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FCC PART 15.Subpart H White Spaces System
Part 2 TEST REPORT
Fixed TVBD Device

Applicant	REDLINE COMMUNICATIONS, INC.
Address	302 TOWN CENTRE BLVD. SUITE 100 MARKHAM, ONTARIO L3R 0E8 CANADA
FCC ID	QC8-RDL3000RMF
Model Number	RDL-3000 UHF
Product Description	White Space Fixed TVBD
Date Sample Received	02/01/2013
Date Tested	02/06/2013
Tested By	Sushant Kadimdivan
Approved By	Mario de Aranzeta
Report Number	15 SubPt H Part 2 REPORT.doc
Test Results	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.



Testing Certificate # 0955-01

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GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

The test results relate only to the items tested.

Summary

The device under test does:

- fulfill the general approval requirements as identified in this test report
 not fulfill the general approval requirements as identified in this test report

Attestations

The scope of this document is to report the results of the Fixed TVBD Part 2 Database Interface Certification tests.

There are three (3) components of the White Spaces technology;

- **TV Band devices (Fixed TVBD for Certification).**
- **TV Bands Database (Spectrum Bridge Certified White Space Database)**
- **TV Band System**, Made up of Fixed TVBD's database, and layer of interaction between the devices and the databases.

To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025: 2005 requirements.



Testing Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669

Authorized Signatory Name: Mario de Aranzeta



Compliance Engineer

Date: April 3, 2013

APPLICANT. REDLINE COMMUNICATIONS, INC.

FCC ID: QC8-RDL3000RMF

REPORT: R\Redline_QC8\208BUT13\208BUT13TestReport.doc

GENERAL INFORMATION

EUT Description

General:

The RDL-3000-RMF UHF 2x2 MIMO broadband radio provides high capacity, long range communications links. Operating in the 470-698MHz band, the RDL-3000-RMF is configured via firmware options and electronic product keys. It can be upgraded later without having to replace any hardware. Powered by Redline’s innovative next generation Orthogonal Frequency Division Multiplexing (OFDM) technology, the RDL-3000-RMF radio uses a proprietary OFDM protocol derived from the IEEE 802.11a standard. It implements powerful hardware accelerators and MIMO technology that achieves the highest throughput, lowest latency, and the greatest line-of-sight (LOS) and non-line-of-sight (NLOS) range in the industry, even in the most challenging urban and industrial environments. It supports a full range of Quality of Service (QoS) controls to enable premium access services for voice, data, and video services. Its industry leading capacity also supports the maximum number of video cameras with the highest video quality. With AES-128 encryption standard or optionally AES-256 encryption and X.509 certificate based authentication, the RDL-3000-RMF delivers unparalleled security.

EUT Specification:

Applicable Standard	Part 15 Subpart H TV Band White Space Fixed Device		
EUT Description	Transceiver – Single preferred channel		
FCC ID	QC8-RDL3000RMF		
Application:	High capacity, long range communications links		
Operating Frequency	473-695 MHz		
Number of channels	TV channels #14 through #35 and #39 through #51		
Transmit Power(dBm):	+18dBm RMS per RF channel (ch #35 and #39 limited to +16dBm max)		
EUT Power Source	<input type="checkbox"/> 110–120Vac/50– 60Hz <input checked="" type="checkbox"/> DC 48V nominal via POE injector, <0.4A CINCON TR60A-POE-L <input type="checkbox"/> Battery Operated Exclusively		
Test Item	<input type="checkbox"/> Prototype	<input type="checkbox"/> Pre-Production	<input checked="" type="checkbox"/> Production
Type of Equipment	<input checked="" type="checkbox"/> Fixed - WGF	<input type="checkbox"/> Mobile – WG1	<input type="checkbox"/> Portable – WG2
	<input type="checkbox"/> Fixed - WSF	<input type="checkbox"/> Mobile – WS1	<input type="checkbox"/> Portable – WS2
Antenna Connector	50 ohm F- connector x2		
Antenna model	Antenna #1: Redline, AFS-VH-60060-01 Antenna Sectoral 470-698MHz 13dBi 48in(122cm) 60deg vpol & hpol - 2x2 MIMO cross-polarized configuration Antenna#2: Redline, ALP-SB-60055-01 Antenna Log-P Directional 470-698MHz 11dBi 48in(122cm) 55deg vpol & hpol - 2x2 MIMO cross-polarized configuration		

APPLICANT: REDLINE COMMUNICATIONS, INC.
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Network Port	RJ 45
Serial Port	NA
Indicators	<input type="checkbox"/> Power Indicator
	<input type="checkbox"/> Alarm Indicator
	<input type="checkbox"/> Transmit Indicator

Test Facility	Timco Engineering Inc. 849 NW State Road 45 Newberry, FL 32669 USA.
Test Conditions	Temperature: 26°C Relative humidity: 50%
Test Exercise	The EUT was tested in normal operator mode.

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 03/24/12	3/124/14
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 10/28/11	10/28/13
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 10/28/11	10/28/13
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 10/28/11	10/28/13
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 10/28/11	10/28/13
Spectrum Analyzer	R&S	ESIB40	100274	3/16/12	3/16/14

TEST PROCEDURES

Database Test: Certification Test Procedures for TV Band (White Spaces) Devices Authorized under Subpart H of the Part 15 Rules, 416721 DO1 White Space Test Procedures v02.

APPLICANT: REDLINE COMMUNICATIONS, INC.
 FCC ID: QC8-RDL3000RMF
 REPORT: R\Redline_QC8\208BUT13\208BUT13TestReport.doc

TEST CONFIGURATIONS:

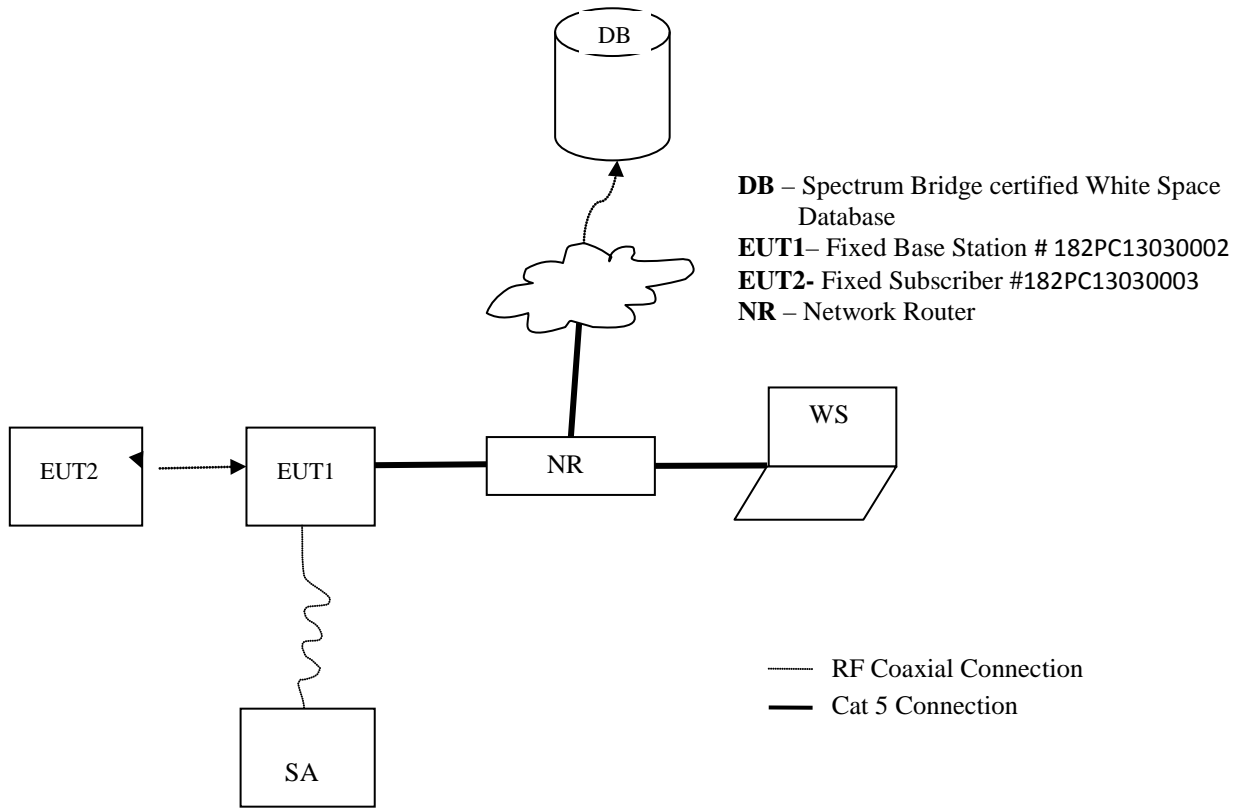


Figure 1 TVBD Configuration

Device and System Operation

This section provides high level description of the White Space test network configuration, Redline TVBD, operations/commands; and the White Spaces system as a whole consisting of White Spaces network and Spectrum Bridge White Spaces Database (WSDB). For purposes of this procedure, the device will be controlled via the EUT html GUI. In order to connect the work station to the EUT, the operator will have to have knowledge of the EUT static IP address and set the workstation with an IP address within the same subnet range.

Test Network Configuration

The RDL-3000-RMF transmits on a single pre-configured TV White Space channel in the UHF frequency band. The bench test network configuration is shown in Figure 1 above. The elements of the test setup are:

- EUT1 –### Base Station White Space Radio Serial #182PC13030002
- EUT2 –### Subscriber White Space Radio Serial #182PC13030003
- NR – standard network router/switch
- WS – workstation (laptop computer) to access TVBD control GUI and record measurements
- SA – spectrum analyzer
- RF attenuators and cabling

The workstation is physically connected to one of the network router LAN ports via RJ45 and establishes a network connection to the EUT and the internet. The routers WAN port connection is required to be capable of providing Internet access.

EUT1 is physically connected to a network router LAN port via its RJ45 network port. EUT1 is called the Base station and has direct connection to the internet. EUT2 (the subscriber) is connected to EUT1 via a Coax link. EUT2 has no direct connection to the internet. EUT2 can have access to the internet only when the EUT1-EUT2 RF link is operating. All of the device/database tests were executed in normal operational mode. Configuration of EUT is accomplished using product's HTML GUI.

EUT1 is programmed with the 'personality' of a base station and EUT2 is programmed with a 'personality' of a subscriber.

As defined in the FCC's White Spaces Final Rules, the EUT only operates and is tested as Fixed TV Band Devices (TVBDs). The EUT is provisioned or enrolled prior to testing by a Spectrum Bridge representative. In addition, the EUT1 and EUT2 must be configured with registration information to register with Spectrum Bridge WSDB. The firmware loaded in the EUT includes the database interface agent that includes the Spectrum Bridge White Space services URL.

The EUT must be configured with complete registration information using the webpage device interface and will not transmit until it registers and receives a valid channel list. When power is applied and the radio establishes an Internet connection; the Base Station EUT/TVBD sends the registration information to the database via the Internet. The WSDB verifies the TVBD's FCC ID and serial number and upon confirmation, registers the device. The device then requests a channel map for its location. Upon receiving a list of available channels from the database the TVBD will verify if the pre-configured channel is available before enabling transmission.

The following tests address the Radios functionality as a Fixed TVBD and compliance with the FCC's TV White Space Database Interface Certification Rules Part 2.

TEST Summary

This document provides test overviews and test results that apply specifically to Fixed TVBD’s operating in TV White Spaces on an unlicensed secondary use basis.

Test Result Summary

Test Case	P/F/I
§15.713(f)(3) Fixed TVBD Registration(Successful Registration)	P
§15.713(f)(3) Fixed TVBD Registration(Restricted Co-ordinates)	P
§15.713(f)(3) Fixed TVBD Registration(Incomplete Contact Information)	P
§15.713(f)(3) Fixed TVBD Registration(HAAT)	P
§15.713(f)(3) Fixed TVBD Registration(Antenna Height AGL)	P
§15.713(f)(3) Fixed TVBD Registration(FCCID/Serial Number)	P
§15.707(a) Fixed TVBD Relocated	P
§15.711(b)(3)(iii) Fixed & Mode II TVDB Database Update	P
§15.711(b)(3)(i)(ii), §15.713(a)(1) 48 Hour Channel Scheduling	P
§15.707, §15.711(b)(3)(i)(ii)(iv),(c), §15.712 TVBD Channel Availability	P
§15.711(f) Security:	P

P-Pass

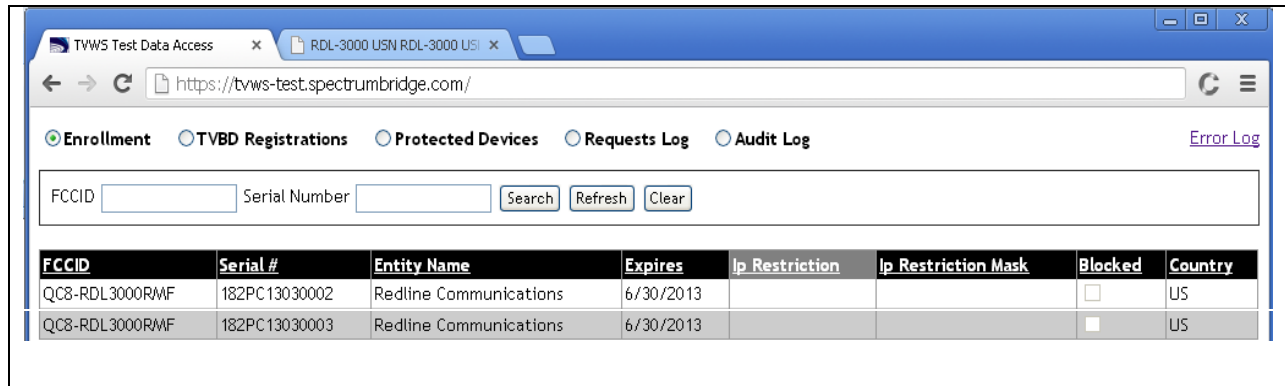
F-Fail

I-Inconclusive

N.A.-not applicable/not supported

Database Enrollment Information

The following screenshot of the log shows the TVBD enrolled in the Spectrum Bridge whitespace database prior to the testing.



Entity Name: Redline Communications
Serial No: 182PC13030002, 182PC13030003
FCC ID: QC8-RDL3000RMF

Setup Photo



APPLICANT. REDLINE COMMUNICATIONS, INC.
FCC ID: QC8-RDL3000RMF
REPORT: R\Redline_QC8\208BUT13\208BUT13TestReport.doc

§15.713(f)(3) Fixed TVBD Registration

a) Successful Registration, 15.713(f)(3) – Fixed TVBD with direct connection to Internet (Base Station)

Test procedure:

Configure the EUT with the required registration information. Verify the required registration information is sent and stored in the white space data base.

Successful registration should be verified by accessing the WSDB registration interface and also the EUT status information page.

Test pre-conditions:

The FCC ID and the serial # of the radio are programmed in the firmware of the radio and cannot be modified with the EUT configuration web tool. A known acceptable location was put into the TVBD. The TVBD was configured as follows and the information submitted for registration to the WSDB.

WSDB Configuration/Control

Registration Information

FCC Identifier	QC8-RDL3000RMF	
Serial Number	182PC13030002	
Device Type	Fixed	
Use GPS	<input type="checkbox"/>	
Latitude	33° 37' 14.5194" North	
Longitude	100° 19' 22.0800" West	
Antenna Height	30	meters
	98	feet
Owner Name	Redline	
Contact Name	Mark	
Contact Street Address	302 Town center Blvd	
Contact City	Markham	
Contact State/Province	On	
Contact Postal Code	12123	
Contact Country	Ca	
Contact Email	support@rdlcom.com	
Contact Phone	9054798344	

Test Results:

The registration request and the response for the successful registration can be seen on the WSDB log below.

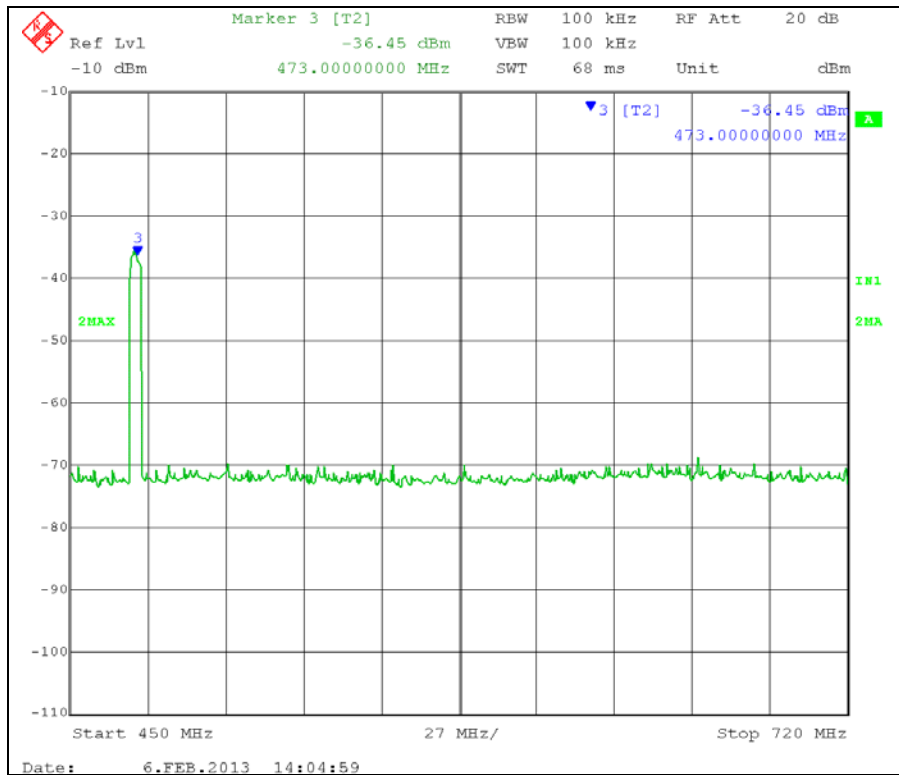
Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 12:07:25 PM	98.191.81.133	/v3/channels/US/33.62070/- 100.32300/?fccid=QC8- RDL3000RMF&serial=182PC13030002&type=8& ant=30.0	Success (0)	580	Response
2/6/2013 12:07:24 PM	98.191.81.133	/v3/devices/US/QC8- RDL3000RMF/182PC13030002	Success (0)	233	Request

The TVBD GUI status page shown below confirms the successful registration. Operating Channel is 14. The transmitter did not turn ON until the database exchange was successfully completed.



The screenshot displays the TVBD GUI status page. At the top, it shows connection status for Wireless and Ethernet, along with radio temperature (40°C / 104°F) and SW Ver (2.25.031). The 'WSDB Status' section provides details on the registration process, including the FCC ID (QC8-RDL3000RMF), WSDb URL (twws-test.spectrumbridge.com), and location (33°37'0.0000" North, 101°19'0.0000" West). The registration status is 'SUCCESS', and the selected channel is 14. The channel list below shows a grid of channels from 2 to 51, with channel 14 highlighted in green, indicating it is the selected operating channel.

Spectrum Analyzer Plot:



Successful Registration

Result: PASS

b) Successful Registration, 15.713(f)(3) – Fixed TVBD without a direct connection to the internet(Subscriber)

Test procedure:

Configure the base station with the required registration information. Verify that the required registration information is sent and stored in the white space data base.

Operating channel should be verified on the subscriber (radio without the internet connection) using the EUT GUI

Test pre-conditions:

The Base station TVBD was configured and the information submitted for registration to the WSDB. The subscriber operating channel was verified with the GUI.

RDL-3000 USH (192.168.45.65)		473 MHz		Wed Feb 06 2013 16:13:41 GMT-0500 (Eastern Standard Time)	
Wireless Link <input type="checkbox"/> Signal <input type="checkbox"/>		Ethernet Link <input type="checkbox"/> 100 <input type="checkbox"/> FD <input type="checkbox"/>		Unsaved Data: No Radio temperature: 39°C / 102°F	
		SW Ver: 2.25.031		Act Links: 1	
WSDB Configuration/Control					
Registration Information					
FCC Identifier	QC8-RDL3000RMF				
Serial Number	182PC13030003				
Device Type	Fixed				
Use GPS	<input type="checkbox"/>				
Latitude	33°	37'	14"	5194"	North
Longitude	100°	19'	22"	0800"	West
Antenna Height	30	meters			
	98	feet			
Owner Name	Redline				
Contact Name	Mark				
Contact Street Address	302 Town Centre Blvd				
Contact City	Markham				
Contact State/Province	OH				
Contact Postal Code	12123				
Contact Country	CA				
Contact Email	support@rdlcom.com				
Contact Phone	9054798344				
<input type="button" value="Apply"/> <input type="button" value="Apply & Save All"/>					

Test Results:

The registration request and the response for the successful registration can be seen on the WSDB log below for the subscriber.

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 1:01:55 PM	98.191.81.133	/v3/channels/US/33.62070/-100.32300/?fccid=QC8-RDL3000RMF&serial=182PC13030003&type=8&ant=30.0	Success (0)	533	Response
2/6/2013 1:01:53 PM	98.191.81.133	/v3/devices/US/QC8-RDL3000RMF/182PC13030003	Success (0)	1266	Request

The TVBD GUI status page shown below confirms the successful registration of the subscriber. Operating Channel is 14. The transmitter did not turn ON until the database exchange was successfully completed.

RDL-3000 USH (192.168.45.65) 473 MHz Wed Feb 06 2013 16:14:29 GMT-0500 (Eastern Standard Time)

Wireless	Link	Signal	Ethernet	Link	100	FD	Unsaved Data:	No	SW Ver:	2.25.031
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Radio temperature:	39°C / 102°F	Act Links:	1

WSDB Status

FCC ID	QC8-RDL3000RMF
WSDB URL	tvws-test.spectrumbridge.com
Location	33°37'0.0000" North, 101°19'0.0000" West
Server Connectivity Status	SUCCESS
Registration Response Timestamp	Wed, 06 Feb 2013 18:01:54 GMT
Registration Status	SUCCESS
Channel List Response Timestamp	Wed, 06 Feb 2013 18:01:56 GMT
Channel List Response Status	SUCCESS
Number of Available Channels	35
Selected Channel	14
Refresh Time	20 h, 47 min, 18 sec
Expiry Time	1 day, 6 h, 45 min, 21 sec

Channel List

2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21
22	23	24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39	40	41
42	43	44	45	46	47	48	49	50	51

Result: PASS

APPLICANT: REDLINE COMMUNICATIONS, INC.
 FCC ID: QC8-RDL3000RMF
 REPORT: R\Redline_QC8\208BUT13\208BUT13TestReport.doc

c) Unsuccessful Registration, 15.713(f)(3) – Restricted co-ordinates

Test Procedure:

Configure the EUT with restricted co-ordinates (Outside US Regulatory boundaries, example 31.5, -106.9). Verify the required registration information is sent and stored in the white space data base. Registration failure should be verified by accessing the WSDB registration interface and also the EUT GUI.

Test Pre-conditions:

A location outside US regulatory boundaries (31.5, -106.9) was entered into the radio and the information submitted for registration to the WSDB.

WSDB Configuration/Control

Registration Information

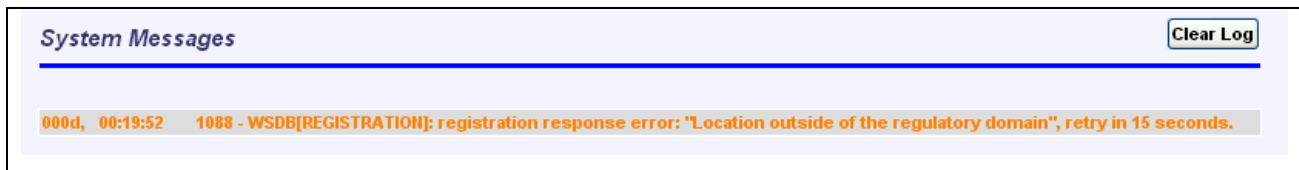
FCC Identifier	QC8-RDL3000RMF		
Serial Number	182PC13030002		
Device Type	Fixed		
Use GPS	<input type="checkbox"/>		
Latitude	31°	30' 00.0000"	North
Longitude	106°	54' 00.0000"	West
Antenna Height	3	meters	
	10	feet	
Owner Name	Redline		
Contact Name	Mark		
Contact Street Address	302 Town center Blvd		
Contact City	Markham		
Contact State/Province	On		
Contact Postal Code	12123		
Contact Country	Ca		
Contact Email	support@rdlcom.com		
Contact Phone	9054798344		

Test Results:

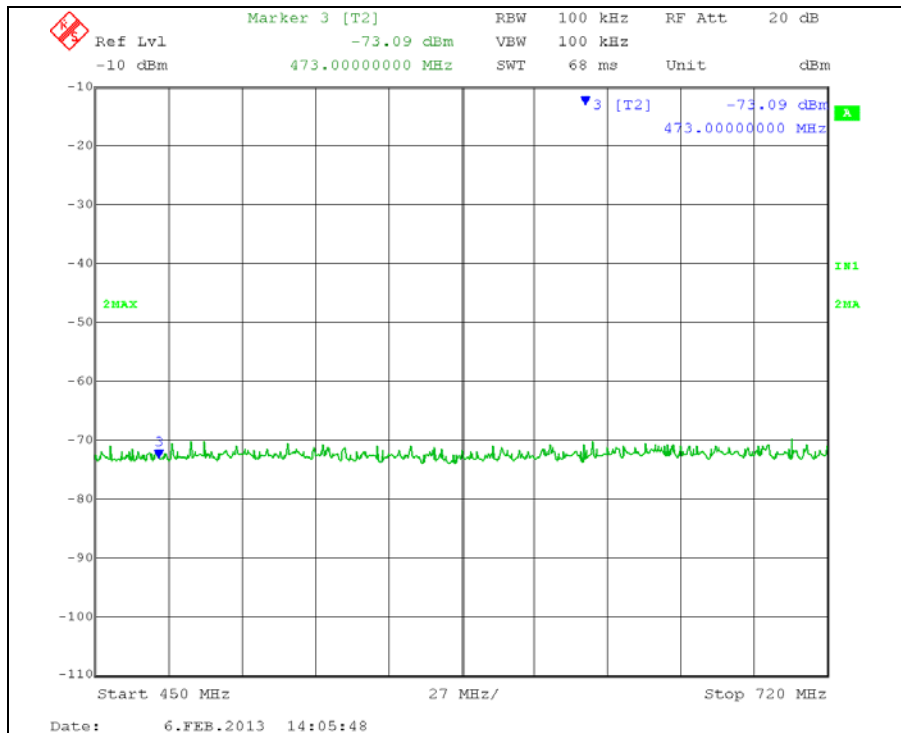
The failed registration with the reason for failure can be seen on the WSDB log below.

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 11:20:38 AM	98.191.81.133	/v3/devices/US/QC8-RDL3000RMF/182PC13030002	LocatedOutsideRegulatoryDomain (9)	140	Request

The screen shot of the TVBD GUI shown below confirms the failed registration. The transmitter did not turn ON.



Spectrum Analyzer plot:



Unsuccessful Registration, no tx

Result: PASS

d) Unsuccessful Registration, 15.713(f)(3) – Incomplete Contact Information

Test Procedure:

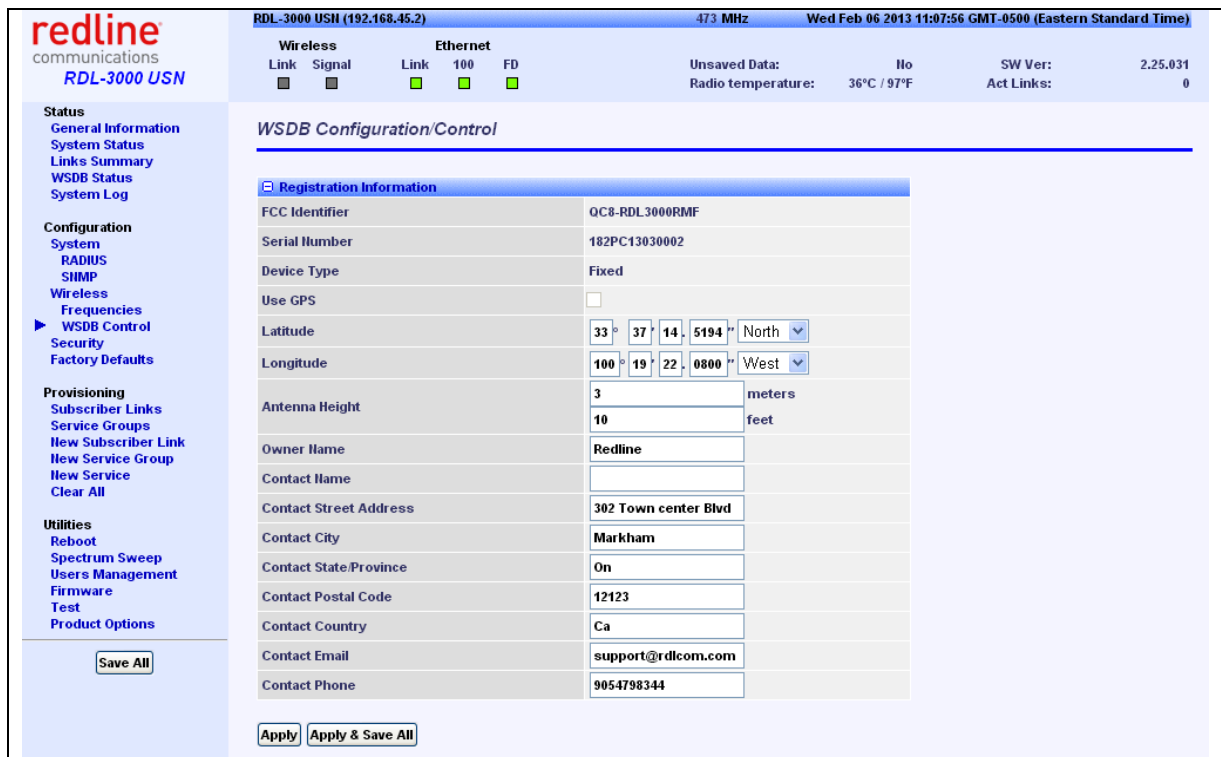
Configure the EUT with Incomplete Information (e.g. Contact information). Verify the required registration information is sent and stored in the white space data base.

Registration failure should be verified by accessing the WSDB registration interface and also the EUT GUI.

Test Pre-conditions:

The 'Contact Name' Information field should be left blank.

Test Results:



redline communications
RDL-3000 USN

RDL-3000 USN (192.168.45.2) 473 MHz Wed Feb 06 2013 11:07:56 GMT-0500 (Eastern Standard Time)

Wireless Link Signal Link 100 FD Ethernet Link 100 FD

Unsaved Data: 0 Radio temperature: 36°C / 97°F SW Ver: 2.25.031 Act Links: 0

WSDB Configuration/Control

Registration Information

FCC Identifier	QC8-RDL3000RMF
Serial Number	182PC13030002
Device Type	Fixed
Use GPS	<input type="checkbox"/>
Latitude	33° 37' 14" 5194" North
Longitude	100° 19' 22" 0800" West
Antenna Height	3 meters
	10 feet
Owner Name	Redline
Contact Name	
Contact Street Address	302 Town center Blvd
Contact City	Markham
Contact State/Province	On
Contact Postal Code	12123
Contact Country	Ca
Contact Email	support@rdlcom.com
Contact Phone	9054798344

Save All Apply Apply & Save All

APPLICANT: REDLINE COMMUNICATIONS, INC.
 FCC ID: QC8-RDL3000RMF
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Test Results:

The system message tab on the TVBD GUI shown below confirms the failed registration. No registration request was sent to the WSDB. All combinations of missing information were tried and the behavior verified. The TVBD GUI does not send a registration request to WSDB with missing contact information.

The transmitter did not turn ON. Spectrum analyzer was used to verify no transmission.

System Messages Clear Log

000d, 00:14:11	1006 - User Configuration Save: OK
000d, 00:14:11	1008 - Network Configuration Save: OK
000d, 00:14:13	1088 - WSDB[REGISTRATION_CHECK]: registration information incomplete.
000d, 00:14:13	1084 - TV channel list from WSDB has expired. TX is OFF.

Result: PASS

e) Unsuccessful Registration, 15.713(f)(3) – HAAT > 250m

Test Procedure:

Configure the EUT with such that HAAT>250m. Verify the required registration information is sent and stored in the white space data base.

Registration failure should be verified by accessing the WSDB registration interface and also the EUT status web page.

Test Pre-conditions:

A location with a HAAT> 250 m (Derived from location, invalid HAAT example - Mt. Hood 45.3648, - 121.6732) was entered into the radio and the information submitted for registration to the WSDB.

WSDB Configuration/Control

Registration Information

FCC Identifier	QC8-RDL3000RMF
Serial Number	182PC13030002
Device Type	Fixed
Use GPS	<input type="checkbox"/>
Latitude	45° 21' 53.28" North
Longitude	121° 40' 23.5194" West
Antenna Height	3 meters 10 feet
Owner Name	Redline
Contact Name	Mark
Contact Street Address	302 Town center Blvd
Contact City	Markham
Contact State/Province	On
Contact Postal Code	12123
Contact Country	Ca
Contact Email	support@rdlcom.com
Contact Phone	9054798344

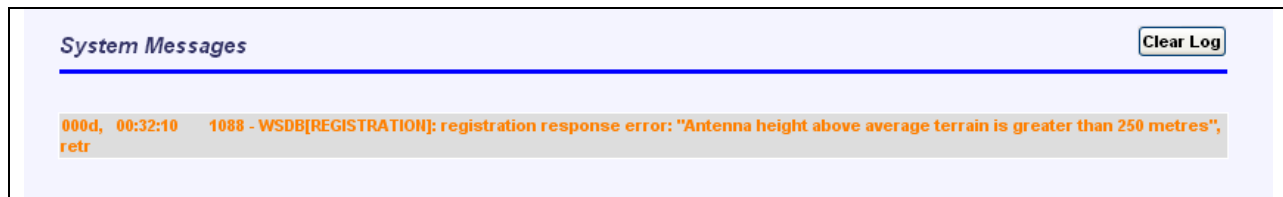
Apply Apply & Save All

Test Results:

The failed registration with the reason for failure can be seen on the WSDB log below.

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 11:33:13 AM	98.191.81.133	/v3/devices/US/QC8-RDL3000RMF/182PC13030002	HaatAbove250m (11)	436	Request

The screen shot of the TVBD GUI shown below confirms the failed registration. The transmitter did not turn ON. Spectrum analyzer was used to verify no transmission.



Result: PASS

f) Unsuccessful Registration, 15.713(f)(3) –Antenna Height AGL> 30m

Test Procedure:

Configure the EUT with such that AGL>30m. Verify the required registration information is sent and stored in the white space data base.

Registration failure should be verified by accessing the WSDB registration interface and also the EUT status web page.

Test Pre-conditions:

Antenna height = 31 m was entered into the radio and the information submitted for registration to the WSDB.

WSDB Configuration/Control

Registration Information

FCC Identifier	QC8-RDL3000RMF	
Serial Number	182PC13030002	
Device Type	Fixed	
Use GPS	<input type="checkbox"/>	
Latitude	33° 37' 14.5194" North	
Longitude	100° 19' 22.08" West	
Antenna Height	31	meters
	102	feet
Owner Name	Redline	
Contact Name	Mark	
Contact Street Address	302 Town center Blvd	
Contact City	Markham	
Contact State/Province	On	
Contact Postal Code	12123	
Contact Country	Ca	
Contact Email	support@rdlcom.com	
Contact Phone	9054798344	

Apply Apply & Save All

Test Results:

The failed registration with the reason for failure can be seen on the WSDB log below.

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 11:42:18 AM	98.191.81.133	/v3/devices/US/QC8-RDL3000RMF/182PC13030002	AntennaHeightAbove30m (10)	0	Request

The screen shot of the TVBD GUI shown below confirms the failed registration. The transmitter did not turn ON. Spectrum analyzer was used to verify no transmission.

System Messages Clear Log

000d, 00:41:16 1088 - WSDB[REGISTRATION]: registration response error: "Antenna height is greater than 30 metres", retry in 15 seconds.

Result: PASS

g) Unsuccessful Registration, 15.713(f)(3) – FCC ID, Serial Number

FCC ID and the Serial Number is a part of the TVBD firmware and cannot be changed.

§15.707(a) Fixed TVBD Relocated

Confirm that the database will not provide a channel list for a Fixed TVBD at a location other than that registered.

Test Procedure:

- ✓ Configure the fixed device with a location that will yield an authorized channel list. Verify proper channel operation using a spectrum analyzer and the device management interface.
- ✓ Reconfigure (change) the configured location of the fixed device. Power cycle the device.
- ✓ Verify that the fixed device receives a channel map request exception, and does not transmit using white space frequencies using a spectrum analyzer and the device management interface.

Test Data:

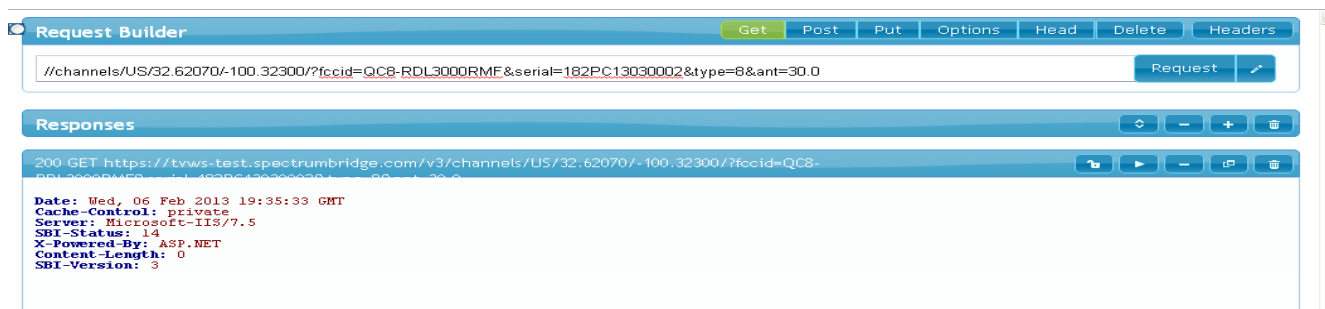
The radio is not capable of separating the registration and channel request commands, so a simulator was used to verify this test. Spectrum Bridge has worked with the radio vendor to implement and test the interface between the radio device and Spectrum Bridge’s FCC certified TVWS database.

When the channel request is sent through the simulator as a type 8 device (fixed) channel list is not granted by the database and an error 14 code is sent.

WSDB Log for successful registration of the EUT:

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 12:57:37 PM	98.191.81.133	/v3/channels/US/33.62070/-100.32300/?fccid=QC8-RDL3000RMF&serial=182PC13030002&type=8&ant=30.0	Success (0)	560	Response

Simulator requesting a channel list on a location different from where it was registered:



The screenshot shows a 'Request Builder' window with a 'Get' method selected. The request URL is: `//channels/US/32.62070/-100.32300/?fccid=QC8-RDL3000RMF&serial=182PC13030002&type=8&ant=30.0`. The 'Responses' section shows a 200 GET response from `https://twws-test.spectrumbridge.com/v3/channels/US/32.62070/-100.32300/?fccid=QC8-RDL3000RMF&serial=182PC13030002&type=8&ant=30.0`. The response headers are: `Date: Wed, 06 Feb 2013 19:35:33 GMT`, `Cache-Control: private`, `Server: Microsoft-IIS/7.5`, `SBI-Status: 14`, `X-Powered-By: ASP.NET`, `Content-Length: 0`, and `SBI-Version: 3`.

WSDB Log for the response to the TVBD relocated channel request:

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 2:35:32 PM	98.191.81.133	/v3/channels/US/32.62070/- 100.32300/?fccid=QC8- RDL3000RMF&serial=182PC13030 002&type=8&ant=30.0	RequestDoesNotMatchR egistration (14)	1280	

Result: PASS

§15.711(b)(3)(iii) Fixed & Mode II TVDB Database Update

Test Procedure:

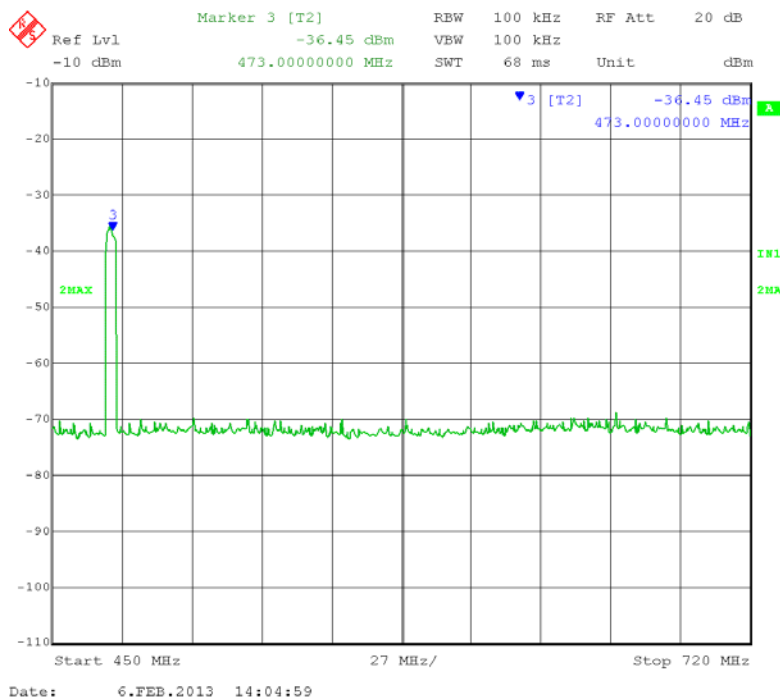
Using a programmable router or similar network device, block the access to the database URL or IP address from the TVBD. Confirm that the TVBD shuts down by 11:59 PM on the following day.

- ✓ Configure the fixed or Mode II device with a location that will yield an authorized channel list. Verify proper channel operation using a spectrum analyzer and the device management interface.
- ✓ Restrict the access to the database.
- ✓ Verify that the device does not transmit using white space frequencies after 11:59 PM the following day. Verify using a spectrum analyzer and the device management interface.

Test Results:

The device is configured to shuts down by 11:59 PM on the following day if access to the database is blocked.

The device was initially powered up and it successfully registered with the database at approximately 5:30 PM. The device received a channel list and started transmitting on channel 14. The connection to the database was then blocked, while maintaining regular access to the internet.



Device transmitting on CH14

Ping result to check link:

2013-02-06 18:02:57.559: -t -T -s60000 -F pingresult1.txt 192.168.45.2
Source address is 192.168.45.115; using ICMP echo-request, ID=2c04
Pinging 192.168.45.2 [192.168.45.2] with 32 bytes data (60 bytes IP):

2013-02-06 18:02:57.559: From 192.168.45.2: bytes=60 seq=0001 TTL=64 ID=770d time=5.739ms
2013-02-06 18:03:57.511: From 192.168.45.2: bytes=60 seq=0002 TTL=64 ID=e60e time=5.064ms
2013-02-06 18:04:57.463: From 192.168.45.2: bytes=60 seq=0003 TTL=64 ID=5310 time=5.042ms
2013-02-06 18:05:57.414: From 192.168.45.2: bytes=60 seq=0004 TTL=64 ID=bf11 time=5.097ms
2013-02-06 18:06:57.350: From 192.168.45.2: bytes=60 seq=0005 TTL=64 ID=2c13 time=4.739ms
2013-02-06 18:07:57.302: From 192.168.45.2: bytes=60 seq=0006 TTL=64 ID=9a14 time=4.955ms
2013-02-06 18:08:57.268: From 192.168.45.2: bytes=60 seq=0007 TTL=64 ID=0616 time=5.344ms
2013-02-06 18:09:57.239: From 192.168.45.2: bytes=60 seq=0008 TTL=64 ID=7717 time=5.439ms
2013-02-06 18:10:57.210: From 192.168.45.2: bytes=60 seq=0009 TTL=64 ID=e618 time=5.590ms
2013-02-06 18:11:57.181: From 192.168.45.2: bytes=60 seq=000a TTL=64 ID=571a time=5.263ms
2013-02-06 18:12:57.153: From 192.168.45.2: bytes=60 seq=000b TTL=64 ID=c61b time=5.043ms
2013-02-06 18:13:57.129: From 192.168.45.2: bytes=60 seq=000c TTL=64 ID=311d time=4.984ms
2013-02-06 18:14:57.108: From 192.168.45.2: bytes=60 seq=000d TTL=64 ID=9b1e time=4.925ms
2013-02-06 18:15:57.072: From 192.168.45.2: bytes=60 seq=000e TTL=64 ID=0720 time=5.951ms
2013-02-06 18:16:57.051: From 192.168.45.2: bytes=60 seq=000f TTL=64 ID=7621 time=5.086ms
2013-02-06 18:17:57.029: From 192.168.45.2: bytes=60 seq=0010 TTL=64 ID=df22 time=4.920ms
2013-02-06 18:18:57.010: From 192.168.45.2: bytes=60 seq=0011 TTL=64 ID=4e24 time=5.847ms

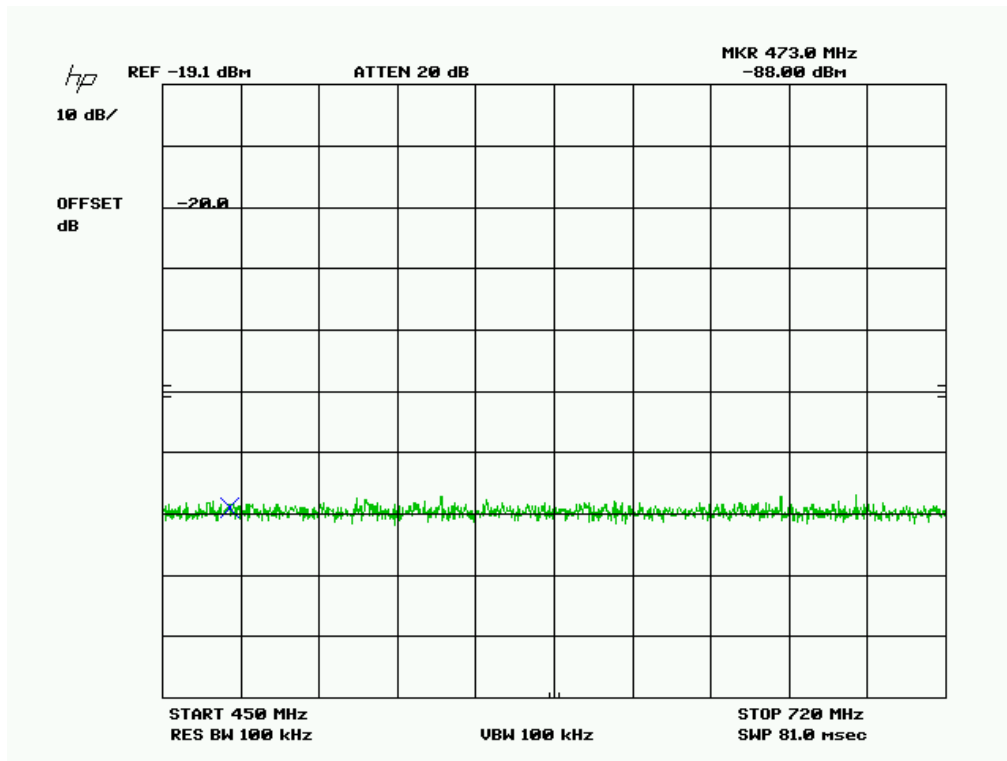
.
. .
. .
. .
. .

2013-02-07 22:24:17.315: From 192.168.45.2: bytes=60 seq=01a1 TTL=64 ID=9ed7 time=5.121ms
2013-02-07 22:25:17.315: From 192.168.45.2: bytes=60 seq=01a2 TTL=64 ID=11d9 time=4.895ms
2013-02-07 22:26:17.315: From 192.168.45.2: bytes=60 seq=01a3 TTL=64 ID=83da time=4.915ms
2013-02-07 22:27:17.315: From 192.168.45.2: bytes=60 seq=01a4 TTL=64 ID=f2db time=4.843ms
2013-02-07 22:28:17.315: From 192.168.45.2: bytes=60 seq=01a5 TTL=64 ID=64dd time=4.826ms
2013-02-07 22:29:17.315: From 192.168.45.2: bytes=60 seq=01a6 TTL=64 ID=d7de time=5.820ms
2013-02-07 22:30:17.315: From 192.168.45.2: bytes=60 seq=01a7 TTL=64 ID=4de0 time=5.339ms
2013-02-07 22:31:17.315: From 192.168.45.2: bytes=60 seq=01a8 TTL=64 ID=c1e1 time=6.096ms
2013-02-07 22:32:17.300: From 192.168.45.2: bytes=60 seq=01a9 TTL=64 ID=2fe3 time=5.290ms
2013-02-07 22:33:17.300: From 192.168.45.2: bytes=60 seq=01aa TTL=64 ID=a6e4 time=5.661ms
2013-02-07 22:34:17.300: From 192.168.45.2: bytes=60 seq=01ab TTL=64 ID=1ae6 time=5.651ms
2013-02-07 22:35:17.300: From 192.168.45.2: bytes=60 seq=01ac TTL=64 ID=94e7 time=5.877ms
2013-02-07 22:36:17.300: From 192.168.45.2: bytes=60 seq=01ad TTL=64 ID=0ae9 time=5.401ms
2013-02-07 22:37:17.300: From 192.168.45.2: bytes=60 seq=01ae TTL=64 ID=7cea time=4.701ms
2013-02-07 22:38:17.300: From 192.168.45.2: bytes=60 seq=01af TTL=64 ID=f5eb time=5.941ms
2013-02-07 22:39:17.300: From 192.168.45.2: bytes=60 seq=01b0 TTL=64 ID=69ed time=5.432ms

APPLICANT. REDLINE COMMUNICATIONS, INC.
FCC ID: QC8-RDL3000RMF
REPORT: R\Redline_QC8\208BUT13\208BUT13TestReport.doc

2013-02-07 22:40:17.300: From 192.168.45.2: bytes=60 seq=01b1 TTL=64 ID=e1ee time=5.186ms
2013-02-07 22:41:17.284: From 192.168.45.2: bytes=60 seq=01b2 TTL=64 ID=56f0 time=5.714ms
2013-02-07 22:42:17.284: From 192.168.45.2: bytes=60 seq=01b3 TTL=64 ID=caf1 time=5.848ms
2013-02-07 22:43:17.284: From 192.168.45.2: bytes=60 seq=01b4 TTL=64 ID=49f3 time=6.130ms
2013-02-07 22:44:17.284: From 192.168.45.2: bytes=60 seq=01b5 TTL=64 ID=bef4 time=5.751ms
2013-02-07 22:45:17.284: From 192.168.45.2: bytes=60 seq=01b6 TTL=64 ID=31f6 time=5.183ms
2013-02-07 22:46:17.284: From 192.168.45.2: bytes=60 seq=01b7 TTL=64 ID=a3f7 time=5.124ms
2013-02-07 22:47:17.284: From 192.168.45.2: bytes=60 seq=01b8 TTL=64 ID=18f9 time=4.771ms
2013-02-07 22:48:17.284: From 192.168.45.2: bytes=60 seq=01b9 TTL=64 ID=8bfa time=4.743ms
2013-02-07 22:49:17.284: From 192.168.45.2: bytes=60 seq=01ba TTL=64 ID=fefb time=5.859ms
2013-02-07 22:50:17.268: From 192.168.45.2: bytes=60 seq=01bb TTL=64 ID=72fd time=5.968ms
2013-02-07 22:51:17.268: From 192.168.45.2: bytes=60 seq=01bc TTL=64 ID=e3fe time=5.340ms
2013-02-07 22:52:17.268: From 192.168.45.2: bytes=60 seq=01bd TTL=64 ID=5a00 time=6.027ms
2013-02-07 22:53:17.268: From 192.168.45.2: bytes=60 seq=01be TTL=64 ID=d101 time=4.930ms
2013-02-07 22:54:17.268: From 192.168.45.2: bytes=60 seq=01bf TTL=64 ID=4203 time=5.895ms
2013-02-07 22:55:17.268: From 192.168.45.2: bytes=60 seq=01c0 TTL=64 ID=b804 time=5.697ms
2013-02-07 22:56:17.268: From 192.168.45.2: bytes=60 seq=01c1 TTL=64 ID=2a06 time=4.648ms
2013-02-07 22:57:17.268: From 192.168.45.2: bytes=60 seq=01c2 TTL=64 ID=a507 time=5.778ms
2013-02-07 22:58:17.268: From 192.168.45.2: bytes=60 seq=01c3 TTL=64 ID=1409 time=5.565ms
2013-02-07 22:59:17.253: From 192.168.45.2: bytes=60 seq=01c4 TTL=64 ID=8a0a time=4.840ms
2013-02-07 23:01:09.253: Timeout waiting for seq=01c5
2013-02-07 23:02:09.253: Timeout waiting for seq=01c6
2013-02-07 23:03:09.253: Timeout waiting for seq=01c7
2013-02-07 23:04:09.253: Timeout waiting for seq=01c8
2013-02-07 23:05:09.253: Timeout waiting for seq=01c9
2013-02-07 23:06:09.253: Timeout waiting for seq=01ca
2013-02-07 23:07:09.253: Timeout waiting for seq=01cb
2013-02-07 23:08:09.253: Timeout waiting for seq=01cc
2013-02-07 23:09:09.253: Timeout waiting for seq=01cd
2013-02-07 23:10:11.237: Timeout waiting for seq=01ce
2013-02-07 23:11:11.237: Timeout waiting for seq=01cf
2013-02-07 23:12:11.237: Timeout waiting for seq=01d0
2013-02-07 23:13:11.237: Timeout waiting for seq=01d1
2013-02-07 23:14:11.237: Timeout waiting for seq=01d2
2013-02-07 23:15:11.237: Timeout waiting for seq=01d3
2013-02-07 23:16:11.237: Timeout waiting for seq=01d4
2013-02-07 23:17:11.237: Timeout waiting for seq=01d5
2013-02-07 23:18:11.237: Timeout waiting for seq=01d6
2013-02-07 23:19:13.222: Timeout waiting for seq=01d7
2013-02-07 23:20:13.222: Timeout waiting for seq=01d8
.
.

The device stopped transmitting at 22:59 the next day. The following spectrum analyzer plot was captured to make sure the transmission had stopped.



Result: PASS

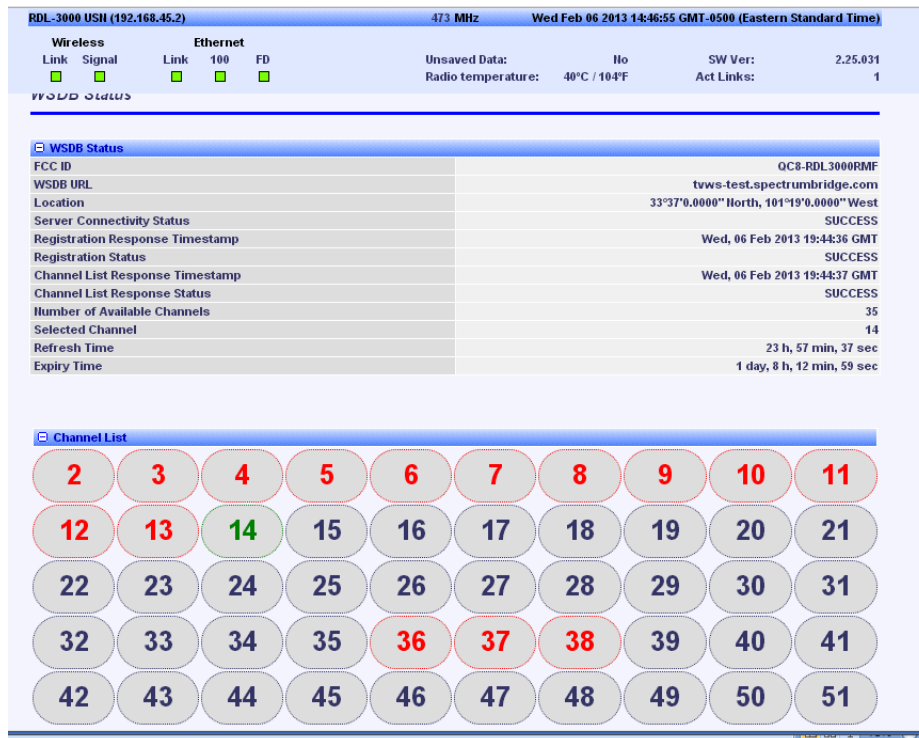
§15.711(b)(3)(i)(ii), §15.713(a)(1) 48 Hour Channel Scheduling

Use the database interface to register protection for a low-power auxiliary device for the same location and channel on which the TVDB (EUT) has selected and is operating. The registered protection for the low-power auxiliary device should be scheduled for protection within the next 48 hour period.

Test Procedure:

- ✓ Configure the TVBD (EUT) such that it can access the database.
- ✓ Verify that EUT requests and receives a valid channel list. Verify the EUT is using an authorized channel using a spectrum analyzer and the device management interface.
- ✓ Use the database interface to register protection for a low-power auxiliary device for the same location and channel on which the TVDB (EUT) has selected and is operating. The registered protection for the low-power auxiliary device should be scheduled for protection within the next 48 hour period.
- ✓ Verify that the EUT requests and receives a new channel list at the scheduled time of the registered low-power channel protection is to take effect.
- ✓ Verify the new channel map does not contain the channel previously protected when the low-power auxiliary device was registered.
- ✓ Verify the EUT is operating on a different channel from what was previously used and subsequently reserved using a spectrum analyzer and the device management interface.

Test Data:



The screenshot displays the following information:

- Device Info:** RDL-3000 USN (192.168.45.2), 473 MHz, Wed Feb 06 2013 14:46:55 GMT-0500 (Eastern Standard Time)
- Wireless/Ethernet Link Status:** All links are shown as active (green squares).
- WSDDB Status:**
 - FCC ID: QC8-RDL3000RMF
 - WSDB URL: twws-test.spectrumbridge.com
 - Location: 33°37'0.0000" North, 101°19'0.0000" West
 - Server Connectivity Status: SUCCESS
 - Registration Response Timestamp: Wed, 06 Feb 2013 19:44:36 GMT
 - Registration Status: SUCCESS
 - Channel List Response Timestamp: Wed, 06 Feb 2013 19:44:37 GMT
 - Channel List Response Status: SUCCESS
 - Number of Available Channels: 35
 - Selected Channel: 14
 - Refresh Time: 23 h, 57 min, 37 sec
 - Expiry Time: 1 day, 8 h, 12 min, 59 sec
- Channel List:** A grid of 51 channels. Channel 14 is highlighted in green, indicating it is the current operating channel. Other channels are shown in various colors (red, blue, grey).

Operating Channel before an auxiliary device is registered.

APPLICANT: REDLINE COMMUNICATIONS, INC.
 FCC ID: QC8-RDL3000RMF
 REPORT: R\Redline_QC8\208BUT13\208BUT13TestReport.doc

The EUT was registered (at 2:44 PM) and verified that a valid channel list was received. The device was transmitting on channel 14.

WSDB Log:

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 2:44:37 PM	98.191.81.133	/v3/channels/US/33.62070/-100.32300/?fccid=QC8-RDL3000RMF&serial=182PC13030002&type=8&ant=30.0	Success (0)	580	Response

The refresh time was verified by clicking on 'response' hyperlink on the WSDB website. The channel list refresh time is indicated to be 48 Hours.

```
<?xml version="1.0" encoding="utf-16"?>
<ChannelResponse xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <ChannelCount>45</ChannelCount>
  <ChannelList>2,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,39,40,41,42,43,44,45,46,47,48,49,50,51</ChannelList>
  <RefreshIn>48</RefreshIn>
</ChannelResponse>
```

Using the database interface here <http://whitespaces-test.spectrumbridge.com> a low-power auxiliary device was registered for the same location and channel on which the TVDB (EUT) has selected and is operating (CH14). The registered protection for the low-power auxiliary device was scheduled for 4 PM.

Entity Information		Contact Information	
Entity Type	Low Power Auxiliary Stations	Name of Entity Owner	Test
Channel Numbers	14	Contact Name	Test
Transmitter Call Sign	LP001	Country	US
Usage Schedule		Address	1234 Main St.
Usage	One Time Event	City	Clermont
Time Zone	(UTC-05:00) Eastern Time (US & Canada)	State	AK
Event Starts	2/6/2013 4:00:00 PM	Postal Code	32746
Event Ends	2/6/2013 9:00:00 PM	Contact Phone	123-123-1234
Location(s)		Contact Email	abcd@abc.com
Point: 33.6207 -100.3228			

Auxiliary Device Enrollment

After the auxiliary device has been registered, the 'channel refresh' time changes to 1 hour. The EUT is still transmitting on channel 14:

WSDB Status

FCC ID	QC8-RDL3000RMF
WSDB URL	twws-test.spectrumbridge.com
Location	33°37'0.0000" North, 101°19'0.0000" West
Server Connectivity Status	SUCCESS
Registration Response Timestamp	Wed, 06 Feb 2013 19:55:34 GMT
Registration Status	SUCCESS
Channel List Response Timestamp	Wed, 06 Feb 2013 19:55:35 GMT
Channel List Response Status	SUCCESS
Number of Available Channels	35
Selected Channel	14
Refresh Time	58 min, 8 sec
Expiry Time	1 day, 8 h, 2 min, 32 sec

Channel List

2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21
22	23	24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39	40	41
42	43	44	45	46	47	48	49	50	51

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 2:55:34 PM	98.191.81.133	/v3/channels/US/33.62070/-100.32300/?fccid=QC8-RDL3000RMF&serial=182PC13030002&type=8&ant=30.0	Success (0)	533	Response

```
<?xml version="1.0" encoding="utf-16"?>
<ChannelResponse xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <ChannelCount>45</ChannelCount>
  <ChannelList>2,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24
,25,26,27,28,29,30,31,32,33,34,35,39,40,41,42,43,44,45,46,47,48,49,50
,51</ChannelList>
  <RefreshIn>1</RefreshIn>
</ChannelResponse>
```

Channel Availability after registration of Low Power Auxiliary Device

With the next channel request, the TVBD receives the updated channel list which excludes CH14 and the Transmitter turns OFF. The EUT is designed to operate on only one preconfigurable channel.

RDL-3000 USH (192.168.45.2) 473 MHz Wed Feb 06 2013 15:56:11 GMT-0500 (Eastern Standard Time)

Wireless	Link	Signal	Ethernet	Link	100	FD	Unsaved Data:	No	SW Ver:	2.25.031
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Radio temperature:	39°C / 102°F	Act Links:	0

WSDB Status

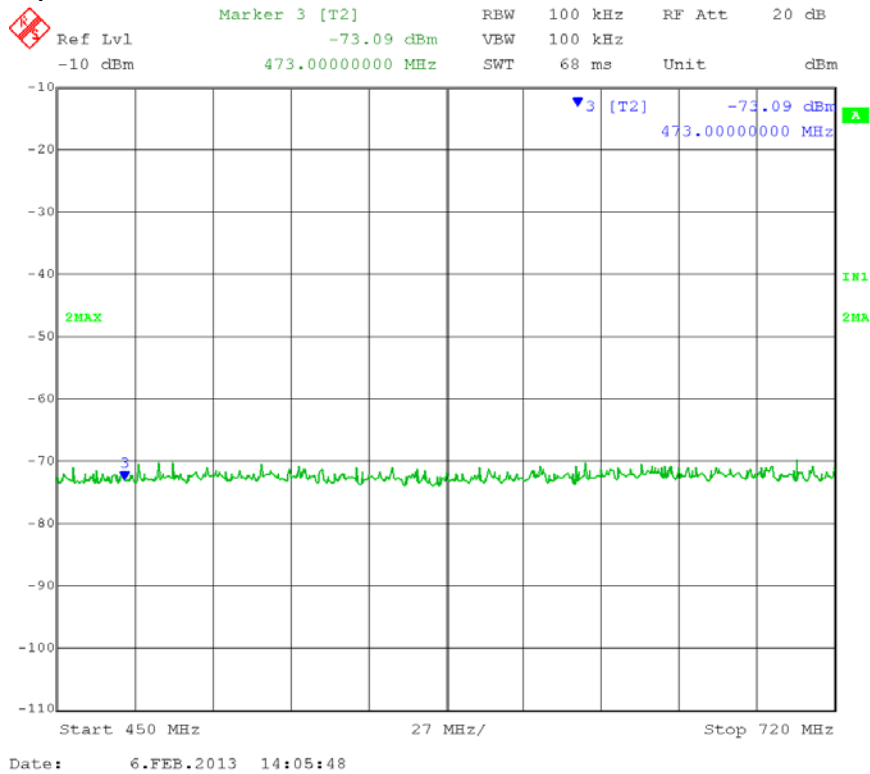
FCC ID	QC8-RDL3000RMF
WSDB URL	twsw-test.spectrumbridge.com
Location	33°37'0.0000" North, 101°19'0.0000" West
Server Connectivity Status	SUCCESS
Registration Response Timestamp	Wed, 06 Feb 2013 19:55:34 GMT
Registration Status	SUCCESS
Channel List Response Timestamp	Wed, 06 Feb 2013 20:55:53 GMT
Channel List Response Status	SUCCESS
Number of Available Channels	34
Selected Channel	14
Refresh Time	23 h, 59 min, 37 sec
Expiry Time	1 day, 7 h, 3 min, 43 sec

Channel List

2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21
22	23	24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39	40	41
42	43	44	45	46	47	48	49	50	51

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 3:55:52 PM	98.191.81.133	/v3/channels/US/33.62070/-100.32300/?fccid=QC8-RDL3000RMF&serial=182PC13030002&type=8&ant=30.0	Success (0)	593	Response

Spectrum Plot: (no TX)



Channel list response with CH 14 missing:

```
<?xml version="1.0" encoding="utf-16"?>
<ChannelResponse xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <ChannelCount>44</ChannelCount>
  <ChannelList>2,5,6,7,8,9,10,11,12,13,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,39,40,41,42,43,44,45,46,47,48,49,50,51</ChannelList>
  <RefreshIn>48</RefreshIn>
</ChannelResponse>
```

EUT GUI SYSTEM MESSAGE:

<i>System Messages</i>	
000d, 01:00:47	1083 - WSDB does not allow current frequency. TX is OFF.
000d, 01:00:48	1075 - Link (4) [00:09:02:14:B5:02]: DOWN
000d, 01:00:50	1047 - MAC Initialization: OK

Results:

After receiving the updated channel listing the EUT turns off the transmitter and this was verified by observing the spectrum analyzer.

§15.707, §15.711(b)(3)(i)(ii)(iv),(c), §15.712 TVBD Channel Availability

Confirm that the channel list provided by the database conforms with those allowable to the class of TVBD under test. Confirm that the TVBD is operating on a channel from the list at authorized power and cannot be made to operate on an unauthorized channel.

Test Procedure:

- 1) Register the TVBD with valid location information.
Verify that the channel list provided by the WSDB conforms to the device type of the TVBD under test.

- 2) All Device types
 - ✓ Configure and register the devices location (34 04 43 N, 107 37 05 W) such that the database returns a channel list that does not allow operation on any channel.
 - ✓ Use a spectrum analyzer to verify that the EUT does not transmit on any white space channel.
 - ✓ Verify that the EUT does not transmit on any channel until it successfully registers and receives a channel list

Test pre condition 1: The device channel request is tested according to fixed device type in this example.

WSDB Configuration/Control

Registration Information

FCC Identifier	QC8-RDL3000RMF
Serial Number	182PC13030002
Device Type	Fixed
Use GPS	<input type="checkbox"/>
Latitude	33 ° 37 ' 14 . 5194 " North
Longitude	100 ° 19 ' 22 . 0800 " West
Antenna Height	30 meters 98 feet
Owner Name	Redline
Contact Name	Mark
Contact Street Address	302 Town center Blvd
Contact City	Markham
Contact State/Province	On
Contact Postal Code	12123
Contact Country	Ca
Contact Email	support@rdlcom.com
Contact Phone	9054798344

Test Result 1:

Wireless		Ethernet			Unsaved Data:	No	SW Ver:	2.25.031
Link	Signal	Link	100	FD	Radio temperature:	40°C / 104°F	Act Links:	1
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				

WSDB Status	
FCC ID	QC8-RDL3000RMF
WSDB URL	tvws-test.spectrumbridge.com
Location	33°37'0.0000" North, 101°19'0.0000" West
Server Connectivity Status	SUCCESS
Registration Response Timestamp	Wed, 06 Feb 2013 17:57:37 GMT
Registration Status	The status in connecting to WSDB server SUCCESS
Channel List Response Timestamp	Wed, 06 Feb 2013 17:57:38 GMT
Channel List Response Status	SUCCESS
Number of Available Channels	35
Selected Channel	14
Refresh Time	22 h, 31 min, 6 sec
Expiry Time	1 day, 8 h, 33 min, 27 sec

Channel List									
2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21
22	23	24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39	40	41
42	43	44	45	46	47	48	49	50	51

Test Result 1:

The database identifies the device type correctly and the channel list provided is correct for the device type.

Test Precondition 2:

A Registration request is sent for a location with no known available channels. Eg: (34.078611, -107.61805)

RDL-3000 USH (192.168.45.2)		473 MHz	Wed Feb 06 2013 16:20:10 GMT-0500 (Eastern Standard Time)	
Wireless Link <input type="checkbox"/> Signal <input type="checkbox"/>		Ethernet Link <input type="checkbox"/> 100 <input type="checkbox"/> FD <input type="checkbox"/>		Unsaved Data: No Radio temperature: 40°C / 104°F
		SW Ver: 2.25.031	Act Links: 0	

WSDB Configuration/Control

Registration Information

FCC Identifier	QC8-RDL3000RMF
Serial Number	182PC13030002
Device Type	Fixed
Use GPS	<input type="checkbox"/>
Latitude	34° 04' 42.9996" North
Longitude	107° 37' 04.9794" West
Antenna Height	30 meters 98 feet
Owner Name	Redline
Contact Name	Mark
Contact Street Address	302 Town center Blvd
Contact City	Markham
Contact State/Province	On
Contact Postal Code	12123
Contact Country	Ca
Contact Email	support@rdlcom.com
Contact Phone	9054798344

Test Result 2:

An empty channel list is received and the transmitter is disabled.

Wireless		Ethernet		Unsaved Data:		SW Ver:	
Link	Signal	Link	100	FD	Radio temperature:	Ho	Act Links:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	39°C / 102°F	0	0

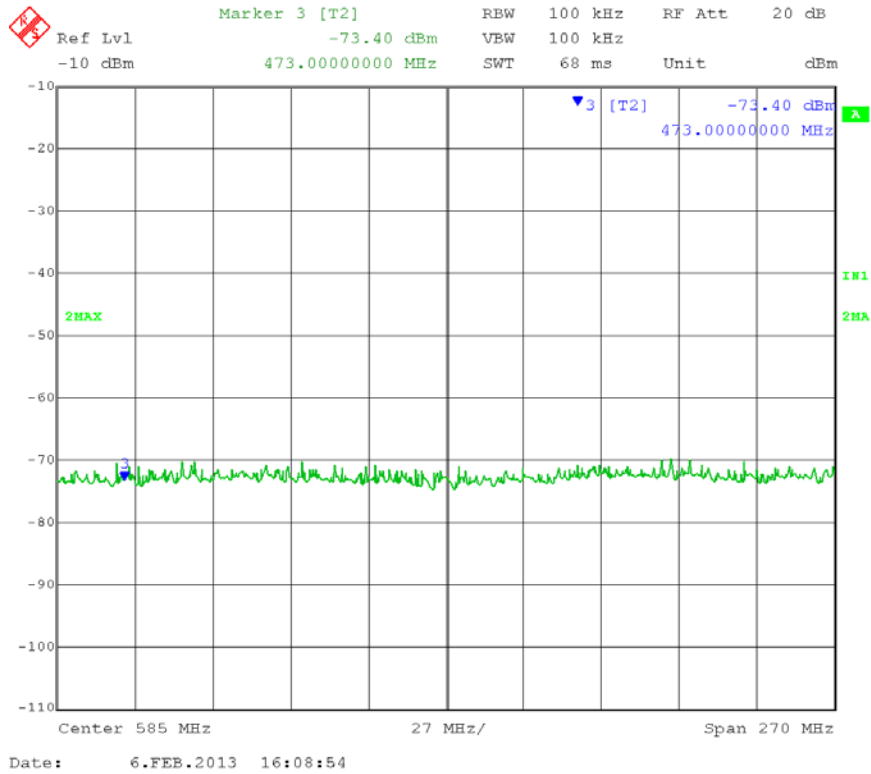
WSDB Status	
FCC ID	QC8-RDL3000RMF
WSDB URL	twws-test.spectrumbridge.com
Location	34°40.0000" North, 108°37'0.0000" West
Server Connectivity Status	SUCCESS
Registration Response Timestamp	Wed, 06 Feb 2013 21:20:11 GMT
Registration Status	SUCCESS
Channel List Response Timestamp	Wed, 06 Feb 2013 21:20:11 GMT
Channel List Response Status	SUCCESS
Number of Available Channels	0
Selected Channel	14
Refresh Time	23 h, 58 min, 20 sec
Expiry Time	1 day, 7 h, 38 min, 8 sec

Channel List									
2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21
22	23	24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39	40	41
42	43	44	45	46	47	48	49	50	51

Date	Ip	Url	Status	RT (ms)	Data
2/6/2013 4:20:12 PM	98.191.81.133	/v3/channels/US/34.07861/-107.61805/?fccid=QC8-RDL3000RMF&serial=182PC13030002&type=8&ant=30.0	Success (0)	313	Response

```
<?xml version="1.0" encoding="utf-16"?>
<ChannelResponse xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <ChannelCount>0</ChannelCount>
  <ChannelList />
  <RefreshIn>48</RefreshIn>
</ChannelResponse>
```

Spectrum Analyzer screenshot:



Results: The radio did not/does not transmit until it receives a valid channel list.

§15.711(f) Security:

Please see the attached document, TVBD Secure Communications.pdf