

USA TV WHITE SPACE DATABASE

Testing Report

Version 1.0, 2018-07-27





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1. Overview

1.1. About TVWS

TV white space (TVWS) is the name given to parts of the wireless spectrum that were freed up during the digital TV switchover. Using Dynamic Spectrum Management (DSM) to manage the usage of the spectrum, TVWS radios offer broadband speeds over several kilometers and the signal can travel through permanent obstacles such as buildings and trees, as well as around terrain.

TVWS is free for anyone to use and build their own network. Given the appealing characteristics of TVWS it is well suited for a range of uses, including providing broadband connectivity to rural communities, delivering wireless connectivity across campuses, and connecting IoT devices.

1.2. About Nominet

Nominet protects, promotes and supports the online presence of more than 11 million domain names and handle around 3 billion DNS requests each day. With 20 years' experience in running one of the busiest and most successful internet registries in the world, Nominet is one of the leading authorities on DNS and works closely with Internet Corporation of Assigned Names and Numbers (ICANN), the Internet Engineering Task Force (IETF) and law enforcement.

Nominet Emerging Technology utilizes its world-leading expertise to provide internet registry services in other areas of technology, such as DSM and TVWS. Nominet has operated commercially a TVWS database in the UK since January 2016.

1.3. About Nominet's TVWS Platform

Nominet's TV White Space (TVWS) Platform is a production-grade modular cloud-based system designed to answer the needs of national country regulators and network operators. It is purposely designed to accommodate multiple regulatory frameworks and jurisdictions.

The platform uses the same interface for communicating with devices across any jurisdiction globally, and is developed in tight integration with radio manufacturers.

1.4. About Nominet's USA WSDB

Nominet has developed a White Space Database (WSDB) for the USA jurisdiction, and proposed that FCC designate Nominet as a WSDB Administrator. This document constitutes a formal part of the qualification process, describing the feedback received from FCC OET and from the 45-day public testing period, and actions taken by Nominet in response.

1.5. Application Timeline

Table 1. Timeline of Nominet's USA TVWS Application and Qualification

Date	Event	URL
16 November 2017	Nominet submit "PROPOSAL BY NOMINET UK TO SERVE AS A WHITE SPACES DATABASE ADMINISTRATOR"	https://www.fcc.gov/ecfs/filing/111609559633
9 April 2018	FCC publish notice "OFFICE OF ENGINEERING AND TECHNOLOGY SEEKS COMMENT ON NOMINET UK PROPOSAL TO BE DESIGNATED AS A WHITE SPACE DATABASE ADMINISTRATOR"	https://www.fcc.gov/ecfs/filing/111609559633
4 May 2018	Nominet submit testing documentation to FCC OET and request that preliminary testing commence	
11 June 2018	FCC publish notice "Office of Engineering and Technology Announces the Opening of Public Testing for Nominet White Space Database System"	https://ecfsapi.fcc.gov/file/06111375211188/DA-18-608A1.pdf
11 June 2018	FCC publish order conditionally designating Nominet as a white space database administrator	https://ecfsapi.fcc.gov/file/0611229427453/DA-18-605A1.pdf
26 July 2018	Scheduled end of 45-day public testing	
27 July 2018	Nominet submit this report	

2. Preliminary Testing by FCC OET

Table 2. Resolution of issues raised by FCC OET during preliminary testing

Issue	Date raised	Description (OET)	Description (Nominet)	Date of resolution
F01	17 May 2018	Cannot enter longitude below -120 degrees	Accepted as minor bug; trivial validation error in web form only, underlying code unaffected	Fix deployed 18 May 2018
F02	17 May 2018	Suggest DMS longitude to not require minus sign to denote west	Accepted as minor feature request for web form .	Upgrade deployed 18 May 2018
F03a	17 May 2018	After we register protected entities, is there a way to modify and delete registrations?		
F03b	17 May 2018	We should probably consider adding a password to the protected entity registration screens.		
F03c	25 May 2018	Confirmation password & edit not a firm requirement		
F04	24 May 2018	Max. EIRP in channel 37 is 4W not 40mW	Accepted as minor bug; incorrect constant in algorithm	Fix deployed 25 May 2018

F05a	24 May 2018	Virginia location has no UHF channels available		
F05b	24 May 2018	Virginia location should have adjacent-channel availability at 40mW for portable devices and fixed device not below 10m AGL	Accepted as minor bug in algorithm	Fix deployed 30 May 2018
F06	24 May 2018	Channel search gives incorrect error when HAAT >250m	Accepted as minor bug; correct error not being propagated from API into web form.	Fix deployed 25 May 2018
F07	24 May 2018	Entered wireless mic, not immediately visible in csv	Rejected as documented behaviour; csv's updated hourly	
F08	24 May 2018	Non-continental USA locations not supported	Accepted as known issue; Maritime & non-continental locations described in testing document as not yet supported, algorithm work ongoing.	Upgrade deployed 25 May 2018

3. Public testing during 45-day period

Table 3. Resolution of issues raised by during public testing

Issue	Date raised	Description (Responder)	Description (Nominet)	Date of resolution
P01	13 July 2018	Channel Search form returns 500 error for location near Canada border	Accepted as minor bug; a small number of Canadian TV contours are multipolygons due to only just overlapping concave parts of the border, and were not properly handled in algorithm (see figure).	Fix deployed 16 July 2018
P02	17 July 2018	No devices registered in the MVPD or Fixed White Space Device databases.	Rejected; responder's testing may have predated our upgrade to begin consuming data from Google's database, which does indeed include MVPD and FWSD records. Nevertheless, switched from consuming from Google's 'sandbox' to their 'production', which has a larger dataset.	Reconfigured 18 July 2018
P03	17 July 2018	Unable to register a Fixed WSD	Rejected as expected behaviour. As per § 15.714(a) we charge a fee for the registration of Fixed White Space Devices. The process that we established under § 15.715(c) is therefore provided only to our authenticated users and is not part of the public test. Updated documentation on test site to clarify.	Clarification added 18 July 2018

P04	17 July 2018	Unable to register an MVPD due to "Request failed with status code 500."	Duplicate of P01	Fix deployed 16 July 2018
P05	17 July 2018	9 Permanent BAS links in database, expected >100	Accepted as bug in data import ; only records with 'TT' radio service codes were included, should also include 'TI', 'TP', 'TB', and 'TS'. Rectifying gave 179 PBAS records.	Fix deployed 18 July 2018
P06a	17 July 2018	It appears that your database is not being updated to reflect the "repacked" channels of TV stations.	Requested example callsign	
P06b	20 July 2018	WKAR-TV, East Lansing, Michigan is listed by Nominet as operating (and being protected) on Channel 40, while that station moved to Channel 33 in early June. See LMS File No. 54990.	Duplicate of P08	Upgraded to LMS import 25 July 2018
P07	19 July 2018	OET: Map tool incorrectly parses input latitudes west of -90	Accepted as minor bug in map tool .	Fix deployed 25 July 2018
P08	19 July 2018	OET: Requesting confirmation of source of TV data	Accepted as ongoing issue with data import ; as previously agreed with OET, data is consumed from CDBS, with work ongoing to migrate to LMS.	Upgraded to LMS import 25 July 2018

P09	25 July 2018	OET: [response to Nominet query] DRT records are separate entities from DTS records with the same callsign and sequence ID	Accepted as minor issue with data import	Fix deployed 27 July 2018
P10	25 July 2018	OET: [response to Nominet query] Construction Permit filings and DTX records are not relevant to WSDBs	Accepted as minor issue with data import	Fix deployed 27 July 2018

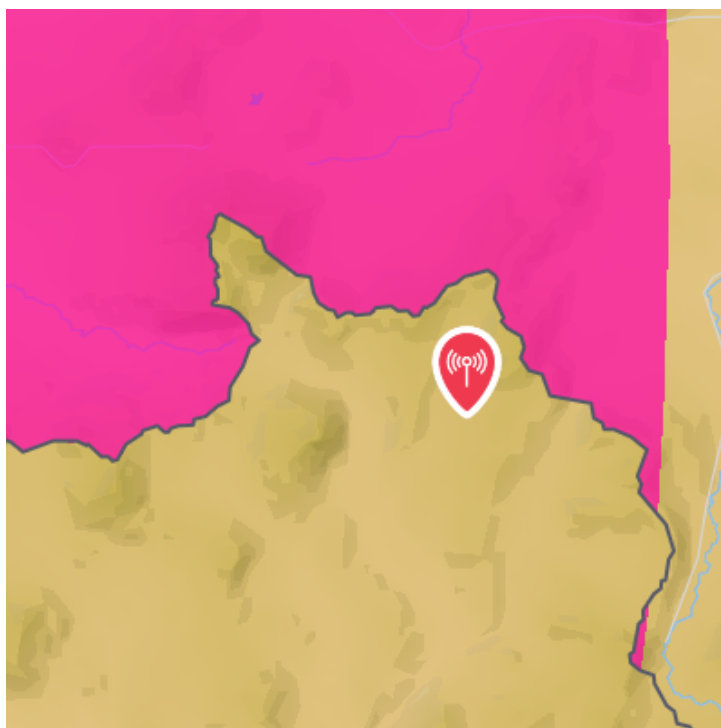


Figure 1. Protected contour of CHLT-DT~OP (in pink) as clipped to Canada side of border, with small non-contiguous 'island' to the south-east (Issue P01)

3.1. Additional Information

On 12 July 2018 an upgrade incorporating the database-to-database data synchronization module was added to the test WSDB.

4. Current Disposition

As at 27 July 2018, all issues raised during the 45-day public testing period have been resolved. Further details of any changes made can be provided on request to tvws@nominet.uk.

ABOUT NOMINET

We protect, promote and support the online presence of more than 11 million domain names and handle around 3 billion DNS requests each day. With 20 years' experience in running one of the busiest and most successful internet registries in the world, Nominet is one of the leading authorities on DNS. We work closely with Internet Corporation of Assigned Names and Numbers (ICANN) and the Internet Engineering Task Force (IETF) and law enforcement.

Nominet is also part of the Active Cyber Defence (ACD) programme, being run as part of UK Government's National Cyber Security Strategy to help protect governmental and Public Service Networks (PSNs) from malware, phishing, botnets and other threats.

About Nominet's Dynamic Spectrum Management

Dynamic Spectrum Management (DSM) is an approach to improve the efficiency of wireless spectrum usage with a centrally co-ordinating database. The majority of the spectrum is under used, by understanding the current and intended usage, DSM enables it to be utilized more efficiently than a single-user approach. Using a geo-location database containing details of assets and rules, DSM enables spectrum to be allocated in real-time based on the location of the user and other considerations such as radio parameters and type of usage.

TV white spaces (TVWS) are parts of the wireless spectrum that were freed up during the digital TV switchover. Using DSM to manage the usage of the spectrum, TVWS radios offer broadband speeds over several kilometers and the signal can travel through permanent obstacles such as buildings and trees, as well as around terrain.

Nominet has operated commercially a TVWS database in the UK since January 2016.

NOMINET

Visit us at www.nominet.uk/emerging-technology/dynamic-spectrum-management/

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