

8.8 FCC15.713(g)(3)(vii) Unsuccessful registration due to incomplete information – contact city

8.8.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(vii) Address for the contact person

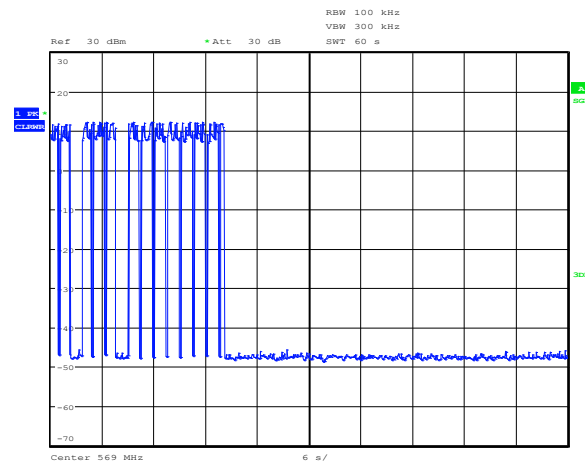
8.8.2 Test summary

Test date	February 29, 2016	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	32 %

8.8.3 Observations, settings and special notes

EUT was configured with incomplete information: contact city field was left intentionally blank (instead of *Ottawa*). It was verified, that after detecting missing contact information, EUT did not send any form request to database, the EUT stopped the transmission. To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was re-initiated. Once the device detects an invalid registration field, the device ceased to transmit and flagged the error in the GUI. The test was repeated when the device is configured as a Master as well as a Slave. If incomplete registration information is detected during the initial power up the device will not attempt to register and will flag the error to the user.

8.8.4 Test data



Date: 29.FEB.2016 11:04:09

Figure8.8-1: Unsuccessful registration with missing contact city of master device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with invalid data the transmission stopped right after the EUT detected missing contact city in the registration form. If the EUT detects a missing contact city during initial power up, the device will not attempt to register with the database, will not transmit and will flag the error to the user.

```

(GWS Cmd > showregistration
...Registration Info...
URL:
twms-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
GH
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@gharmonics.com
ContactTelephone:
6133661768
GWS Cmd >

setlatitude 31.5
setlongitude -106.9
setlatitude 44.429534
setlongitude -75.15075
setowner
setowner GH
setowner GH
setcontactname
setcontactname info
getcontactaddress
es Gate
setcontactaddress
setcontactaddress Suite 10-21 Concourses Gate
setcontactstate
setcontactstate ON
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity

---No station connected---
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWAddr AC:EE:38:02:00:9E
10:38:00 up 46 min, load average: 0.11, 0.26, 0.29
MemFree: 38992 kB
Channel:
30
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
TX Down

read getchanbw is 5
chanbw == SSINGLE CHAN
14 15 16 25 26 27 28 29 30 31 32 33 34 35 39 43 44 45 46 47 48 49 50 51
valid FCC number Of Chans=24
TX State=TX Down
Get channel List,Turn Tx On
Write Chanlist to file with number of channel = 24:
14 15 16 25 26 27 28 29 30 31 32 33 34 35 39 43 44 45 46 47 48 49 50 51
getchanbw in ConfigBTS is 5
Setting frequency to 569 MHz
configBTS() at line 412 ***current chan=30
configBTS line 432 current channel=30 within chanlist
Tx is on
(GWS Cmd > restartwsagentcar
main() at line 110 numOfChans=0
main() at line 113 numOfChans=0 from Database
main() at line 116 refreshHrs=0 of database
main() at line 121 queryIntervalInMin = 0 from agent
current time=Mon Feb 29 10:37:40 2016

chanlist time=Sun Jan 0 00:00:00 1900

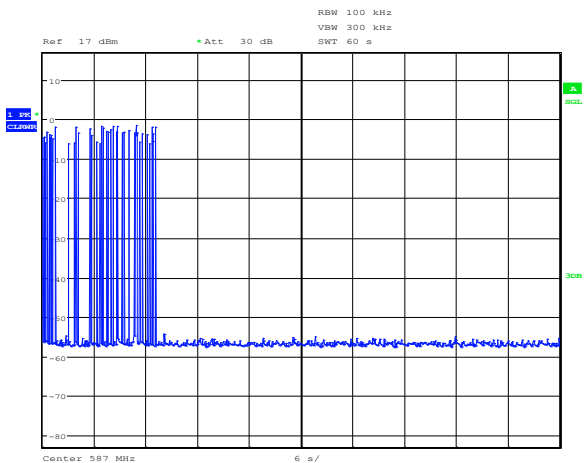
expire time=0 current time=42397
Channel List Will expire in -42397 Minutes
Channel List Expired
numOfChans=0 from Database
<Channels:>
read getchanbw is 5
chanbw == SSINGLE CHAN

valid FCC number Of Chans=0
Turn Tx Off
(GWS Cmd > netval = 1 serialNumber = 620000096
Contact info can not be empty. Please add ContactCity in registration info
txoff() at line 64 clear shared memory

Delay 30 sec

```

Figure8.8-2: Data log of unsuccessful registration with missing contact city of master device



Date: 29.FEB.2016 14:49:29

Figure 8.8-3: Unsuccessful registration with missing contact city of slave device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with invalid data the transmission stopped right after the EUT detected missing contact city in the registration form. If the EUT detects a missing contact city during initial power up, the device will not attempt to register with the database, will not transmit and will flag the error to the user.

```

[GWS Cmd > showregistration
...Registration Info...
URL:
tvws-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
6H
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@6harmonics.com
ContactTelephone:
6133661768
GWS Cmd >]

Setting frequency to 587 MHz
setchan 33
setcontactaddress
setchan 33
Setting frequency to 587 MHz
setcontactaddress Suite 10-21 Concourses Gate
setcontactaddress Suite 10-21 Concourses Gate
setchan 33
Setting frequency to 587 MHz
setcontactstate
setcontactstate ON
setchan 33
Setting frequency to 587 MHz
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity
setchan 33
Setting frequency to 587 MHz

---No station connected---
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:38:02:08:9E
14:23:31 up 24 min, load average: 0.69, 0.57, 0.45
MemFree: 39344 kB
Channel:
35
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
Channel Expire In NoValidChannel Minutes
Query Time Left In N/A Minutes

Server: Microsoft-IIS/8.5
SBI-Version: 3
SBI-Status: 0
X-Powered-By: ASP.NET
Date: Mon, 29 Feb 2016 19:20:50 GMT
Connection: close

<ChannelResponse xmlns="http://schemas.datacontract.org/2004/07/SpectrumBridge.WhiteSpaces.Services.v3" xmlns:i="http://www.w3.org/2001/XMLSchema-instance"><ChannelCount>32</ChannelCount><ChannelList>2,5,6,9,10,11,12,13,14,15,16,25,26,27,28,29,30,31,32,33,34,35,39,43,44,45,46,47,48,49,50,51</ChannelList><RefreshIn>48</RefreshIn></ChannelResponse>
HTTP Status:200
WhiteSpace Status :0
processWS_STATE_WAIT_FOR_CHANNEL_RESPONSE() line 649 wsCtx->queryIntervalInMin=1380
Available Channels:<2 5 6 9 10 11 12 13 14 15 16 25 26 27 28 29 30 31 32 33 34 35 39 43 44 45 46 47 48 49 50 51 >
Channel Refresh In 48 Hrs
Get Channel list from Database...
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
Current WSAgent State: WS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE
GWS Cmd > restartwsagentear
GWS Cmd >serialNumber = 620000096
Contact info can not be empty. Please add ContactZip in registration info
clearshm() at line 64 clear shared memory
GWS Cmd > restartwsagentear
killall: whitespaceagent: no process killed
GWS Cmd >serialNumber = 620000096
Contact info can not be empty. Please add ContactCity in registration info
clearshm() at line 64 clear shared memory

```

Figure8.8-4: Data log of unsuccessful registration with missing contact city of slave device

8.9 FCC15.713(g)(3)(vii) Unsuccessful registration due to incomplete information – contact country

8.9.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
(vii) Address for the contact person

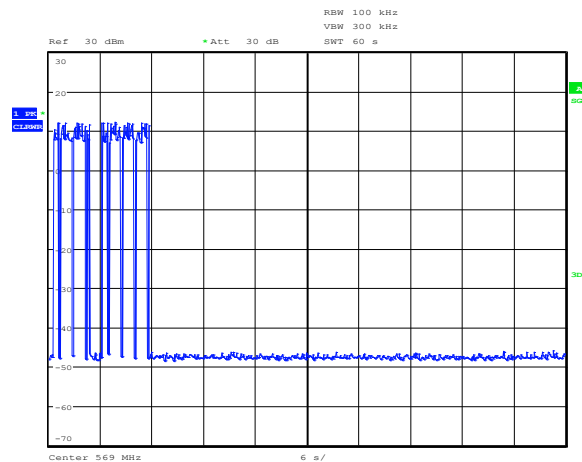
8.9.2 Test summary

Test date	February 29, 2016	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	32 %

8.9.3 Observations, settings and special notes

EUT was configured with incomplete information: contact country field was left intentionally blank (instead of CA). It was verified, that after detecting missing contact information, EUT did not send any form request to database, the EUT stopped the transmission. To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was re-initiated. Once the device detects an invalid registration field, the device ceased to transmit and flagged the error in the GUI. The test was repeated when the device is configured as a Master as well as a Slave. If incomplete registration information is detected during the initial power up the device will not attempt to register and will flag the error to the user.

8.9.4 Test data



Date: 29.FEB.2016 11:05:30

Figure8.9-1: Unsuccessful registration with missing contact country of master device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with invalid data the transmission stopped right after the EUT detected missing information in the registration form. If the EUT detects a missing contact country during initial power up, the device will not attempt to register with the database, will not transmit and will flag the error to the user.


```

[GWS Cmd > showregistration
...Registration Info...
URL:
twis-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
6H
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
Ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
[red box]
ContactEmail:
info@gharmonics.com
ContactTelephone:
6133661768
GWS Cmd >

setlatitude 44.429534
setlongitude -75.15075
setowner
setowner 6H
setowner 6H
setcontactname
setcontactname info
getcontactaddress
Suite 10-21 Concourses Gate
setcontactaddress
setcontactaddress Suite 10-21 Concourses Gate
setcontactstate
setcontactstate ON
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity
setcontactcity Ottawa
setcontactcountry

---No station connected---
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWAddr AC:EE:38:02:00:9E
10:39:27 up 48 min, load average: 0.35, 0.32, 0.31
MemFree: 38860 kB
Channel:
30
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
TX Down.

read getchanbw is 5
chanbw == SSINGLE CHAN
14 15 16 25 26 27 28 29 30 31 32 33 34 35 39 43 44 45 46 47 48 49 50 51
valid FCC number Of Chans=24
TX State=TX Down
Get channel List,Turn Tx On
Write Chanlist to file with number of channel = 24:
14 15 16 25 26 27 28 29 30 31 32 33 34 35 39 43 44 45 46 47 48 49 50 51
getchanbw in ConfigBTS is 5
Setting frequency to 569 MHz
configBTS() at line 412 ***current chan=30
configBTS line 432 current channel=30 within chanlist
Tx is on
[GWS Cmd > restartwsagentcar
main() at line 110 numOfChans=0
main() at line 113 numOfChans=0 from Database
main() at line 116 refreshHrs=0 of database
main() at line 121 queryIntervalInMin = 0 from agent
current time=Mon Feb 29 10:39:14 2016

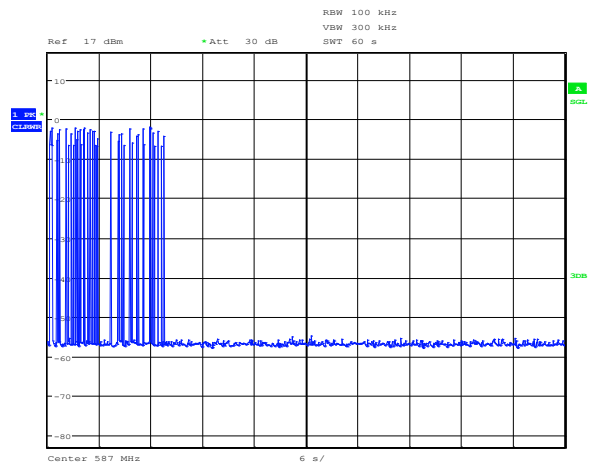
chanlist time=Sun Jan 0 00:00:00 1900

expire time=0 current time=42399
Channel List Will expire in -42399 Minutes
Channel List Expired
numOfChans=0 from Database
<Channels:>
[GWS Cmd > read getchanbw is 5
chanbw == SSINGLE CHAN
valid FCC number Of Chans=0
Turn Tx Off
setval = 1 serialNumber = 6200000096
Contact info can not be empty. Please add ContactCountry in registration info
txoff() at line 64 clear shared memory

Delay 30 sec

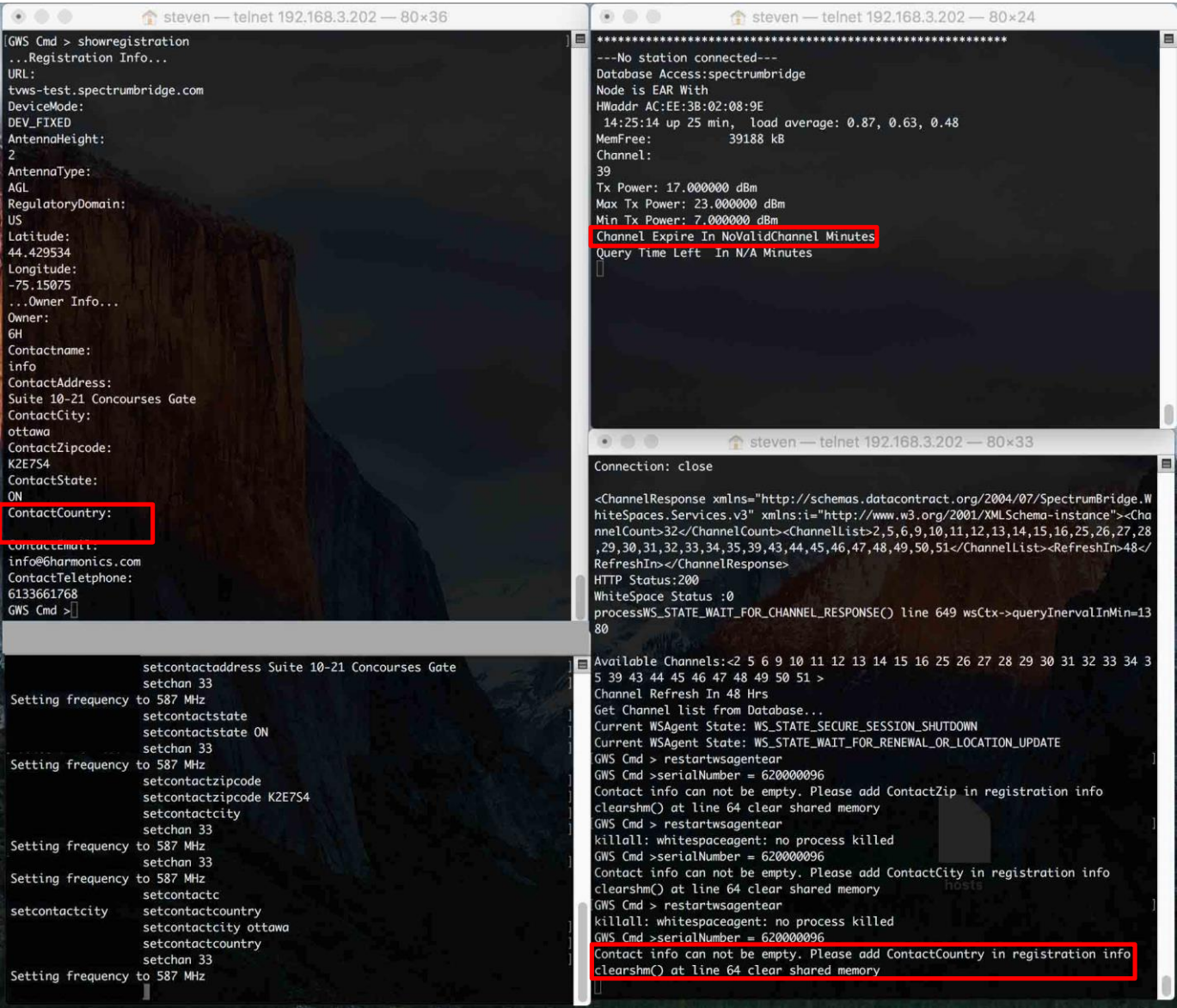
```

Figure8.9-2: Data log of unsuccessful registration with missing contact country of master device



Date: 29.FEB.2016 14:51:10

Figure8.9-3: Unsuccessful registration with missing contact country of slave device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with invalid data the transmission stopped right after the EUT detected missing contact country in the registration form. If the EUT detects a missing contact country during initial power up, the device will not attempt to register with the database, will not transmit and will flag the error to the user.



```
[GWS Cmd > showregistration
...Registration Info...
URL:
tvws-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
GH
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
ContactEmail:
info@gharmonics.com
ContactTelephone:
6133661768
GWS Cmd >]

setcontactaddress Suite 10-21 Concourses Gate
setchan 33
Setting frequency to 587 MHz
setcontactstate
setcontactstate ON
setchan 33
Setting frequency to 587 MHz
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity
setchan 33
Setting frequency to 587 MHz
setchan 33
Setting frequency to 587 MHz
setcontactcity
setcontactcity ottawa
setcontactcountry
setchan 33
Setting frequency to 587 MHz

Available Channels:<2 5 6 9 10 11 12 13 14 15 16 25 26 27 28 29 30 31 32 33 34 3
5 39 43 44 45 46 47 48 49 50 51 >
Channel Refresh In 48 Hrs
Get Channel list from Database...
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
Current WSAgent State: WS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE
GWS Cmd > restartwsagentear
GWS Cmd >serialNumber = 620000096
Contact info can not be empty. Please add ContactZip in registration info
clearshm() at line 64 clear shared memory
GWS Cmd > restartwsagentear
killall: whitespaceagent: no process killed
GWS Cmd >serialNumber = 620000096
Contact info can not be empty. Please add ContactCity in registration info
clearshm() at line 64 clear shared memory
GWS Cmd > restartwsagentear
killall: whitespaceagent: no process killed
GWS Cmd >serialNumber = 620000096
Contact info can not be empty. Please add ContactCountry in registration info
clearshm() at line 64 clear shared memory
```

Figure8.9-4: Data log of unsuccessful registration with missing contact country of slave device

8.10 FCC15.713(g)(3)(viii) Unsuccessful registration due to incomplete information – contact email

8.10.1 Definitions and limits

- (3) The white space device registration database shall contain the following information for fixed white space devices:
(viii) Email address for the contact person

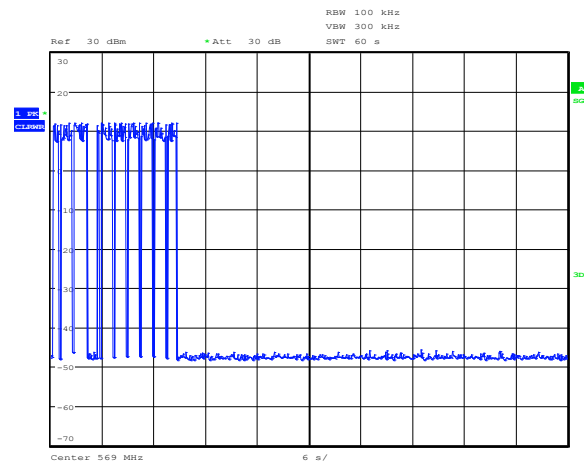
8.10.2 Test summary

Test date	February 29, 2016	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	32 %

8.10.3 Observations, settings and special notes

EUT was configured with incomplete information: contact email field was left intentionally blank (instead of *info@6harmonics.com*). It was verified, that after detecting missing contact information, EUT did not send any form request to database, the EUT stopped the transmission. To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was re-initiated. Once the device detects an invalid registration field, the device ceased to transmit and flagged the error in the GUI. The test was repeated when the device is configured as a Master as well as a Slave. If incomplete registration information is detected during the initial power up the device will not attempt to register and will flag the error to the user.

8.10.4 Test data



Date: 29.FEB.2016 11:06:51

Figure 8.10-1: Unsuccessful registration with missing contact email of master device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with invalid data the transmission stopped right after the EUT detected missing contact email in the registration form. If the EUT detects a missing contact email during initial power up, the device will not attempt to register with the database, will not transmit and will flag the error to the user.

```
GWS Cmd > showregistration
...Registration Info...
URL:
twms-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
GH
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
Ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
ContactTelephone:
6133661768
GWS Cmd >

setowner
setowner GH
setcontactname
setcontactname info
getcontactaddress
Suite 10-21 Concourses Gate
setcontactaddress
setcontactaddress Suite 10-21 Concourses Gate
setcontactstate
setcontactstate ON
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity
setcontactcity Ottawa
setcontactcountry
setcontactcountry CA
getcontactemail
info@gharmonics.com
setcontactemail
setcontactemail

-----No station connected-----
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:EE:38:02:00:9E
10:40:54 up 49 min, load average: 0.57, 0.38, 0.33
MemFree: 38812 kB
Channel:
30
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
TX Down

read getchanbw is 5
chanbw == SSINGLE CHAN
14 15 16 25 26 27 28 29 30 31 32 33 34 35 39 43 44 45 46 47 48 49 50 51
valid FCC number Of Chans=24
TX State=TX Down
Get channel List,Turn Tx On
Write Chanlist to file with number of channel = 24:
14 15 16 25 26 27 28 29 30 31 32 33 34 35 39 43 44 45 46 47 48 49 50 51
getchanbw in ConfigBTS is 5
Setting frequency to 569 MHz
configBTS() at line 412 ***current chan=30
configBTS line 432 current channel=30 within chanlist
Tx is on
GWS Cmd > restartwsagentcar
main() at line 110 numOfChans=0
main() at line 113 numOfChans=0 from Database
main() at line 116 refreshHrs=0 of database
main() at line 121 queryIntervalInMin = 0 from agent
current time=Mon Feb 29 10:40:41 2016

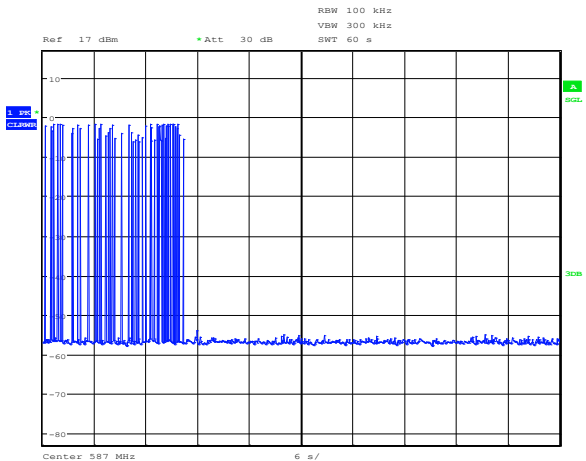
chanlist time=Sun Jan 0 00:00:00 1900

expire time=0 current time=42400
Channel List Will expire in -42400 Minutes
Channel List Expired
numOfChans=0 from Database
<Channels:>
GWS Cmd > read getchanbw is 5
chanbw == SSINGLE CHAN

valid FCC number Of Chans=0
Turn Tx Off
actual = 1 serialNumber = 520000006
Contact info can not be empty. Please add ContactEmail in registration info
txoff() at line 64 clear shared memory

Delay 30 sec
```

Figure8.10-2: Data log of unsuccessful registration with missing contact email of master device



Date: 29.FEB.2016 14:53:23

Figure8.10-3: Unsuccessful registration with missing contact email of slave device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with invalid data the transmission stopped right after the EUT detected missing contact email in the registration form. If the EUT detects a missing contact email during initial power up, the device will not attempt to register with the database, will not transmit and will flag the error to the user.


```
steven — telnet 192.168.3.202 — 80x36
GWS Cmd > showregistration
...Registration Info...
URL:
tvws-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
6H
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
ContactTelephone:
6133661768
GWS Cmd >

steven — telnet 192.168.3.202 — 80x24
---No station connected---
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:3B:02:08:9E
14:27:34 up 28 min, load average: 0.53, 0.59, 0.49
MemFree: 39016 kB
Channel:
43
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
Channel Expire In NoValidChannel Minutes
Query Time Left In N/A Minutes

steven — telnet 192.168.3.202 — 80x33
80
Available Channels:<2 5 6 9 10 11 12 13 14 15 16 25 26 27 28 29 30 31 32 33 34 3
5 39 43 44 45 46 47 48 49 50 51 >
Channel Refresh In 48 Hrs
Get Channel list from Database...
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
Current WSAgent State: WS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE
GWS Cmd > restartwsagentear
GWS Cmd >serialNumber = 6200000096
Contact info can not be empty. Please add ContactZip in registration info
clearshm() at line 64 clear shared memory
GWS Cmd > restartwsagentear
killall: whitespaceagent: no process killed
GWS Cmd >serialNumber = 6200000096
Contact info can not be empty. Please add ContactCity in registration info
clearshm() at line 64 clear shared memory
GWS Cmd > restartwsagentear
killall: whitespaceagent: no process killed
GWS Cmd >serialNumber = 6200000096
Contact info can not be empty. Please add ContactCountry in registration info
clearshm() at line 64 clear shared memory
GWS Cmd > restartwsagentear
killall: whitespaceagent: no process killed
GWS Cmd >serialNumber = 6200000096
Contact info can not be empty. Please add ContactEmail in registration info
clearshm() at line 64 clear shared memory
GWS Cmd > restartwsagentear
killall: whitespaceagent: no process killed
GWS Cmd >serialNumber = 6200000096
Contact info can not be empty. Please add ContactEmail in registration info
clearshm() at line 64 clear shared memory
```

Figure8.10-4: Data log of unsuccessful registration with missing contact email of slave device

8.11 FCC15.713(g)(3)(ix) Unsuccessful registration due to incomplete information – contact telephone

8.11.1 Definitions and limits

- (3) The white space device registration database shall contain the following information for fixed white space devices:
(xi) Phone number for the contact person

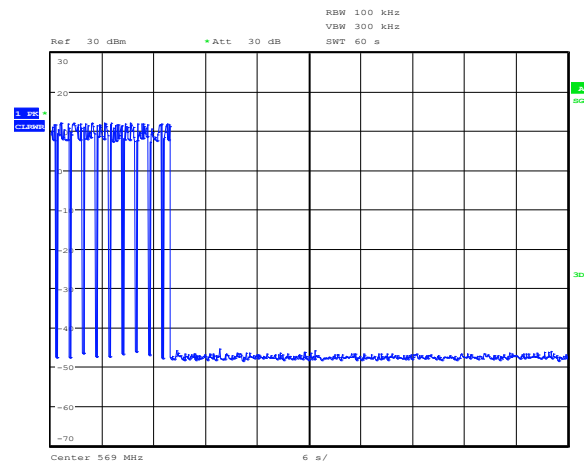
8.11.2 Test summary

Test date	February 29, 2016	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	32 %

8.11.3 Observations, settings and special notes

EUT was configured with incomplete information: contact telephone field was left intentionally blank (instead of 6133661768). It was verified, that after detecting missing contact information, EUT did not send any form request to database, the EUT stopped the transmission. To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was re-initiated. Once the device detects an invalid registration field, the device ceased to transmit and flagged the error in the GUI. The test was repeated when the device is configured as a Master as well as a Slave. If incomplete registration information is detected during the initial power up the device will not attempt to register and will flag the error to the user.

8.11.4 Test data



Date: 29.FEB.2016 11:09:16

Figure8.11-1: Unsuccessful registration with missing contact telephone number of master device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with invalid data the transmission stopped right after the EUT detected missing information in the registration form. If the EUT detects a missing contact telephone number during initial power up, the device will not attempt to register with the database, will not transmit and will flag the error to the user.

The figure consists of three screenshots from a telnet session on a device with IP 192.168.3.202. The first screenshot (top left) shows the output of the 'showregistration' command, displaying registration details for 'twms-test.spectrumbridge.com'. The 'ContactTelephone' field is highlighted with a red box. The second screenshot (top right) shows the device status, including 'TX Down' which is also highlighted with a red box. The third screenshot (bottom) shows the output of the 'chanlist' command, indicating that the channel list has expired and the device is in a 'TX State=GWS_Ready' state. A red box highlights the error message: 'Contact info can not be empty. Please add ContactTelephone in registration info txoff() at line 64 clear shared memory'.

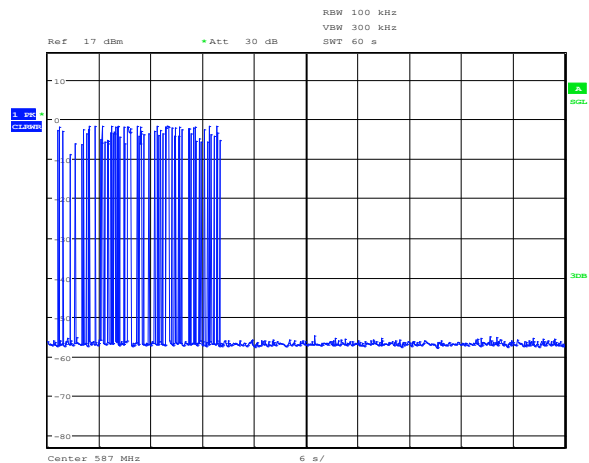
```
GWS Cmd > showregistration
...Registration Info...
URL:
twms-test.spectrumbridge.com
DeviceMode:
DEV_FIXED:
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
GH
Contactname:
info
ContactAddress:
Suite 10-21 Concours Gate
ContactCity:
Ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@6harmonics.com
ContactTelephone:
GWS Cmd >

setcontactname
setcontactname info
getcontactaddress
getcontactaddress Suite 10-21 Concours Gate
Suite 10-21 Concours Gate
setcontactaddress
setcontactaddress Suite 10-21 Concours Gate
setcontactstate
setcontactstate ON
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity
setcontactcity Ottawa
setcontactcountry
setcontactcountry CA
getcontactemail
info@6harmonics.com
setcontactemail
setcontactemail info@6harmonics.com
setcontacttelephone

-----No station connected-----
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:EE:38:02:00:9E
10:43:13 up 52 min, load average: 0.23, 0.32, 0.31
MemFree: 38724 kB
Channel:
30
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
TX Down.

chanlist time=Mon Feb 29 10:41:44 2016
expire time=45281 current time=42403
Channel List Will expire in 2878 Minutes
numOfChans=32 from Database
<Channels:14 15 16 25 26 27 28 29 30 31 32 33 34 35 39 43 44 45 46 47 48 49 50 51 >
read getchanbw is 5
chanbw == SSINGLE CHAN
14 15 16 25 26 27 28 29 30 31 32 33 34 35 39 43 44 45 46 47 48 49 50 51
valid FCC number Of Chans=24
TX State=GWS_Ready
main() at line 234 ***current chan=30
main line 254 current channel=30 within chanlist
GWS Cmd > restartwsagentcar
main() at line 110 numOfChans=0
main() at line 113 numOfChans=0 from Database
main() at line 116 refreshHrs=0 of database
main() at line 121 queryIntervalInMin = 0 from agent
current time=Mon Feb 29 10:43:03 2016
chanlist time=Sun Jan 0 00:00:00 1900
expire time=0 current time=42403
Channel List Will expire in -42403 Minutes
Channel List Expired
numOfChans=0 from Database
<Channels:>
read getchanbw is 5
chanbw == SSINGLE CHAN
valid FCC number Of Chans=0
Turn Tx Off
GWS Cmd > retval = 1 serialNumber = 620000096
Contact info can not be empty. Please add ContactTelephone in registration info
txoff() at line 64 clear shared memory
Delay 30 sec
```

Figure8.11-2: Data log of unsuccessful registration with missing contact telephone of master device



Date: 29.FEB.2016 14:55:18

Figure8.11-3: Unsuccessful registration with missing contact telephone number of slave device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with invalid data the transmission stopped right after the EUT detected missing information in the registration form. If the EUT detects a missing contact telephone number during initial power up, the device will not attempt to register with the database, will not transmit and will flag the error to the user.

8.12 FCC15.713(e)(6) Unsuccessful registration due to HAAT >250 m

8.12.1 Definitions and limits

A fixed device with an antenna height above ground that exceeds 30 meters or an antenna height above average terrain (HAAT) that exceeds 250 meters shall not be provided a list of available channels.

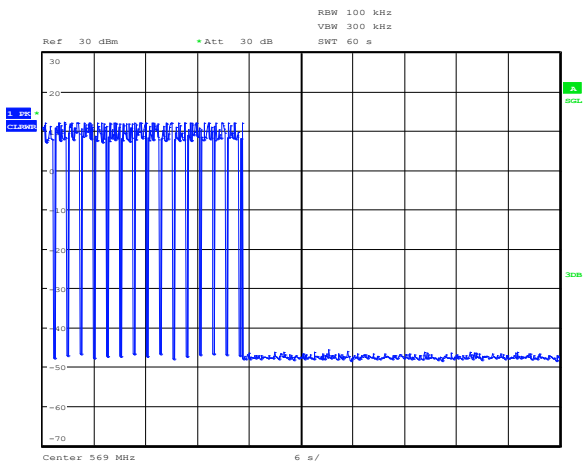
8.12.2 Test summary

Test date	February 29, 2016	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	32 %

8.12.3 Observations, settings and special notes

EUT was configured with information that included a location with HAAT of more than 250 m (Mt. Hood at latitude 45.3648 and longitude -121.6732). It was verified, that after database rejection, the EUT stopped the transmission. To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was re-initiated. Once the database responded with an empty channel list as a result of the antenna height above ground, or excessive HAAT, the EUT stopped to transmit. For the master device, during the initial power up and registration, if the database returns an empty channel list, it will not turn on the transmitter. For the slave device, the EUT will perform a passive scan and will attempt to connect to a master device on a channel where it detects a beacon. Once connected it will attempt to register with the database for up to 1 minute. If the database responds with an empty channel list, or the device is unable to connect to the database, it will cease to transmit on the channel.

8.12.4 Test data



Date: 29.FEB.2016 11:15:13

Figure8.12-1: Unsuccessful registration with restricted HAAT location of master device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with geolocation which coincides with a restrict HAAT, the transmission stopped once the database responded with no valid channels for the given location. For the convenience of the installer, the 6Harmonics GUI displays the error message "HAAT Above 250m".

```
steven — telnet 192.168.3.202 — 81x36
(GWS Cmd > showregistration
...Registration Info...
URL:
twvs-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
45.3648
Longitude:
-121.6732
...Owner Info...
Owner:
6H
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
Ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@gharmonics.com
ContactTelephone:
6133661768
GWS Cmd > ]

steven — telnet 192.168.3.202 — 80x24
-----No station connected-----
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:EE:3B:02:00:9E
10:49:18 up 58 min, load average: 0.08, 0.20, 0.27
MemFree: 38400 kB
Channel:
30
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
TX Down
]

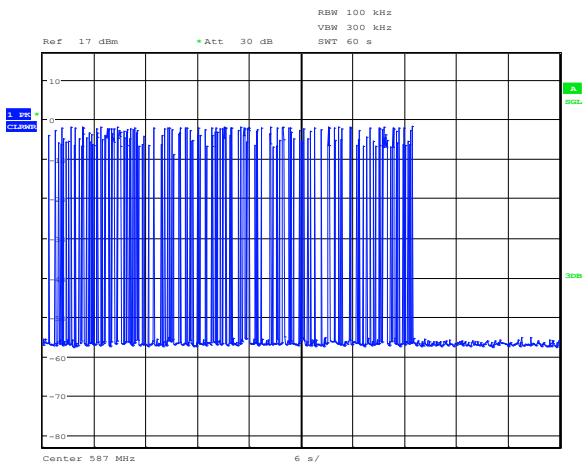
steven — telnet 192.168.3.202 — 93x38
Registration Request Message:PUT https://twvs-test.spectrumbridge.com/v3/devices/US/2AASGWS-
4006-23/620000096 HTTP/1.1
Host: twvs-test.spectrumbridge.com
Content-Type: Application/xml
Connection: close
Content-Length: 612

<RegistrationRequest xmlns="http://schemas.datacontract.org/2004/07/SpectrumBridge.WhiteSpace
s.Services.v3"><AntennaHeight>2</AntennaHeight><ContactCity>Ottawa </ContactCity><ContactCoun
try>CA</ContactCountry><ContactEmail>info@gharmonics.com</ContactEmail><ContactName>info
</ContactName><ContactPhone>6133661768</ContactPhone><ContactState>ON</ContactState><Cont
actStreet>Suite 10-21 Concourses Gate </ContactStreet><ContactZip>K2E7S4</ContactZip><De
viceOwner>6H </DeviceOwner><DeviceType>8</DeviceType><Latitude>45.3648</Latitude><Lon
gitude>-121.6732</Longitude></RegistrationRequest>

Current WSAgent State: WS_STATE_WAIT_FOR_REGISTRATION_RESPONSE
Received a message:HTTP/1.1 200 OK
Cache-Control: private
Server: Microsoft-IIS/8.5
SBI-Version: 3
SBI-Status: 11
SBI-HC: 0.134
X-Powered-By: ASP.NET
Date: Mon, 29 Feb 2016 15:49:16 GMT
Connection: close
Content-Length: 0

HTTP Status:200
WhiteSpace Status :11
Registration Failed
Registration HTTP Status:200 WS Error code:11
Error: HAAT ABOVE 250M
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
```

Figure8.12-2: Data log of unsuccessful registration with restricted HAAT location of master device



Date: 29.FEB.2016 14:57:28

Figure8.12-3: Unsuccessful registration with restricted HAAT location of slave device. Spectrum plot shows that prior to the unsuccessful registration the EUT was transmitting to connect to the master device and perform the initial registration request. Subsequently the transmission stopped once the database responded with no valid channels for the given location. For the convenience of the installer, the 6Harmonics GUI displays the error message "HAAT Above 250m".

```
steven — telnet 192.168.3.202 — 80x36
GWS Cmd > showregistration
...Registration Info...
URL:
tvws-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
45.3648
Longitude:
-121.6732
...Owner Info...
Owner:
6H
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@6harmonics.com
ContactTelephone:
6133661768
GWS Cmd >

Setting frequency to 587 MHz
setcontactc
setcontactcountry
setcontactcity ottawa
setcontactcountry
setchan 33
Setting frequency to 587 MHz
setcontactcountry CA
setcontactemail
setchan 33
Setting frequency to 587 MHz
setcontactemail info@6harmonics.com
setcontacttelephone
setchan 33
Setting frequency to 587 MHz
setcontacttelephone 6133661768
setchan 33
Setting frequency to 587 MHz
setlatitude 45.3648
setlongitude -121.6732

steven — telnet 192.168.3.202 — 80x24
---No station connected---
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:38:02:08:9E
14:32:59 up 33 min, load average: 0.45, 0.48, 0.48
MemFree: 38944 kB
Channel:
17
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
Channel Expire In NoValidChannel Minutes
Query Time Left In N/A Minutes

steven — telnet 192.168.3.202 — 80x33
8</ContactPhone><ContactState>ON</ContactState><ContactStreet>Suite 10-21 Concou
rse Gate </ContactStreet><ContactZip>K2E7S4</ContactZip><DeviceOwner>6H
</DeviceOwner><DeviceType>8</DeviceType><Latitude>45.3648</Latitude><Longi
tude>-121.6732</Longitude></RegistrationRequest>

Current WSAgent State: WS_STATE_WAIT_FOR_REGISTRATION_RESPONSE
Received a message:HTTP/1.1 200 OK
Cache-Control: private
Server: Microsoft-IIS/8.5
SBI-Version: 3
SBI-Status: 11
SBI-HC: 0.112
X-Powered-By: ASP.NET
Date: Mon, 29 Feb 2016 19:30:51 GMT
Connection: close
Content-Length: 0

HTTP Status:200
WhiteSpace Status :11
Registration Failed
Registration HTTP Status:200 WS Error code:11
Error: HAAT ABOVE 250M
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
Current WSAgent State: WS_STATE_IDLE
Current WSAgent State: WS_STATE_BACKGROUND_SCANNING
Current WSAgent State: WS_STATE_ASSOCIATING
Current WSAgent State: WS_STATE_OBTAINING_IP
Waiting for radio link up
```

Figure8.12-4: Data log of unsuccessful registration with restricted HAAT location of slave device

8.13 FCC15.713(e)(6) Unsuccessful registration due to antenna height that exceeds 30 m

8.13.1 Definitions and limits

A fixed device with an antenna height above ground that exceeds 30 meters or an antenna height above average terrain (HAAT) that exceeds 250 meters shall not be provided a list of available channels.

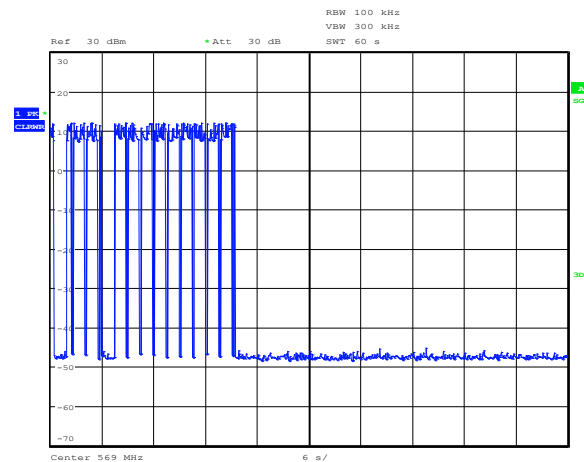
8.13.2 Test summary

Test date	February 29, 2016	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	32 %

8.13.3 Observations, settings and special notes

EUT was configured with information that included an antenna height that exceeded 30 m limit (input was 31 m). It was verified, that after database rejection, the EUT stopped the transmission. To test this feature the device was initially configured with valid information and allowed to transmit on the channel. The registration information was then modified to render it invalid and a registration request was re-initiated. Once the database responded with an empty channel list as a result of the antenna height above ground, the EUT stopped to transmit. For the master device, during the initial power up and registration, if the database returns an empty channel list, it will not turn on the transmitter. For the slave device, the EUT will perform a passive scan and will attempt to connect to a master device on a channel where it detects a beacon. Once connected it will attempt to register with the database for up to 1 minute. If the database responds with an empty channel list, or the device is unable to connect to the database, it will cease to transmit on the channel.

8.13.4 Test data



Date: 29.FEB.2016 11:17:53

Figure 8.13-1: Unsuccessful registration with restricted antenna height of master device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with an invalid antenna height, the transmission stopped once the database responded with no valid channels. For the convenience of the installer, the 6Harmonics GUI displays the error message "Antenna Height Above 30m".


```
steven — telnet 192.168.3.202 — 81x36
[GWS Cmd > showregistration
...Registration Info...
URL:
twvs-test.spectrumbridge.com
DeviceMode:
RegulatoryDomain:
AntennaHeight:
31
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
GH
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
Ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@6harmonics.com
ContactTelephone:
6133661768
GWS Cmd > ]

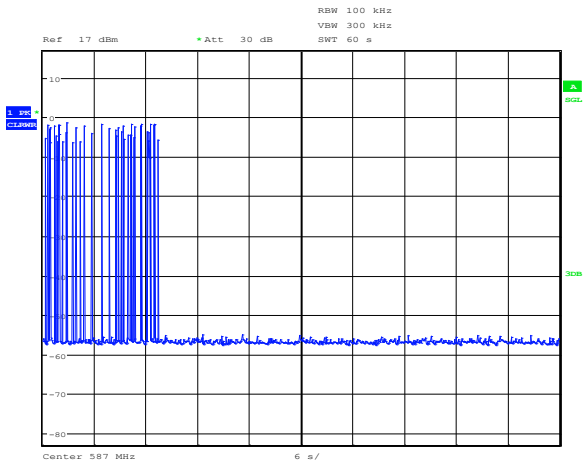
steven — telnet 192.168.3.202 — 80x24
---No station connected---
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWAddr AC:EE:3B:02:00:9E
10:52:39 up 1:01, load average: 0.53, 0.36, 0.32
MemFree: 38368 kB
Channel:
30
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
TX Down
]

steven — telnet 192.168.3.202 — 93x38
Registration Request Message:PUT https://twvs-test.spectrumbridge.com/v3/devices/US/2AASGWS-4006-23/620000096 HTTP/1.1
Host: twvs-test.spectrumbridge.com
Content-Type: Application/xml
Connection: close
Content-Length: 615

<RegistrationRequest xmlns="http://schemas.datacontract.org/2004/07/SpectrumBridge.WhiteSpace
s.Services.v3"><AntennaHeight>31</AntennaHeight><ContactCity>Ottawa </ContactCity><ContactCou
ntry>CA</ContactCountry><ContactEmail>info@6harmonics.com</ContactEmail><ContactName>info
</ContactName><ContactPhone>6133661768</ContactPhone><ContactState>ON</ContactState><Con
tactStreet>Suite 10-21 Concourses Gate </ContactStreet><ContactZip>K2E7S4</ContactZip><D
eviceOwner>GH </DeviceOwner><DeviceType>8</DeviceType><Latitude>44.429534</Latitude><
Longitude>-75.15075</Longitude></RegistrationRequest>

SECURE_SESSION_5
Current WSAgent State: WS_STATE_WAIT_FOR_REGISTRATION_RESPONSE
Received a message:HTTP/1.1 200 OK
Cache-Control: private
Server: Microsoft-IIS/8.5
SBI-Version: 3
SBI-Status: 10
SBI-HC: 0.000
X-Powered-By: ASP.NET
Date: Mon, 29 Feb 2016 15:52:39 GMT
Connection: close
Content-Length: 0
Status:200 WS Err
HTTP Status:200
WhiteSpace Status :10
Registration Failed
Registration HTTP Status:200 WS Error code:10
Error: ANTENNA_HEIGHT_ABOVE_30M
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
```

Figure8.13-2: Data log of unsuccessful registration with restricted antenna height of master device



Date: 29.FEB.2016 15:01:14

Figure8.13-3: Unsuccessful registration with antenna height of slave device. Spectrum plot shows that prior to the unsuccessful registration the EUT was transmitting to connect to the master device and perform the initial registration request. Subsequently the transmission stopped once the database responded with no valid channels as a result of the antenna height being above 30m. For the convenience of the installer, the 6Harmonics GUI displays the error message "Antenna Height Above 30m".

```
steven — telnet 192.168.3.202 — 80x36
GWS Cmd > showregistration
...Registration Info...
URL:
tvws-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
31
AntennaType:
AGL
RegulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
GH
Contactname:
info
ContactAddress:
Suite 10-21 Concourses Gate
ContactCity:
ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@gharmonics.com
ContactTelephone:
6133661768
GWS Cmd >

steven — telnet 192.168.3.202 — 80x24
---No station connected---
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:3B:02:08:9E
14:35:04 up 35 min, load average: 0.39, 0.50, 0.49
MemFree: 38568 kB
Channel:
40
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
Channel Expire In NoValidChannel Minutes
Query Time Left In N/A Minutes

steven — telnet 192.168.3.202 — 80x33
Cache-Control: private
Server: Microsoft-IIS/8.5
SBI-Version: 3
SBI-Status: 10
SBI-HC: 0.000
X-Powered-By: ASP.NET
Date: Mon, 29 Feb 2016 19:34:30 GMT
Connection: close
Content-Length: 0

HTTP Status:200
WhiteSpace Status:10
Registration Failed
Registration HTTP Status:200 WS Error code:10
Error: ANTENNA_HEIGHT_ABOVE_30M
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
Current WSAgent State: WS_STATE_IDLE
Current WSAgent State: WS_STATE_BACKGROUND_SCANNING
Current WSAgent State: WS_STATE_ASSOCIATING
Current WSAgent State: WS_STATE_OBTAINING_IP
Waiting for radio link up
snr=38
Radio link is up
Current WSAgent State: WS_STATE_SERVICE_RESOLUTION
Current WSAgent State: WS_STATE_REGISTRATION
Current WSAgent State: WS_STATE_WAIT_TO_ESTABLISH_SECURE_SESSION
get_ip at line 177 Host:tvws-test.spectrumbridge.com
Can't get IP: Success
***establishASecureSession() at line 340 clear shared memory***
Current WSAgent State: WS_STATE_REGISTRATION
Current WSAgent State: WS_STATE_WAIT_TO_ESTABLISH_SECURE_SESSION

Setting frequency to 587 MHz
setcontactcountry CA
setcontactemail
setchan 33
setcontactemail info@gharmonics.com
setcontacttelephone
setchan 33
Setting frequency to 587 MHz
setcontacttelephone 6133661768
setchan 33
Setting frequency to 587 MHz
setlatitude 45.3648
setlongitude -121.6732
setlatitude 44.429534
setlongitude -75.15075
setchan 33
Setting frequency to 587 MHz
setantennaheight 31
setchan 33
Setting frequency to 587 MHz
```

Figure8.13-4: Data log of unsuccessful registration with restricted antenna height of slave device

8.14 FCC15.713(g)(3)(i) and (ii) Unsuccessful registration due to incomplete information – FCC ID and Serial number

8.14.1 Definitions and limits

(3) The white space device registration database shall contain the following information for fixed white space devices:
 (i) FCC identifier (FCC ID) of the device;
 (ii) Manufacturer's serial number of the device

8.14.2 Test summary

Test date	February 29, 2016	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	32 %

8.14.3 Observations, settings and special notes

The registration interface does not contain a mechanism by which the serial number or the FCC ID of the radio can be changed. The FCC ID and serial number are flash programmed during the manufacturing process and could not be changed without being returned to the manufacturer.

8.15 FCC15.713(a)(3) Relocation of fixed TVBD

8.15.1 Definitions and limits

The white space database serves the following function:

(3) To register the identification information and location of fixed white space devices and unlicensed wireless microphone users.
The Data base will not provide a channel list for a fixed TVBD at a location other than that registered.

8.15.2 Test summary

Test date	February 29, 2016	Temperature	22 °C
Test engineer	Andrey Adelberg	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	32 %

8.15.3 Observations, settings and special notes

The implementation of the location input prevents the radio from requesting channels from another location other than the last successful registration. It is not possible for the user to input location information into the radio that would result in a channel request from a different location other than the current registration location. In the event of a change in the input location information, a new registration and channel request are sent using the same entered registration location information.

8.16 FCC15.711(c)(2)(iii) Fixed & Mode II TVDB database update

8.16.1 Definitions and limits

Each fixed white space device must access a white space database over the Internet to determine the available channels and the corresponding maximum permitted power for each available channel that is available at its geographic coordinates, taking into consideration the fixed device's antenna height above ground level and geo-location uncertainty, prior to its initial service transmission at a given location.

8.16.2 Test summary

Test date	March 1, 2016	Temperature	23 °C
Test engineer	Andrey Adelberg	Air pressure	1008 mbar
Verdict	Pass	Relative humidity	34 %

8.16.3 Observations, settings and special notes

EUT was configured with proper registration information and the successful registration was verified. The channel allocation was valid for 45 minutes. Then internet connection was blocked to EUT. After the time of channel allocation has passed it was verified that without database access the EUT stopped the transmission.

8.16.4 Test data

```
<Channels:15 19 20 35> > cs authpriv info dropbear[1552]: Exit (rout): Error read
read getchanbw is 5
chanbw == SSINGLE CHANNEL
cs authpriv info dropbear[15507]: Child connection from
15 19 20 35 0:56455
valid FCC number Of Chans=4 authpriv notice dropbear[15507]: Password auth success
TX State=GWS_Ready 192.168.3.189:56458
main() at line 234 ***current chan=35 (a dropbear[18471]: Child connection from
main line 254 current channel=35 within chanlist
main() at line 113 numOfChans=11 from Database (near[18471]: Password auth success
main() at line 116 refreshHrs=48 of database
main() at line 121 queryIntervalInMin = 1380 from agent[000] device wlan0 left at
current time=Tue Mar 1 09:49:39 2016
Tue Mar 1 09:49:40 @harmonics user warn syslog: ***chanlist from database expire in
chanlist time=Tue Mar 1 09:44:53 2016
Tue Mar 1 09:49:40 @harmonics user warn syslog: ***chanlist from database expire in
expire time=4904 current time=2029 minutes...reserved=0
Channel List Will expire in 2875 Minutes log: ***chanlist from database expire in
numOfChans=11 from Database : 0 Minutes...reserved=0
<Channels:15 19 20 35> > cs user warn syslog: ***chanlist from database expire in
read getchanbw is 5 (me left: 0 Minutes...reserved=0
chanbw == SSINGLE CHANNEL user warn syslog: ***chanlist from database expire in
15 19 20 35 (user Time Left: 0 Minutes...reserved=0
valid FCC number Of Chans=4 de
TX State=GWS_Ready
main() at line 234 ***current chan=35
main line 254 current channel=35 within chanlist
[] at @harmonics.ca

*****
No station connected
Database Access:spectrumbridge
Node is CAR With Ethernet MAC: Index of /-groza/EU Software Developer
HWaddr AC:EE:3B:02:00:87
09:49:43 up 1:44, load average: 0.03, 0.18, 0.21
MemFree: 488 39460 kB
Channel:
35 494
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
GWS_Ready
Channel Expire In 2876 Minutes
Query Time Left In 23 Minutes
518
524
530
536
542
548
554
```

Figure 8.16-1: Data log of successful registration and transmission within the allocated time with internet access of master device

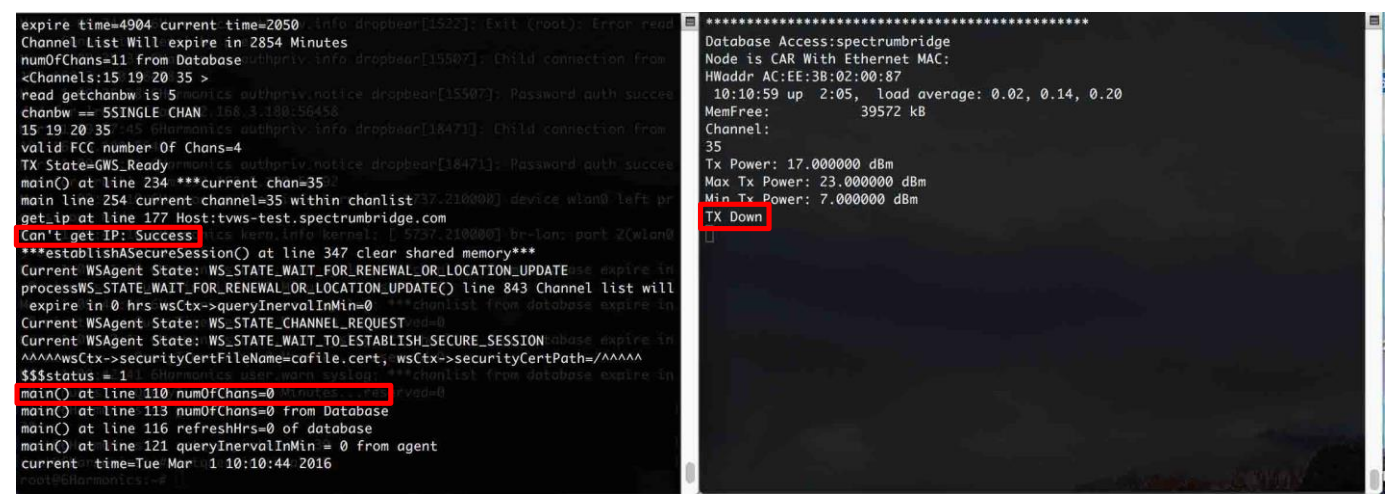


Figure 8.16-2: Data log of unsuccessful registration and transmission down after the allocated time with blocked internet access of master device

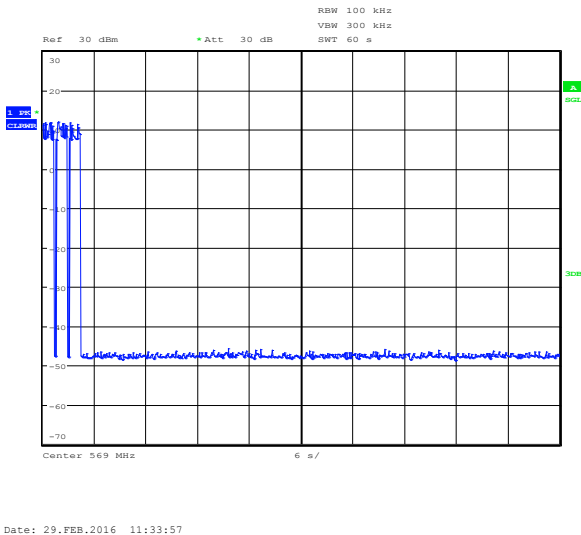


Figure 8.16-3: Transmission termination after the expiration of the allocated channel availability time of master device

```
Cache-Control: private
Content-Length: 285
Content-Type: application/xml; charset=utf-8
Server: Microsoft-IIS/8.5
SBI-Version: 3
SBI-Status: 0
X-Powered-By: ASP.NET
Date: Tue, 01 Mar 2016 15:33:37 GMT
Connection: close

<ChannelResponse xmlns="http://schemas.datacontract.org/2004/07/SpectrumBridge.WhiteSpaces.Services.v3" xmlns:i="http://www.w3.org/2001/XMLSchema-instance"><ChannelCount>12</ChannelCount><ChannelList>2,5,6,7,8,9,13,14,15,19,20,35</ChannelList><RefreshIn>1</RefreshIn></ChannelResponse>
HTTP Status:200
WhiteSpace Status :0
processWS_STATE_WAIT_FOR_CHANNEL_RESPONSE() line 655 wsCtx->queryIntervalInMin=30

Available Channels:<2 5 6 7 8 9 13 14 15 19 20 35 >
Channel Refresh In 1 Hrs
Get Channel list from Database...
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
Current WSAgent State: WS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE
chanList expire in 59 minutes... QueryTime Left: 9 Minutes...
```

```
Connected to ac:ee:3b:02:08:87
-34 dbm / -37 dbm (SNR 43) 270 ms ago
RX: 18.0 Mbit/s, MCS 7, short GI 3413 Pkts.
TX: 18.0 Mbit/s, MCS 7, short GI 395 Pkts.

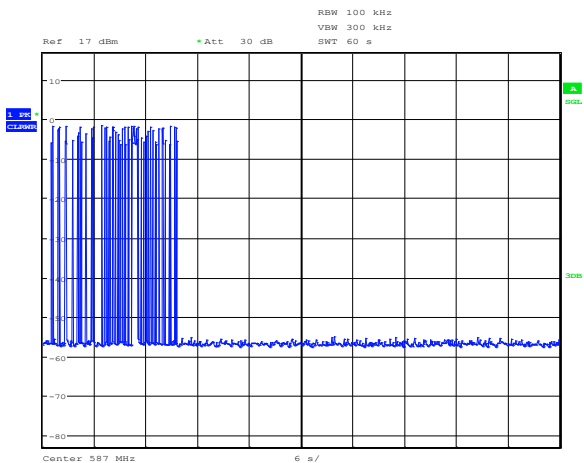
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:3B:02:08:9E
10:34:55 up 3 min, load average: 0.18, 0.18, 0.08
MemFree: 39376 kB
Channel:
19
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
Channel Expire In 59 Minutes
Query Time Left In 9 Minutes
Radio Link Up Time...
years - 0
months - 0
days - 0
clock - 0:1:51
```

Figure8.16-4: Data log of successful registration and transmission within the allocated time with internet access of master device

```
Available Channels:<2 5 6 7 8 9 13 14 15 19 20 35 >
Channel Refresh In 1 Hrs
Get Channel list from Database...
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
Current WSAgent State: WS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE
Current WSAgent State: WS_STATE_CHANNEL_REQUEST: 2 Minutes...
Current WSAgent State: WS_STATE_WAIT_TO_ESTABLISH_SECURE_SESSION
get_ip at line 177 Host:tvws-test.spectrumbridge.com
Can't get IP: Success
***establishASecureSession() at line 340 clear shared memory***
Current WSAgent State: WS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE
Current WSAgent State: WS_STATE_CHANNEL_REQUEST
Current WSAgent State: WS_STATE_WAIT_TO_ESTABLISH_SECURE_SESSION
get_ip at line 177 Host:tvws-test.spectrumbridge.com
Can't get IP: Success
***establishASecureSession() at line 340 clear shared memory***
Current WSAgent State: WS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE
```

```
*****
No station connected
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:3B:02:08:9E
10:44:12 up 12 min, load average: 0.56, 0.24, 0.15
MemFree: 39476 kB
Channel:
22
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
Channel Expire In NoValidChannel Minutes
Query Time Left In N/A Minutes
```

Figure8.16-5: Data log of unsuccessful registration and transmission down of slave device after the allocated time with blocked internet access of the master



Date: 29.FEB.2016 15:03:43

Figure8.16-5: Transmission termination after the expiration of the allocated channel availability time of slave device

8.17 FCC15.711(c)(2)(iii) Low-power auxiliary device protection

8.17.1 Definitions and limits

Each fixed white space devices shall access the database at least once a day to verify that the operating channels continue to remain available. Each fixed white space device must adjust its use of channels in accordance with channel availability schedule information provided by its database for the 48-hour period beginning at the time the device last accessed the database for a list of available channels.

Use of database protected entity interface to register protection for a low-power auxiliary device in the same location and channel which EUT has selected and operating. The registered protection for the low-power auxiliary device should be scheduled within the next 48-hour period.

8.17.2 Test summary

Test date	March 1, 2016	Temperature	23 °C
Test engineer	Andrey Adelberg	Air pressure	1008 mbar
Verdict	Pass	Relative humidity	34 %

8.17.3 Observations, settings and special notes

EUT was configured with proper registration information and the successful registration was verified. The channel expiration time for testing purposes was reduced to 60 minutes. Meantime it was scheduled with the WSDB that channel 35 would be registered for a low-power device. After the time of channel allocation of the EUT has passed it was verified that the EUT stopped the transmission on the temporarily restricted channel and removed this channel from the list channel.

8.17.4 Test data

```

Setting frequency to 599 MHz
configBTS() at line 412 ***current chan=35
configBTS line 432 current channel=35 within chanlist
Tx is on
chanlist expire in 59 minutes... QueryTime Left: 29 Minutes...main() at line 113
numOfChans=11 from Database
main() at line 116 refreshHrs=1 of database
main() at line 121 queryIntervalInMin = 30 from agent
current time=Tue Mar 1 12:48:04 2016

chanlist time=Tue Mar 1 12:46:48 2016
expire time=2266 current time=2208
Channel list Will expire in 58 Minutes
numOfChans=11 from Database
<Channels:14 15 20 35 >
read getchanbw is 5
chanbw == SINGLE CHAN
14 15 20 35
valid FCC number Of Chans=4
TX State=GWS_Ready
main() at line 234 ***current chan=35
main line 254 current channel=35 within chanlist

-----
---No station connected---
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:EE:3B:02:00:87
12:48:08 up 1:34, load average: 0.39, 0.29, 0.30
MemFree: 38024 kB
Channel: 35
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
GWS_Ready
Channel Expire In 59 Minutes
Query Time Left In 29 Minutes

```

Figure8.17-1: Data log of successful registration and transmission of master device within the allocated time at the channel 35. Allotted channel list includes these channels. Low-power device reserved channel 35 at 1:00 pm.

```

steven — telnet 192.168.3.201 — 80x24
valid FCC number Of Chans=4
TX State=GWS_Ready
main() at line 234 ***current chan=20
main line 254 current channel=20 within chanlist
chanlist expire in 2874 minutes... QueryTime Left: 9 Minutes...main() at line 11
3 numOfChans=11 from Database
main() at line 116 refreshHrs=48 of database
main() at line 121 queryIntervalInMin = 15 from agent
current time=Tue Mar 1 13:08:08 2016

chanlist time=Tue Mar 1 13:02:05 2016
expire time=5102 current time=2228
Channel List Will expire in 2874 Minutes
numOfChans=11 from Database
Channels:14 15 19 20 >
read getchanbw is >
chanbw == 55 SINGLE CHAN
14 15 19 20
valid FCC number Of Chans=4
TX State=GWS_Ready
main() at line 234 ***current chan=20
main line 254 current channel=20 within chanlist

steven — telnet 192.168.3.201 — 80x24
---No station connected---
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:FE:38:02:00:87
13:08:33 up 1:54, load average: 0.22, 0.23, 0.27
Mem-free: 39044 kB
Channel:
20
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
GWS_Ready
Channel Expire In 2874 Minutes
Query Time Left In 9 Minutes

```

Figure8.17-2: Data log of successful registration and transmission of master device now configured to transmit on channels 20 after registration of the low power device on channel 35. Channel 35 was excluded from the newly accepted channel list after 1:00 pm.

```

Cache-Control: private
Content-Length: 285
Content-Type: application/xml; charset=utf-8
Server: Microsoft-IIS/8.5
SBI-Version: 3
SBI-Status: 0
X-Powered-By: ASP.NET
Date: Wed, 02 Mar 2016 15:51:13 GMT
Connection: close

<ChannelResponse xmlns="http://schemas.datacontract.org/2004/07/SpectrumBridge.W
hiteSpaces.Services.v3" xmlns:i="http://www.w3.org/2001/XMLSchema-instance"><Cha
nnelCounts>12</ChannelCounts><ChannelList>2,5,6,7,8,9,13,14,15,19,20,35</ChannelLi
st><RefreshIn>1</RefreshIn></ChannelResponse>
HTTP Status:200
WhiteSpace Status :0
processWS_STATE_WAIT_FOR_CHANNEL_RESPONSE() line 655 wsCtx->queryIntervalInMin=30

Available Channels:2 5 6 7 8 9 13 14 15 19 20 35 >
Channel Refresh In 1 Hrs
Get Channel list from Database...
Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN
Current WSAgent State: WS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE
chanlist expire in 52 minutes... QueryTime Left: 2 Minutes...

Connected to ac:ee:3b:02:08:87
-61 dBm / -96 dBm (SNR 35) 30 ms ago
RX: 18.0 MBit/s, MCS 7, short GI 35096 Pkts.
TX: 18.0 MBit/s, MCS 7, short GI 14216 Pkts.

Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:3B:02:08:9E
10:59:53 up 19:37, load average: 0.10, 0.18, 0.16
Mem-free: 39740 kB
Channel:
19
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
Channel Expire In 52 Minutes
Query Time Left In 2 Minutes
Radio Link Up Time...
years - 0
months - 0
days - 0
clock - 0:15:9

```

Figure8.17-3: Data log of successful registration and transmission of slave device within the allocated time at the channel 19. Allotted channel list includes these channels. Low-power device reserved channel 19 at 11:00 am.

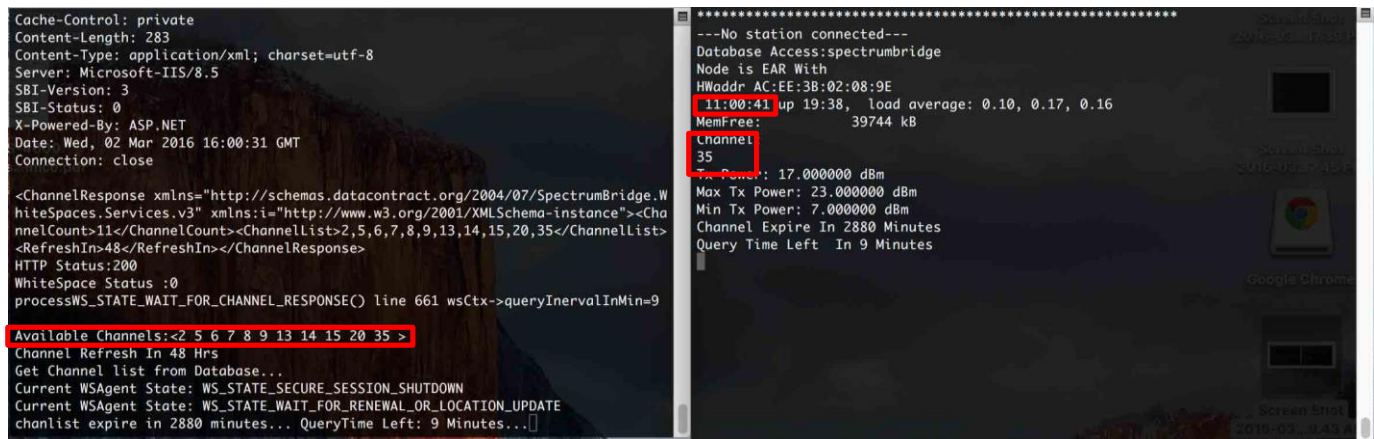


Figure8.17-4: Data log of successful registration and slave device start transmission on channel 35 after registration of the channel 19 for low-power device. Channel 19 was excluded from the newly accepted channel list after 11:00 am

8.18 FCC15.711(j) Security

8.18.1 Definitions and limits

White space devices shall incorporate adequate security measures to ensure that they are capable of communicating for purposes of obtaining lists of available channels only with databases operated by administrators authorized by the Commission, and to ensure that communications between white space devices and databases are secure to prevent corruption or unauthorized interception of data. This requirement includes implementing security for communications between Mode I personal portable devices and fixed or Mode II devices for purposes of providing lists of available channels. This requirement applies to communications of channel availability and other spectrum access information between the databases and fixed and Mode II devices (it is not necessary for white space devices to apply security coding to channel availability and channel access information where they are not the originating or terminating device and that they simply pass through).

8.18.2 Test summary

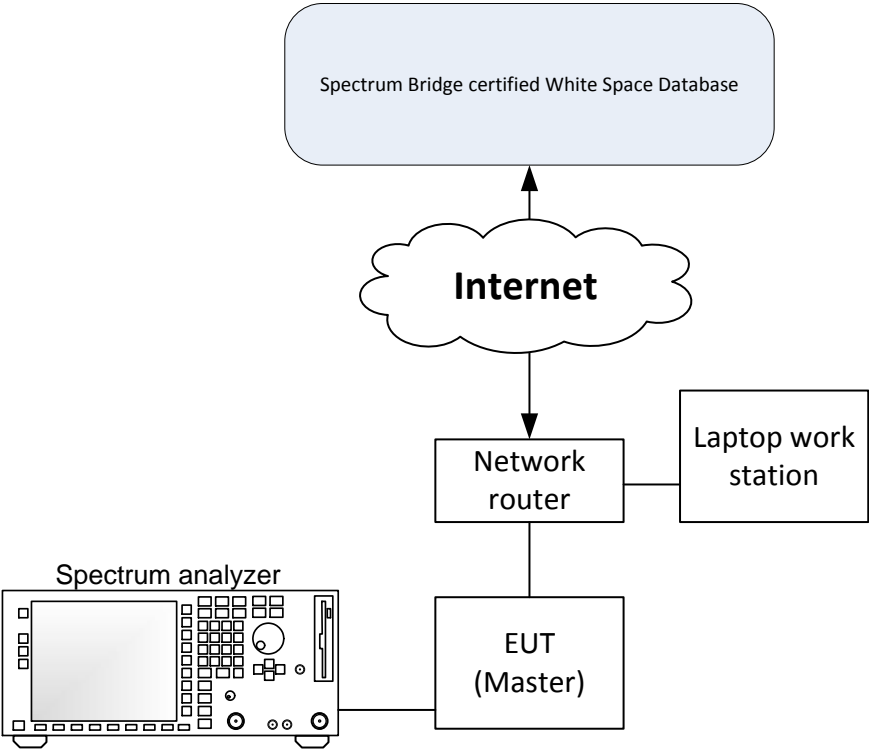
Test date	March 1, 2016	Temperature	23 °C
Test engineer	Andrey Adelberg	Air pressure	1008 mbar
Verdict	Pass	Relative humidity	34 %

8.18.3 Observations, settings and special notes

Please see the attached document:6H SBI Secure Communications Cert-4006-23.pdf

Section 9. Block diagrams of test set-ups

9.1 Master test setup diagram



9.2 Slave test setup diagram

