Each of the designated database administrators must supplement its previous filings with sufficient detailed information to indicate how it will comply with the rule changes adopted in the *Second MO&O*. Amendments to proposals must be received by February 28, 2011. Any of the database administrators that filed separate proposals and now wish to consolidate their operations must submit an updated proposal by this same date. Any database administrators that wish to withdraw their proposals must notify the Commission by this same date.
2. All database administrators must attend workshops to be conducted by OET to address the operation of the databases to ensure consistency and compliance with the rules and the database trials, as described herein. Each administrator shall designate a responsible party who will represent its organization at the workshops and also ensure compliance with all of the conditions herein by February 28, 2011. The first workshop is scheduled for March 10, 2011 at the Commission's Laboratory in Columbia, Maryland.
3. Each database administrator must cooperate with any steps OET deems necessary to ensure compliance with the rules, including for example security features.
4. Database administrators must agree that they will not use their capacity as a database manager to engage in any discriminatory or anti-competitive practices or any practices that may compromise the privacy of users.

IV. PROCEDURAL MATTERS

A. Filing instructions

20. The TV bands database is the subject of a docketed proceeding, **ET Docket No. 04-186**, and responses to this Order may be filed using the FCC's Electronic Comment Filing System (ECFS) as described below. A simplified interface for ECFS has been implemented to facilitate consumer comment. Documents filed on ECFS may be accessed and reviewed on that system, which contain copies of written submissions and summaries of oral submissions regarding the white spaces proceeding.

21. Parties must file responses with the Commission on or before the date indicated on the first page of this document. All such filings should refer to **ET Docket No. 04-186**. Proposals may be filed using: (1) the Commission's Electronic Comment Filing System ("ECFS"), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies. *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://fjallfoss.fcc.gov/ecfs2/ or the Federal eRulemaking Portal: http://www.regulations.gov.

- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

  Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

  - All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. Parties should also send a copy of their filings to Hugh L. VanTuyl, Office of Engineering and Technology, Federal Communications Commission, Room 7-A162, 445 12th Street, SW, Washington, DC 20554, or by e-mail to Hugh.VanTuyl@fcc.gov. Parties must also serve one copy with the Commission's copy contractor, Best Copy and Printing, Inc. (BCPI), Portals II, 12th Street, SW, Room CY-B402, Washington, DC 20554, (202) 488-5300, or vial e-mail to fcc@bcpi.com.

  - Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

  - U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

22. Documents in **ET Docket No. 04-186** are available for public inspection and copying during business hours at the FCC Reference Information Center, Portals II, 445 12th Street, S.W., Room CY-A257, Washington, D.C. 20554. The documents may also be purchased from BCPI, telephone (202) 488-5300, facsimile (202) 488-5563, TTY (202) 488-5562, e-mail fcc@bcpiweb.com.

23. People with Disabilities: To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

B. Contact Persons

24. For additional information concerning this Order, please contact Mr. Hugh L. Van Tuyl at (202) 418-7506 or Mr. Alan Stillwell at (202) 418-2925, or via the Internet at Hugh.VanTuyl@fcc.gov or Alan.Stillwell@fcc.gov.

V. ORDERING CLAUSES

25. Accordingly, **IT IS ORDERED** that, pursuant to the authority contained in Sections 4(i), 302, 303(e), 303(f), and 307 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 302, 303(c), 303(f), and 307, and Sections 0.31 and 0.241 of the Commission's rules, 47 C.F.R. §§ 0.31, 0.241, Comsearch, Frequency Finder Inc., Google Inc., KB Enterprises LLC and LS Telcom, Key Bridge Global LLC, Neustar Inc., Spectrum Bridge Inc., Telcordia Technologies and WSdb LLC **ARE**

CONDITIONALLY DESIGNATED as TV bands database administrators as set forth in Section 15.715 of the Commission's rules, 47 C.F.R. § 15.715, subject to the conditions specified above.

FEDERAL COMMUNICATIONS COMMISSION

Julius P. Knapp
Chief, Office of Engineering and Technology

APPENDIX A

Parties Filing Comments

Comments

1. Micronet Communications, Inc. (listed as Charles Youngblood)
2. IEEE 802.18 (listed as Michael Lynch)
3. Cavell, Mertz & Associates, Inc. (listed as Robert J. Clinton)
4. NeuStar, Inc.
5. Atheros Communications, Inc., Broadcom Corp., Dell Inc., Hewlett-Packard Co., Marvell Semiconductor, Inc., Microsoft Corp., Motorola, Inc., Nokia Inc., Philips Electronics North America Corp., and the Wireless Internet Service Providers Association
6. The Coalition of Wireless Microphone Users
7. Engineers for the Integrity of Broadcast Auxiliary Services Spectrum (EIBASS)
8. WSdb LLC, Frequency Finder, Inc., KB Enterprises LLC, Key Bridge Global, Spectrum Bridge, Telcordia Technologies
9. MSTV and NAB
10. Nokia, Inc.
11. The National Cable & Telecommunications Association (NCTA)
12. WSdb, LLC
13. Key Bridge Global, LLC
14. Public Interest Spectrum Coalition
15. Shure Incorporated

Reply comments

1. MSTV and NAB
2. Spectrum Bridge, Inc.
3. Comsearch
4. Google, Inc.
5. NeuStar, Inc.
6. Shure Incorporated
7. Telcordia Technologies, Inc.
8. WSdb, LLC