

8.8 FCC 15.713(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

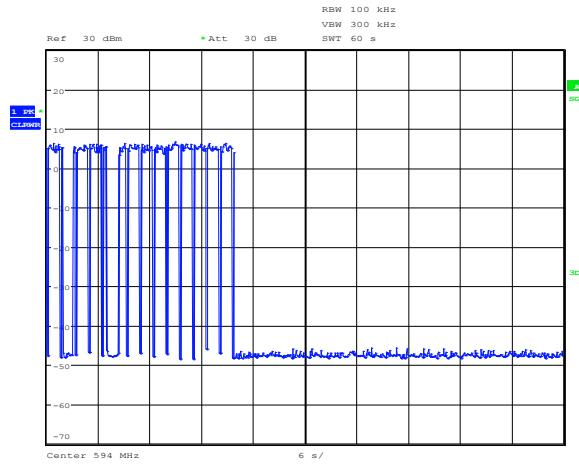
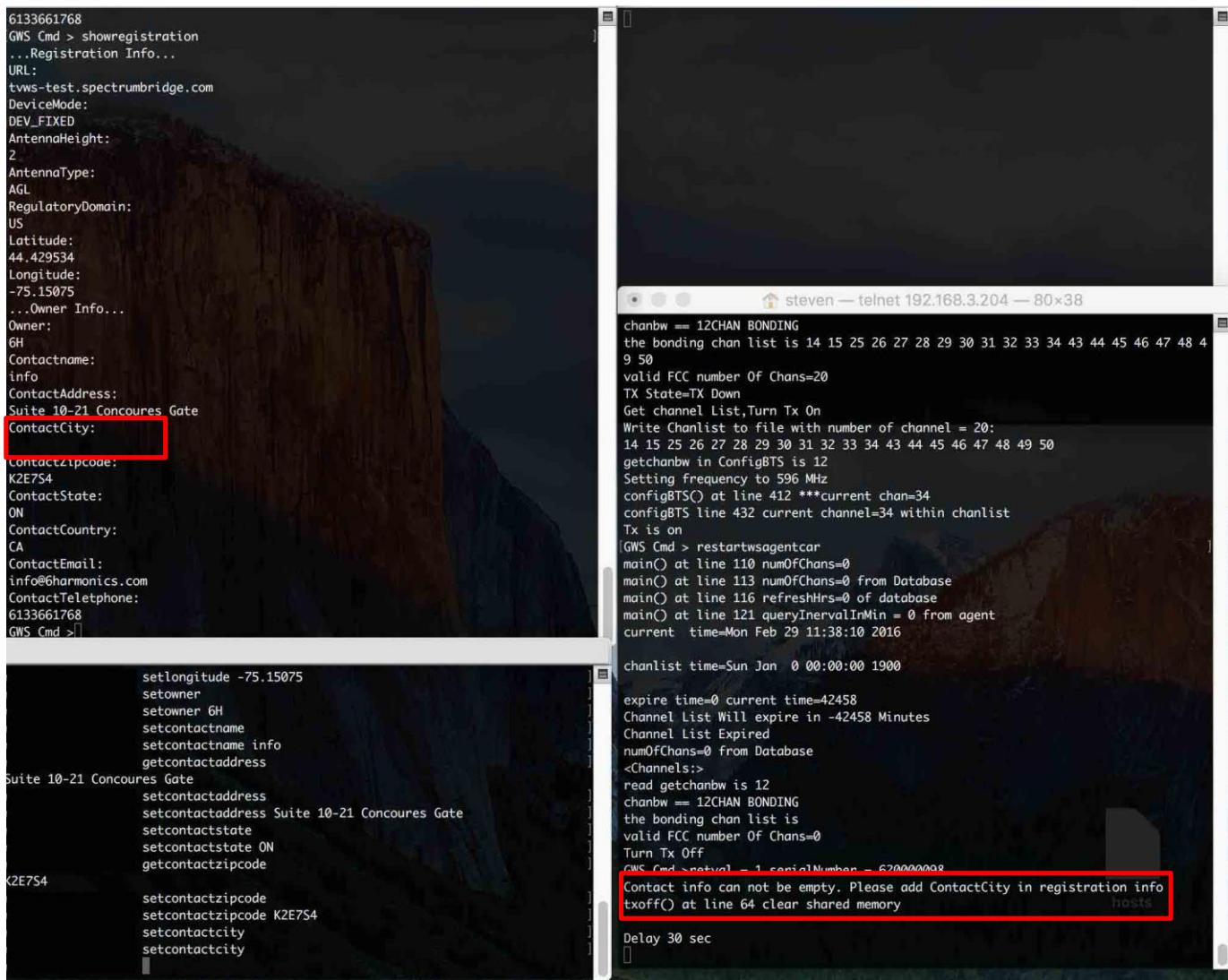


Figure 8.8-1: EUT was configured with incomplete information: contact city field was left intentionally blank (instead of Ottawa). It was verified, that after detecting missing contact information, EUT did not send any form request to database, the EUT stopped the transmission. To test this feature the 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.



```
6133661768
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 Concours Gate
ContactCity: [REDACTED]
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@harmonics.com
ContactTelephone:
6133661768
GWS Cmd >[REDACTED]

setlongitude -75.15075
setowner
setowner 6H
setcontactname
setcontactname info
getcontactaddress
Suite 10-21 Concours Gate
setcontactaddress
setcontactaddress Suite 10-21 Concours Gate
setcontactstate
setcontactstate ON
getcontactzipcode
K2E7S4
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity
setcontactcity

chanbw == 12CHAN BONDING
the bonding chan list is 14 15 25 26 27 28 29 30 31 32 33 34 43 44 45 46 47 48 49 50
valid FCC number Of Chans=20
TX State=TX Down
Get channel List,Turn Tx On
Write Chanlist to file with number of channel = 20:
14 15 25 26 27 28 29 30 31 32 33 34 43 44 45 46 47 48 49 50
getchanbw in ConfigBTS is 12
Setting frequency to 596 MHz
configBTS() at line 412 ***current chan=34
configBTS line 432 current channel=34 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 11:38:10 2016

chanlist time=Sun Jan 0 00:00:00 1900
expire time=0 current time=42458
Channel List Will expire in -42458 Minutes
Channel List Expired
numOfChans=0 from Database
<Channels:>
read getchanbw is 12
chanbw == 12CHAN BONDING
the bonding chan list is
valid FCC number Of Chans=0
Turn Tx Off
GWS Cmd > serial1 = 1 serialNumber = 6200000002
Contact info can not be empty. Please add ContactCity in registration info
txoff() at line 64 clear shared memory [REDACTED]
hosts
Delay 30 sec
```

Figure 8.8-2: Data log of unsuccessful registration with missing contact city of master device

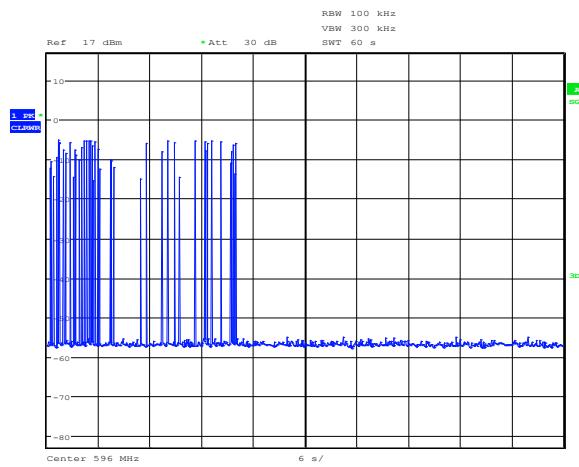
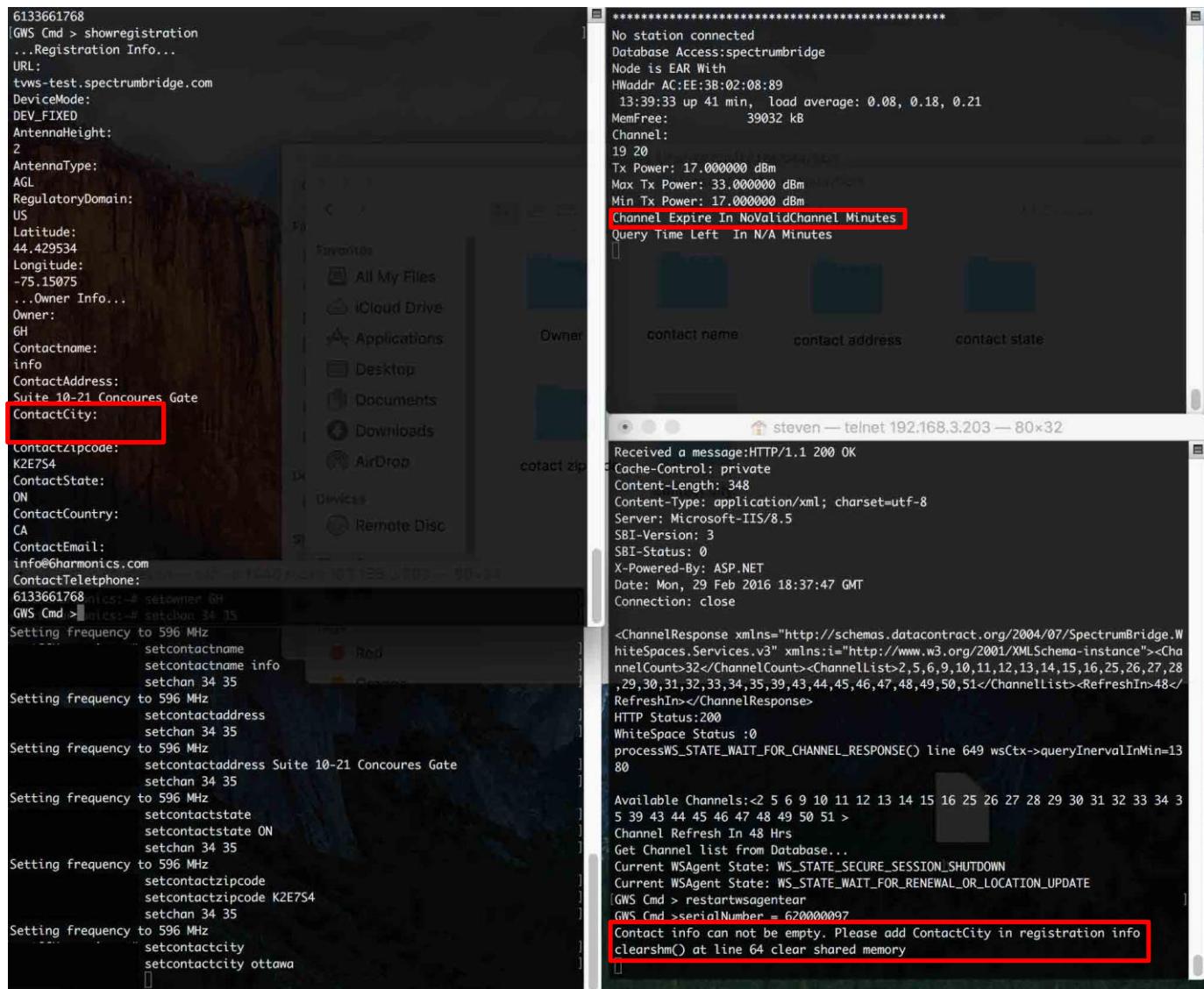


Figure 8.8-3: Unsuccessful registration with missing contact city of slave device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with invalid data the transmission 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.



6133661768
[GWS Cmd > showregistration
...Registration Info...
URL:
tws-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:
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@Gharmonics.com
ContactTelephone:
6133661768
GWS Cmd >| nics1:~ setowner GH
Setting frequency to 596 MHz
| setcontactname
| setcontactname info
| setchan 34 35
Setting frequency to 596 MHz
| setcontactaddress
| setchan 34 35
Setting frequency to 596 MHz
| setcontactaddress Suite 10-21 Concours Gate
| setchan 34 35
Setting frequency to 596 MHz
| setcontactstate
| setcontactstate ON
| setchan 34 35
Setting frequency to 596 MHz
| setcontactzipcode
| setcontactzipcode K2E7S4
| setchan 34 35
Setting frequency to 596 MHz
| setcontactcity
| setcontactcity ottawa

No station connected
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:3B:02:08:89
13:39:33 up 41 min, load average: 0.08, 0.18, 0.21
MemFree: 39032 kB
Channel:
19 20
Tx Power: 17.000000 dBm
Max Tx Power: 33.000000 dBm
Min Tx Power: 17.000000 dBm
Channel Expire In NoValidChannel Minutes
Query Time Left In N/A Minutes

Received a message:HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 348
Content-Type: application/xml; charset=utf-8
Server: Microsoft-IIS/8.5
SBI-Version: 3
SBI-Status: 0
X-Powered-By: ASP.NET
Date: Mon, 29 Feb 2016 18:37:47 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"><Ch
annelCount>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->queryInervalInMin=13
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 = 620000097
Contact info can not be empty. Please add ContactCity in registration info
clearshmC at line 64 clear shared memory

Figure 8.8-4: Data log of unsuccessful registration with missing contact city of slave device

8.9 FCC 15.713(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

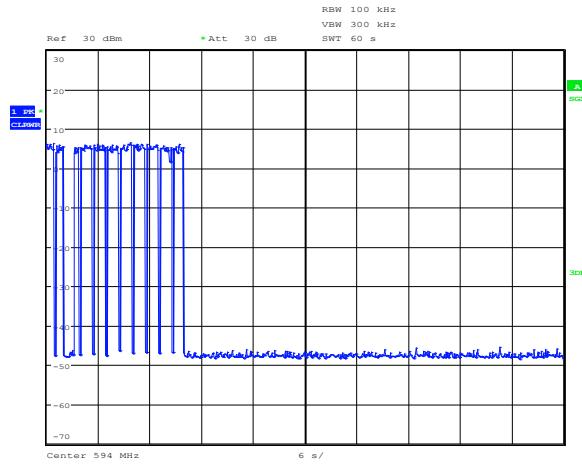
8.9.2 Test summary

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 12:06:21

Figure 8.9-1: 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.

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

setowner 6H
setcontactname
setcontactname info
getcontactaddress
Suite 10-21 Concours Gate
setcontactaddress
setcontactaddress Suite 10-21 Concours Gate
setcontactstate
setcontactstate ON
getcontactzipcode

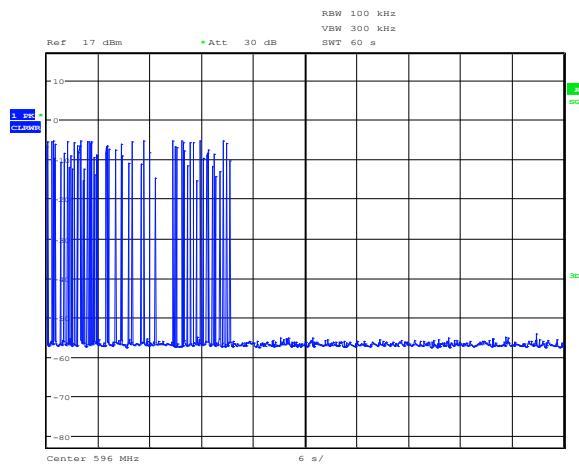
K2E7S4
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity
setcontactcity
setcontactcity ottawa
setcontactcountry

Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:EE:3B:02:00:88
11:40:05 up 23 min, load average: 0.30, 0.26, 0.17
MemFree: 39304 kB
Channel:
34 35
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
TX Down
ContactState

steven — telnet 192.168.3.204 — 80x38
chanbw == 12CHAN BONDING
the bonding chan list is 14 15 25 26 27 28 29 30 31 32 33 34 43 44 45 46 47 48 49 50
valid FCC number Of Chans=20
TX State=TX Down
Get channel List,Turn Tx On
Write Chanlist to file with number of channel = 20:
14 15 25 26 27 28 29 30 31 32 33 34 43 44 45 46 47 48 49 50
getchanbw in ConfigBTS is 12
Setting frequency to 596 MHz
configBTS() at line 412 ***current chan=34
configBTS line 432 current channel=34 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 refreshHhrs=0 of database
main() at line 121 queryIntervalInMin = 0 from agent
current time=Mon Feb 29 11:39:49 2016

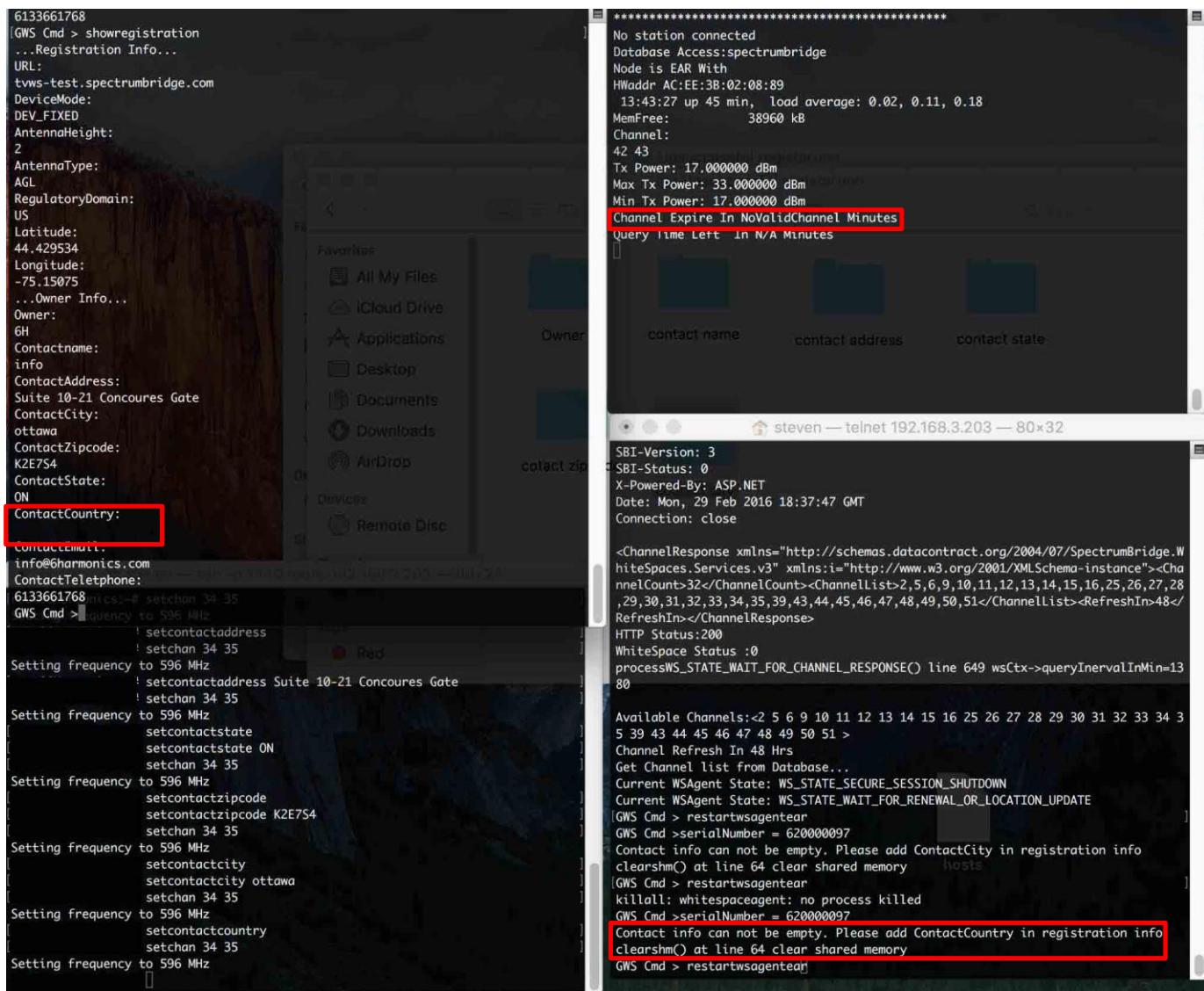
chanlist time=Sun Jan 0 00:00:00 1900
expire time=0 current time=42459
Channel List Will expire in -42459 Minutes
Channel List Expired
numOfChans=0 from Database
<Channels:>
[GWS Cmd >read getchanbw is 12
chanbw == 12CHAN BONDING
the bonding chan list is
valid FCC number Of Chans=0
Turn Tx Off
retval = 1 serialNumber = 620000098
Contact info can not be empty. Please add ContactCountry in registration info
txoff() at line 64 clear shared memory
Hosts
Delay 30 sec

Figure 8.9-2: Data log of unsuccessful registration with missing contact country of master device



Date: 29.FEB.2016 14:09:12

Figure 8.9-3: 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.



6133661768
[GWS Cmd > showregistration
...Registration Info...
URL:
tws-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 Concours Gate
ContactCity:
ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
[redacted]
ContactEmail:
info@6harmonics.com
ContactTelephone:
6133661768
GWS Cmd > frequency to 596 MHz
: setcontactaddress
: setchan 34 35
Setting frequency to 596 MHz
: setcontactaddress Suite 10-21 Concours Gate
: setchan 34 35
Setting frequency to 596 MHz
: setcontactstate
: setcontactstate ON
: setchan 34 35
Setting frequency to 596 MHz
: setcontactzipcode
: setcontactzipcode K2E7S4
: setchan 34 35
Setting frequency to 596 MHz
: setcontactcity
: setcontactcity ottawa
: setchan 34 35
Setting frequency to 596 MHz
: setcontactcountry
: setchan 34 35
Setting frequency to 596 MHz
[redacted]

No station connected
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:3B:02:08:89
13:43:27 up 45 min, load average: 0.02, 0.11, 0.18
MemFree: 38960 kB
Channel:
42 43
Tx Power: 17.000000 dBm
Max Tx Power: 33.000000 dBm
Min Tx Power: 17.000000 dBm
Channel Expire In NoValidChannel Minutes
Query time left In N/A Minutes

contact name contact address contact state

steven — telnet 192.168.3.203 — 80x32
SBI-Version: 3
SBI-Status: 0
X-Powered-By: ASP.NET
Date: Mon, 29 Feb 2016 18:37:47 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"><Ch
annelCount>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->queryInervalInMin=13
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 > restartwsagent
GWS Cmd >serialNumber = 620000097
Contact info can not be empty. Please add ContactCity in registration info
clearshm() at line 64 clear shared memory
[GWS Cmd > restartwsagent
killall: whitespaceagent: no process killed
GWS Cmd >serialNumber = 620000097
Contact info can not be empty. Please add ContactCountry in registration info
clearshm() at line 64 clear shared memory
[GWS Cmd > restartwsagent
hosts

Figure 8.9-4: Data log of unsuccessful registration with missing contact country of slave device

8.10 FCC 15.713(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

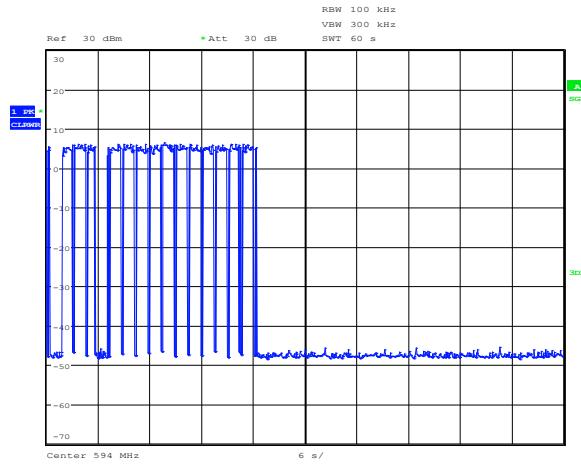
8.10.2 Test summary

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

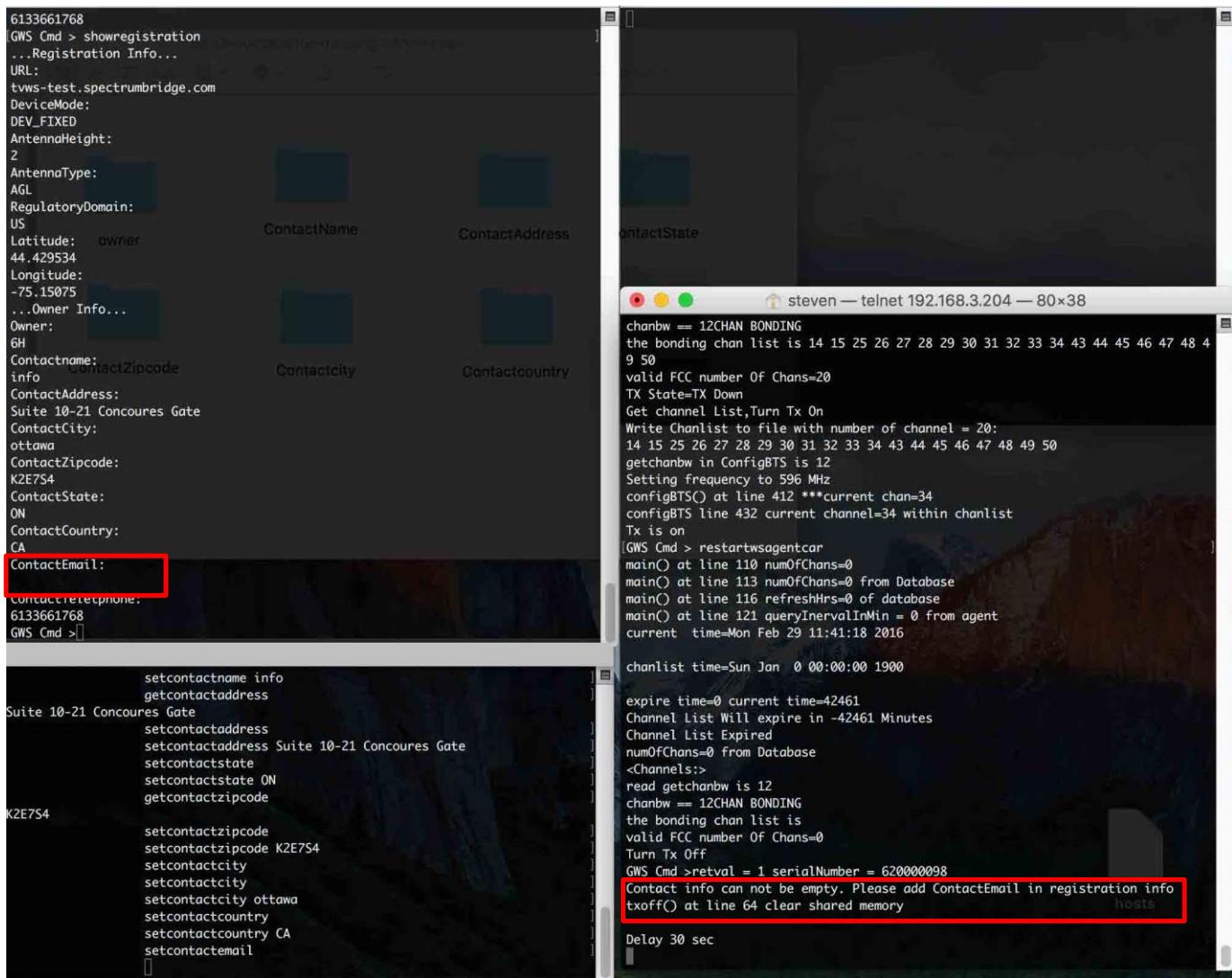
EUT was configured with incomplete information: contact email field was left intentionally blank (instead of info@6harmonics.com). It was verified, that after detecting missing contact information, EUT did not send any form request to database, the EUT stopped the transmission. To test this feature the 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 12:07:23

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.



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

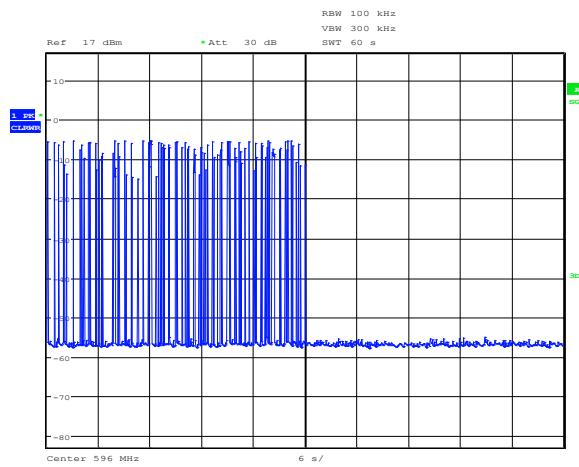
setcontactname info
getcontactaddress
Suite 10-21 Concours Gate
setcontactaddress
setcontactaddress Suite 10-21 Concours Gate
setcontactstate
setcontactstate ON
getcontactzipcode
K2E7S4
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity
setcontactcity
setcontactcity ottawa
setcontactcity
setcontactcountry
setcontactcountry CA
setcontactemail

chanbw == 12CHAN BONDING
the bonding chan list is 14 15 25 26 27 28 29 30 31 32 33 34 43 44 45 46 47 48 49 50
valid FCC number Of Chans=20
TX State=TX Down
Get channel List,Turn Tx On
Write ChanList to file with number of channel = 20:
14 15 25 26 27 28 29 30 31 32 33 34 43 44 45 46 47 48 49 50
getchanbw in ConfigBTS is 12
Setting frequency to 596 MHz
configBTS() at line 412 ***current chan=34
configBTS line 432 current channel=34 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 queryIntervalMin = 0 from agent
current time=Mon Feb 29 11:41:18 2016

chanlist time=Sun Jan 0 00:00:00 1900
expire time=0 current time=42461
Channel List Will expire in -42461 Minutes
Channel List Expired
numOfChans=0 from Database
<Channels>
read getchanbw is 12
chanbw == 12CHAN BONDING
the bonding chan list is
valid FCC number Of Chans=0
Turn Tx Off
[GWS Cmd >retval = 1 serialNumber = 620000098
Contact info can not be empty. Please add ContactEmail in registration info
txoff() at line 64 clear shared memory
hosts

Delay 30 sec
```

Figure 8.10-2: Data log of unsuccessful registration with missing contact email of master device



Date: 29.FEB.2016 14:11:08

Figure 8.10-3: 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.

```
6133661768
|GWS Cmd > showregistration
...Registration Info...
URL:
tws-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 Concours Gate
ContactCity:
ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail: [REDACTED]
ContactTelephone:
6133661768
Setting frequency to 596 MHz
|GWS Cmd > [REDACTED] -W setcontactaddress Suite 10-21 Concours Gate
          setchan 34 35
Setting frequency to 596 MHz
          setcontactstate
          setcontactstate ON
          setchan 34 35
Setting frequency to 596 MHz
          setcontactzipcode
          setcontactzipcode K2E7S4
          setchan 34 35
Setting frequency to 596 MHz
          setcontactcity
          setcontactcity ottawa
          setchan 34 35
Setting frequency to 596 MHz
          setcontactcountry
          setchan 34 35
Setting frequency to 596 MHz
          setcontactcountry CA
          setcontactemail
          setchan 34 35
Setting frequency to 596 MHz
          [REDACTED]
```

Figure 8.10-4: Data log of unsuccessful registration with missing contact email of slave device

8.11 FCC 15.713(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

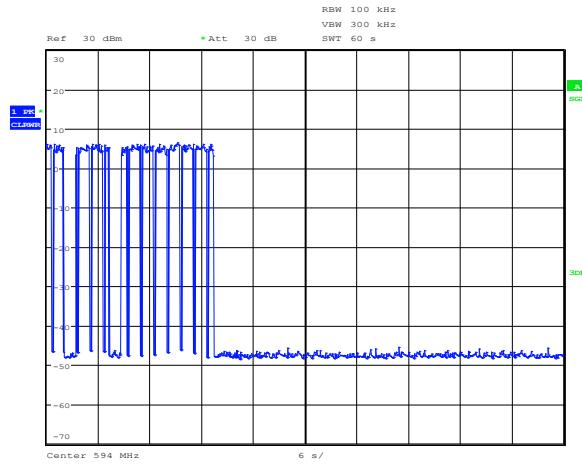
8.11.2 Test summary

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

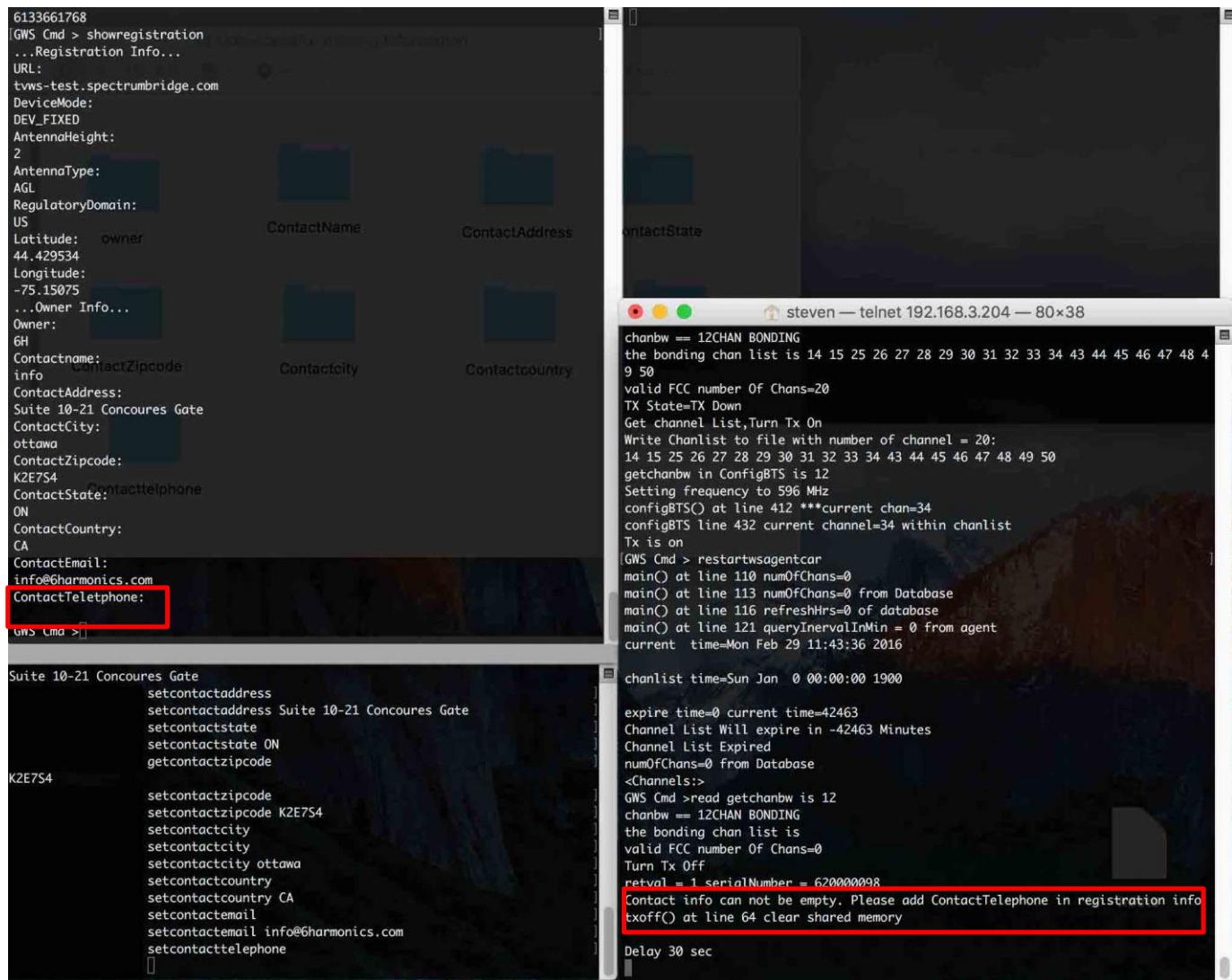
.EUT was configured with incomplete information: contact telephone field was left intentionally blank (instead of 6133661768). It was verified, that after detecting missing contact information, EUT did not send any form request to database, the EUT stopped the transmission. To test this feature the device 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 12:09:49

Figure 8.11-1: 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.



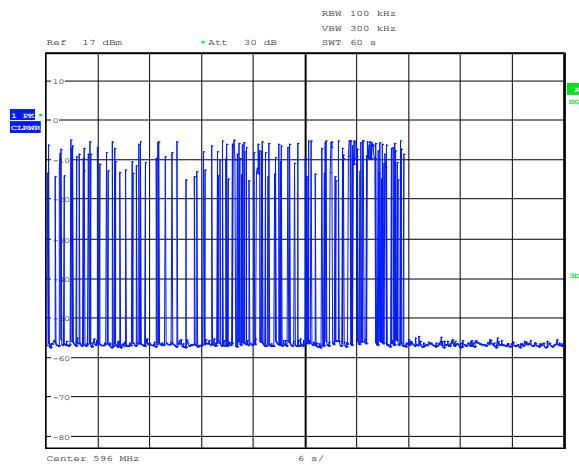
6133661768
[GWS Cmd > showregistration
...Registration Info...
URL:
tws-test.spectrumbridge.com
DeviceMode:
DEV_FIXED
AntennaHeight:
2
AntennaType:
AGL
RegulatoryDomain:
US
Latitude: owner
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
6H
Contactname:
info ContactZipcode
ContactAddress:
Suite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

Suite 10-21 Concours Gate
setcontactaddress
setcontactaddress Suite 10-21 Concours Gate
setcontactstate
setcontactstate ON
getcontactzipcode
K2E7S4
setcontactzipcode
setcontactzipcode K2E7S4
setcontactcity
setcontactcity
setcontactcity ottawa
setcontactcountry
setcontactcountry CA
setcontactemail
setcontactemail info@6harmonics.com
setcontacttelephone

chanbw == 12CHAN BONDING
the bonding chan list is 14 15 25 26 27 28 29 30 31 32 33 34 43 44 45 46 47 48 49 50
valid FCC number Of Chans=20
TX State=Tx Down
Get channel List,Turn Tx On
Write Chanlist to file with number of channel = 20:
14 15 25 26 27 28 29 30 31 32 33 34 43 44 45 46 47 48 49 50
getchanbw in ConfigBTS is 12
Setting frequency to 596 MHz
configBTSQ at line 412 ***current chan=34
configBTS line 432 current channel=34 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 11:43:36 2016

chanlist time=Sun Jan 00:00:00 1900
expire time=0 current time=42463
Channel List Will expire in -42463 Minutes
Channel List Expired
numOfChans=0 from Database
<Channels:>
GWS Cmd >read getchanbw is 12
chanbw == 12CHAN BONDING
the bonding chan list is
valid FCC number Of Chans=0
Turn Tx Off
retval = 1 serialNumber = 620000098
Contact info can not be empty. Please add ContactTelephone in registration info
txoff() at line 64 clear shared memory

Figure 8.11-2: Data log of unsuccessful registration with missing contact telephone of master device



Date: 29.FEB.2016 14:12:55

Figure 8.11-3: 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.

```

6133661768
[GWS Cmd > showregistration
...Registration Info...
URL:
tws-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 Concours Gate
ContactCity:
ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@6harmonics.com
ContactTelephone: [REDACTED]

[GWS Cmd > serialNumber = 620000097
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 = 620000097
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 = 620000097
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 = 620000097
Contact info can not be empty. Please add ContactTelephone in registration info
clearshm() at line 64 clear shared memory

*****  

No station connected  

Database Access:spectrumbridge  

Node is EAR With  

HWaddr AC:EE:3B:02:08:89  

13:47:04 up 49 min, load average: 0.48, 0.29, 0.24  

MemFree: 38988 kB  

Channel:  

41 42  

Tx Power: 17.000000 dBm  

Max Tx Power: 33.000000 dBm  

Min Tx Power: 17.000000 dBm  

Channel Expire In NoValidChannel Minutes  

query time left in N/A Minutes

```

Figure 8.11-4: Data log of unsuccessful registration with missing contact telephone of slave device

8.12 FCC 15.713(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

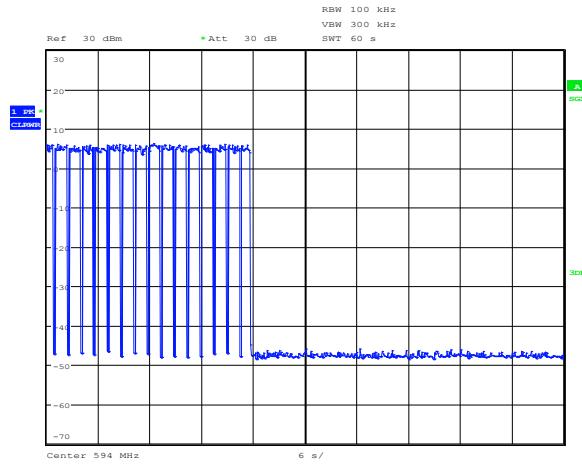


Figure 8.12-1: Unsuccessful registration with restricted HAAT location of master device. Spectrum plot shows that prior to the unsuccessful registration the EUT had been configured with valid information and was transmitting. Subsequently when a registration request was initiated with geolocation which 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".

GWS Cmd > showregistration

...Registration Info...

URL: tws-test.spectrumbridge.com

DeviceMode: DEV_FIXED

AntennaHeight: 2

AntennaType: AGL

RegulatoryDomain: US

Latitude: owner 45.3648

Longitude: -121.6732

...Owner Info...

Owner: 6H

Contactname: ContactZipcode info

ContactAddress: Suite 10-21 Concours Gate

ContactCity: ottawa

ContactZipcode: K2E7S4

ContactState: ContactTelephone

ON

ContactCountry: CA

ContactEmail: info@6harmonics.com

ContactTelephone: 6133661768

GWS Cmd >

setcontactzipcode

setcontactzipcode K2E7S4

setcontactcity

setcontactcity

setcontactcity ottawa

setcontactcountry

setcontactcountry CA

setcontactemail

setcontactemail info@6harmonics.com

setcontacttelephone

setcontacttelephone 6133661768

getlatitude

44.429534

getlongitude

-75.15075

setlatitude 45.3648

setlongitude -121.6732

Database Access:spectrumbridge

Node is CAR With Ethernet MAC:

HWaddr AC:EE:3B:02:00:88

11:46:10 up 29 min, load average: 0.19, 0.23, 0.20

MemFree: 38732 kB

Channel:

34 35

Tx Power: 17.000000 dBm

Max Tx Power: 23.000000 dBm

Min Tx Power: 7.000000 dBm

TX Down

ContactState

steven — telnet 192.168.3.204 — 80x38

/US/2AASTGWS-4012-23/620000098 HTTP/1.1

Host: tws-test.spectrumbridge.com

Content-Type: Application/xml

Connection: close

Content-Length: 611

<RegistrationRequest xmlns="http://schemas.datacontract.org/2004/07/SpectrumBridge.WhiteSpaces.Services.v3"><AntennaHeight>2</AntennaHeight><ContactCity>ottawa</ContactCity><ContactCountry>CA</ContactCountry><ContactEmail>info@6harmonics.com</ContactEmail><ContactName>info</ContactName><ContactPhone>6133661768</ContactPhone><ContactState>ON</ContactState><ContactStreet>Suite 10-21 Concours Gate</ContactStreet><ContactZip>K2E7S4</ContactZip><DeviceOwner>6H</DeviceOwner><DeviceType>8</DeviceType><Latitude>45.3648</Latitude><Longitude>-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: 0.115

X-Powered-By: ASP.NET

Date: Mon, 29 Feb 2016 16:46:04 GMT

Connection: close

Content-Length: 0

HTTP Status:200

WhiteSpace Status :11

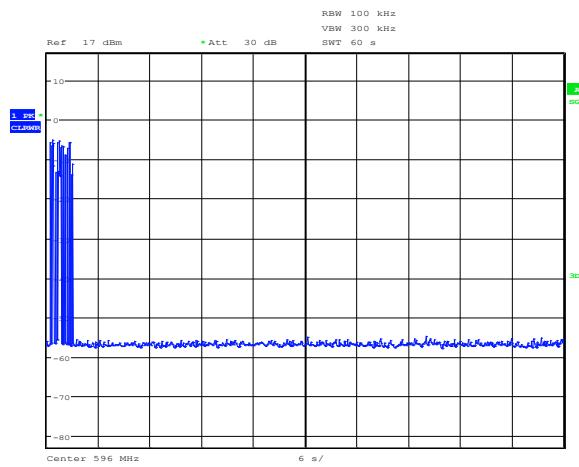
Registration Failed

Registration HTTP Status:200 WS_Error code:11

Error: HAAT ABOVE 250M

Current WSAgent State: WS_STATE_SECURE_SESSION_SHUTDOWN

Figure 8.12-2: Data log of unsuccessful registration with restricted HAAT location of master device



Date: 29.FEB.2016 14:15:59

Figure 8.12-3: 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".

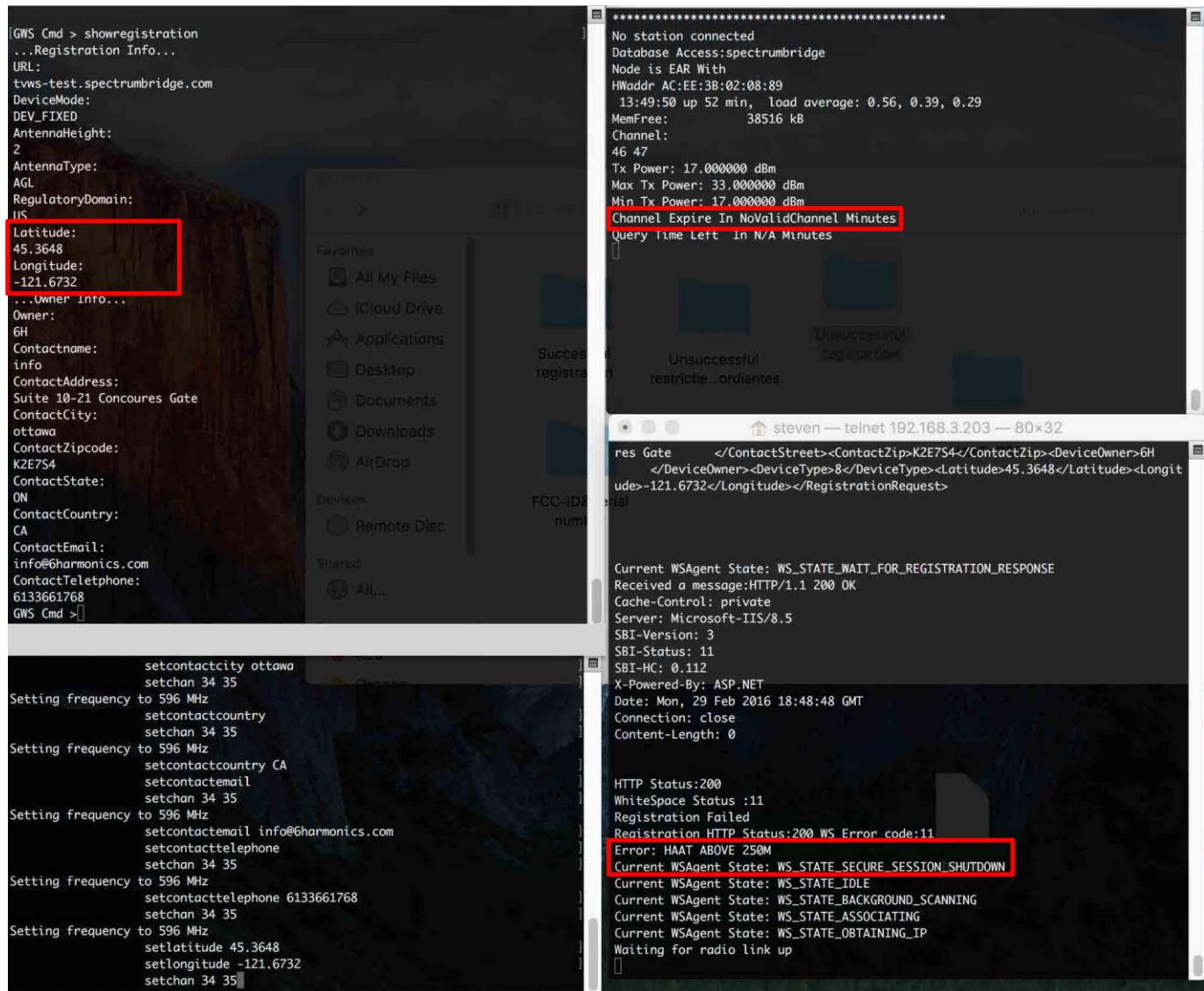


Figure 8.12-4: Data log of unsuccessful registration with restricted HAAT location of slave device

8.13 FCC 15.713(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.

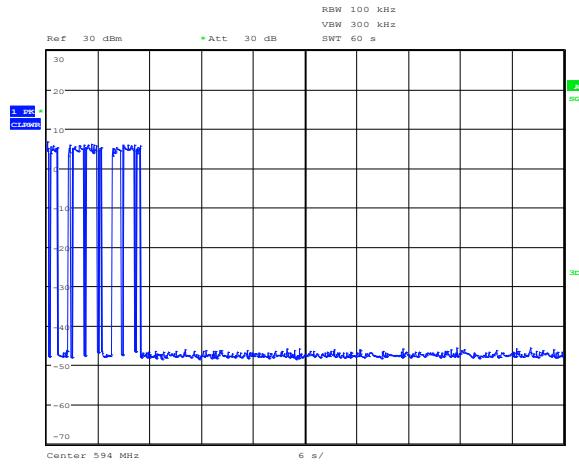
8.13.2 Test summary

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 12:14:06

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".

6133661768
|GWS Cmd > showregistration
...Registration Info...
URL:
tws-test.spectrumbridge.com
DeviceMode:
DEV_FTXFD
AntennaHeight:
31
AntennaType:
AGL
RegulatoryDomain:
US
Latitude: owner
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
6H
Contactname:
info ContactZipcode
ContactAddress:
Suite 10-21 Concours Gate
ContactCity:
ottawa
ContactZipcode:
K2E7S4
ContactState:
ContactTelephone:
ON
ContactCountry:
CA
ContactEmail:
info@6harmonics.com
ContactTelephone:
6133661768
GWS Cmd >

	ContactName	ContactAddress	ContactCity	ContactCountry
AntennaHeight:				
31				
AntennaType:				
AGL				
RegulatoryDomain:				
US				
Latitude:	owner			
44.429534				
Longitude:				
-75.15075				
...Owner Info...				
Owner:				
6H				
Contactname:				
info ContactZipcode				
ContactAddress:				
Suite 10-21 Concours Gate				
ContactCity:				
ottawa				
ContactZipcode:				
K2E7S4				
ContactState:				
ContactTelephone:				
ON				
ContactCountry:				
CA				
ContactEmail:				
info@6harmonics.com				
ContactTelephone:				
6133661768				
GWS Cmd >				

Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:EE:38:02:00:88
11:48:13 up 31 min, load average: 0.19, 0.24, 0.21
MemFree: 38620 kB
Channel:
34 35
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
TX Down

steven — telnet 192.168.3.204 — 80x38
Content-Type: Application/xml
Connection: close
Content-Length: 614
<RegistrationRequest xmlns="http://schemas.datacontract.org/2004/07/SpectrumBridge.WhiteSpaces.Services.v3"><AntennaHeight>31</AntennaHeight><ContactCity>ottawa</ContactCity><ContactCountry>CA</ContactCountry><ContactEmail>info@6harmonics.com</ContactEmail><ContactName>info</ContactName><ContactPhone>6133661768</ContactPhone><ContactState>ON</ContactState><ContactStreet>Suite 10-21 Concours Gate</ContactStreet><ContactZip>K2E7S4</ContactZip><DeviceOwner>6H</DeviceOwner><DeviceType>8</DeviceType><Latitude>44.429534</Latitude><Longitude>-75.15075</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: 10
SBI-HC: 0.000
X-Powered-By: ASP.NET
Date: Mon, 29 Feb 2016 16:47:59 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

Delay 30 sec

Figure 8.13-2: Data log of unsuccessful registration with restricted antenna height of master device

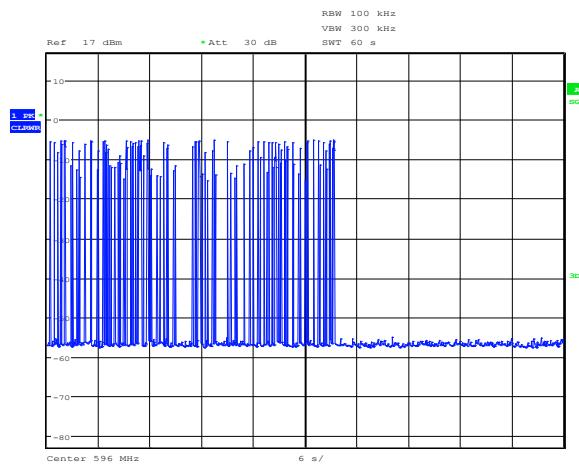
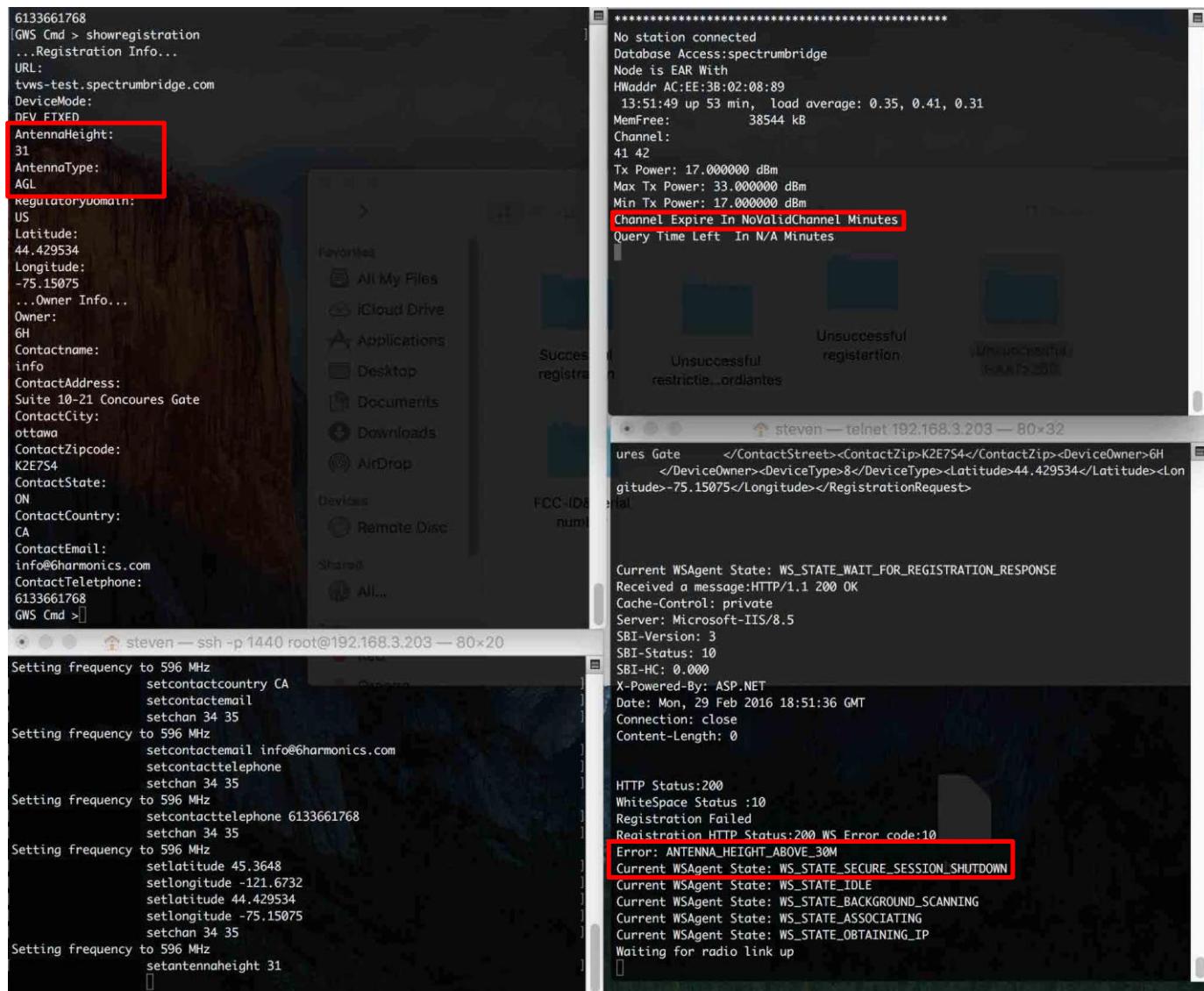


Figure 8.13-3:Unsuccessful registration with antenna height of slave device.
Spectrum plot shows that prior to the unsuccessful registration the EUT was transmitting to connect to the master device and perform the initial registration request. Subsequently the transmission stopped once the database responded 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".



6133661768
[GNS Cmd > showregistration
...Registration Info...
URL:
tws-test.spectrumbridge.com
DeviceMode:
DEV_FTXED
AntennaHeight:
31
AntennaType:
AGL
regulatoryDomain:
US
Latitude:
44.429534
Longitude:
-75.15075
...Owner Info...
Owner:
6H
Contactname:
info
ContactAddress:
Suite 10-21 Concours Gate
ContactCity:
ottawa
ContactZipcode:
K2E7S4
ContactState:
ON
ContactCountry:
CA
ContactEmail:
info@6harmonics.com
ContactTelephone:
6133661768
GNS Cmd >]

No station connected
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:3B:02:08:89
13:51:49 up 53 min, load average: 0.35, 0.41, 0.31
MemFree: 38544 kB
Channel:
41 42
Tx Power: 17.000000 dBm
Max Tx Power: 33.000000 dBm
Min Tx Power: 17.000000 dBm
Channel Expire In NoValidChannel Minutes
Query Time Left In N/A Minutes

steven — telnet 192.168.3.203 — 80x32
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 18:51:36 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

Setting frequency to 596 MHz
setcontactcountry CA
setcontactemail
setchan 34 35
Setting frequency to 596 MHz
setcontactemail info@6harmonics.com
setcontacttelephone
setchan 34 35
Setting frequency to 596 MHz
setcontacttelephone 6133661768
setchan 34 35
Setting frequency to 596 MHz
setlatitude 45.3648
setlongitude -121.6732
setlatitude 44.429534
setlongitude -75.15075
setchan 34 35
Setting frequency to 596 MHz
setantennaheight 31

Figure 8.13-4: Data log of unsuccessful registration with restricted antenna height of slave device

Section 8	Testing data
Test name	FCC 15.713(g)(3)(i) and (ii) Unsuccessful registration due to incomplete information – FCC ID and Serial number
Specification	FCC Part 15 Subpart H



8.14 FCC 15.713(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 FCC 15.713(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 FCC 15.711(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.

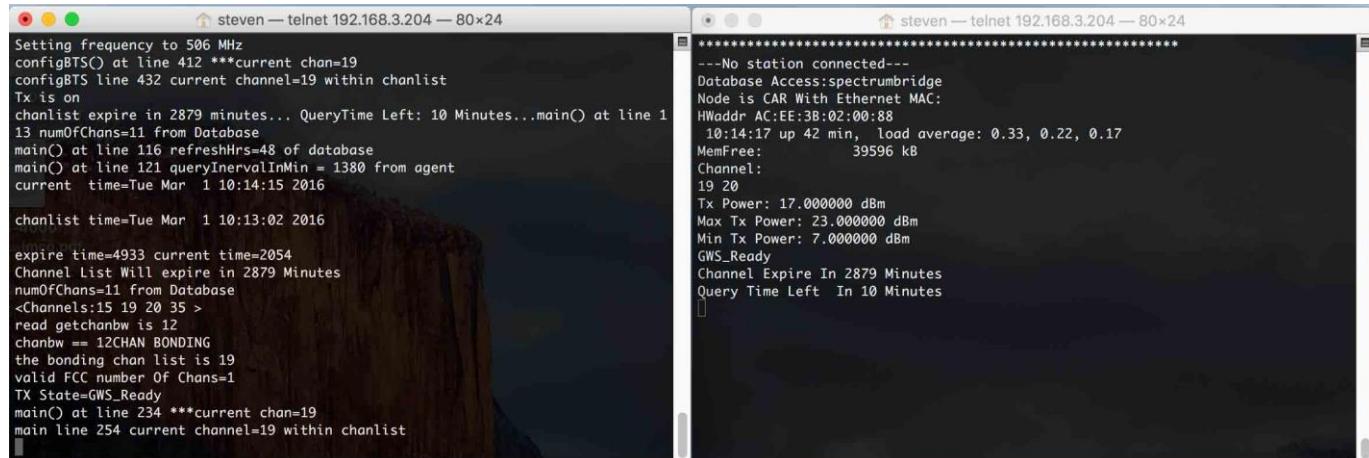
8.16.2 Test summary

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



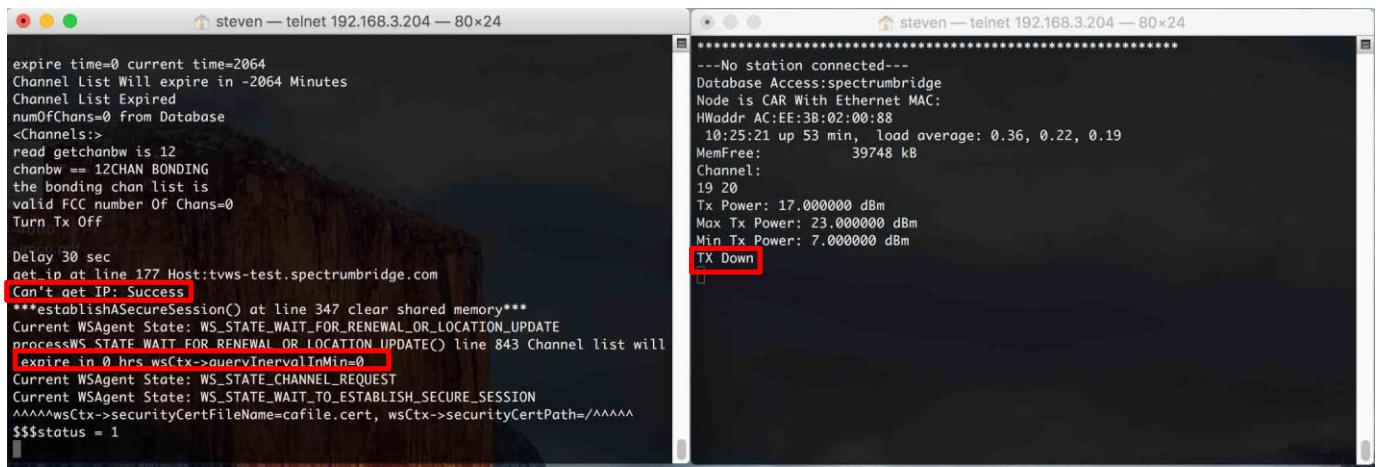
```
Setting frequency to 506 MHz
configBTS() at line 412 ***current chan=19
configBTS line 432 current channel=19 within chanlist
Tx is on
chanlist expire in 2879 minutes... QueryTime Left: 10 Minutes...main() at line 1
13 numOfChans=11 from Database
main() at line 116 refreshHrs=48 of database
main() at line 121 queryIntervalInMin = 1380 from agent
current time=Tue Mar 1 10:14:15 2016

chanlist time=Tue Mar 1 10:13:02 2016
expire time=4933 current time=2054
Channel List Will expire in 2879 Minutes
numOfChans=11 from Database
<Channels:15 19 20 35 >
read getchanbw is 12
chanbw == 12CHAN BONDING
the bonding chan list is 19
valid FCC number Of Chans=1
TX State=GWS_Ready
main() at line 234 ***current chan=19
main line 254 current channel=19 within chanlist
```



```
*****
--No station connected--
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:EE:3B:02:00:88
10:14:17 up 42 min, load average: 0.33, 0.22, 0.17
MemFree: 39596 kB
Channel:
19 20
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
GWS_Ready
Channel Expire In 2879 Minutes
Query Time Left In 10 Minutes
```

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



```

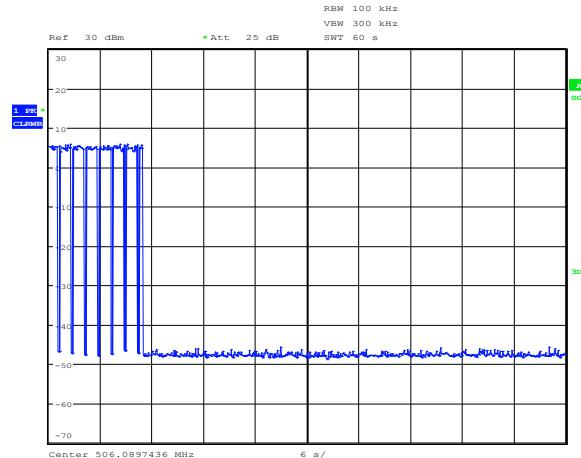
steven — telnet 192.168.3.204 — 80x24
steven — telnet 192.168.3.204 — 80x24

expire time=0 current time=2064
Channel List Will expire in -2064 Minutes
Channel List Expired
numOfChans=0 from Database
<Channels:>
read getchanbw is 12
chanbw == 12CHAN BONDING
the bonding chan list is
valid FCC number Of Chans=0
Turn Tx Off
Delay 30 sec
get_ip at line 177 Host:tws-test.spectrumbridge.com
Can't get IP: Success
***establishASecureSession() at line 347 clear shared memory***
Current WSAgent State: WS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE
processWS_STATE_WAIT_FOR_RENEWAL_OR_LOCATION_UPDATE() line 843 Channel list will
expire in 0 hrs wsCtx->queryIntervalInMin=0
Current WSAgent State: WS_STATE_CHANNEL_REQUEST
Current WSAgent State: WS_STATE_WAIT_TO_ESTABLISH_SECURE_SESSION
^^^^^wsCtx->securityCertificateName=cafile.cert, wsCtx->securityCertPath=/^^^^^
$$$$status = 1

*****No station connected---
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:EE:38:02:00:88
10:25:21 up 53 min, load average: 0.36, 0.22, 0.19
MemFree: 39748 kB
Channel:
19 20
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
TX Down

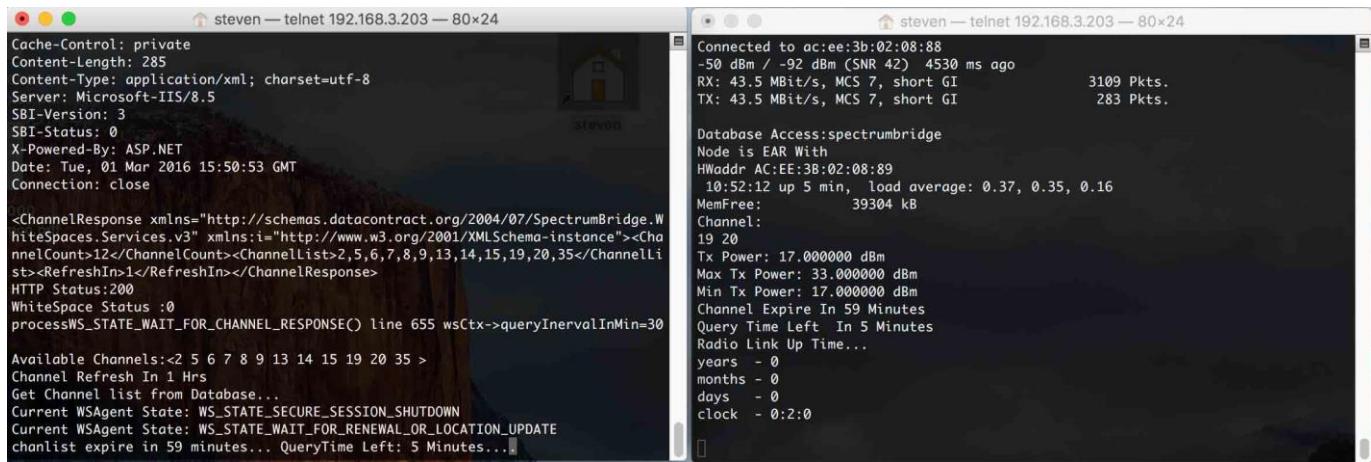
```

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



Date: 1.MAR.2016 10:13:52

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



The image shows two terminal windows side-by-side. The left window is titled 'steven — telnet 192.168.3.203 — 80x24' and displays a series of configuration and status messages. The right window is also titled 'steven — telnet 192.168.3.203 — 80x24' and shows a log of a registration process, including channel statistics and a timer for a channel list refresh.

```
steven — telnet 192.168.3.203 — 80x24
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 15:50:53 GMT
Connection: close

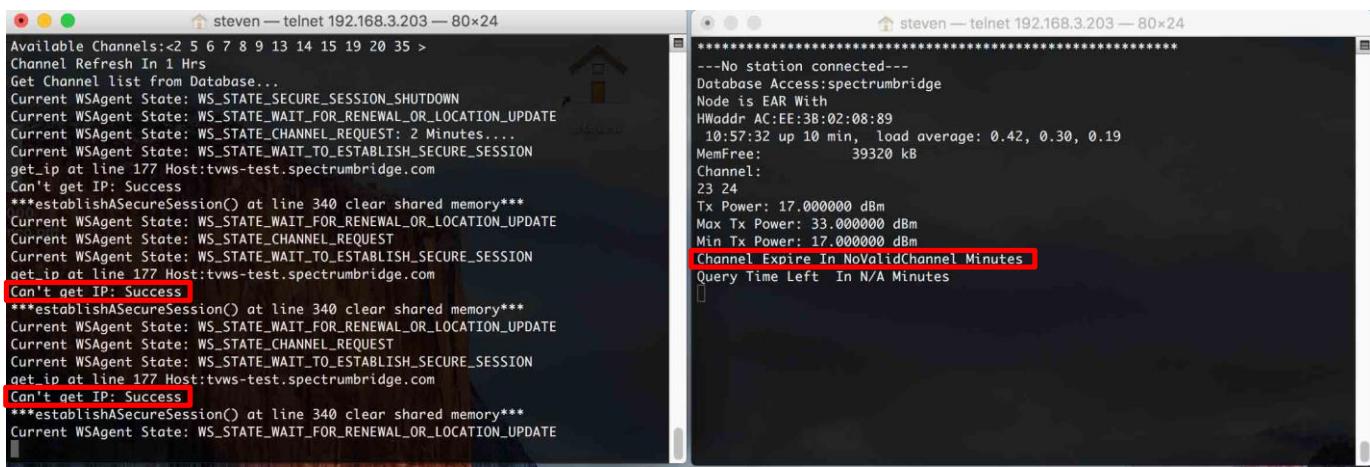
<ChannelResponse xmlns="http://schemas.datacontract.org/2004/07/SpectrumBridge.W
hiteSpaces.Services.v3" xmlns:i="http://www.w3.org/2001/XMLSchema-instance"><Ch
annelCount>12</ChannelCount><ChannelList>2,5,6,7,8,9,13,14,15,19,20,35</Channe
ls><RefreshIn>1</RefreshIn></ChannelResponse>
HTTP Status:200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

Connected to ac:ee:3b:02:08:88
-50 dBm / -92 dBm (SNR 42) 4530 ms ago
RX: 43.5 MBit/s, MCS 7, short GI 3109 Pkts.
TX: 43.5 MBit/s, MCS 7, short GI 283 Pkts.

Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:3B:02:08:89
10:52:12 up 5 min, load average: 0.37, 0.35, 0.16
MemFree: 39304 kB
Channel:
19 20
Tx Power: 17.000000 dBm
Max Tx Power: 33.000000 dBm
Min Tx Power: 17.000000 dBm
Channel Expire In 59 Minutes
Query Time Left In 5 Minutes
Radio Link Up Time...
years - 0
months - 0
days - 0
clock - 0:2:0
```

Figure 8.16-4: Data log of successful registration and transmission within the allocated time with internet access of slave device



steven — telnet 192.168.3.203 — 80x24

```

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:twvs-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:twvs-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:twvs-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

```

steven — telnet 192.168.3.203 — 80x24

```

*****
---No station connected---
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:38:02:08:89
10:57:32 up 10 min,  load average: 0.42, 0.30, 0.19
MemFree: 39320 kB
Channel:
23 24
Tx Power: 17.000000 dBm
Max Tx Power: 33.000000 dBm
Min Tx Power: 17.000000 dBm
Channel Expire In NoValidChannel Minutes
Query Time Left In N/A Minutes

```

Figure 8.16-5: Data log of unsuccessful registration and transmission down of slave device after the allocated time with blocked internet access of the master

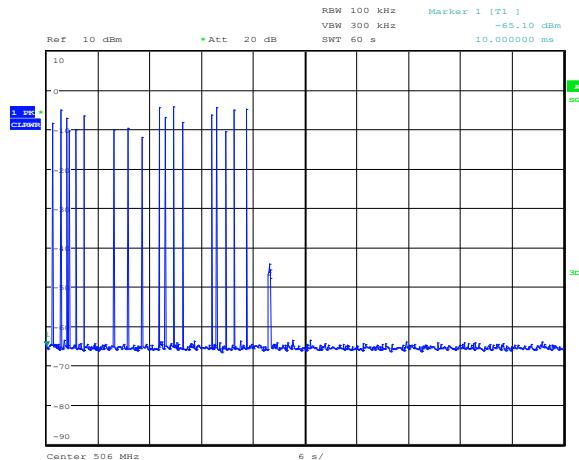


Figure 8.16-6: Transmission termination after the expiration of the allocated channel availability time of slave device

8.17 FCC 15.711(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.

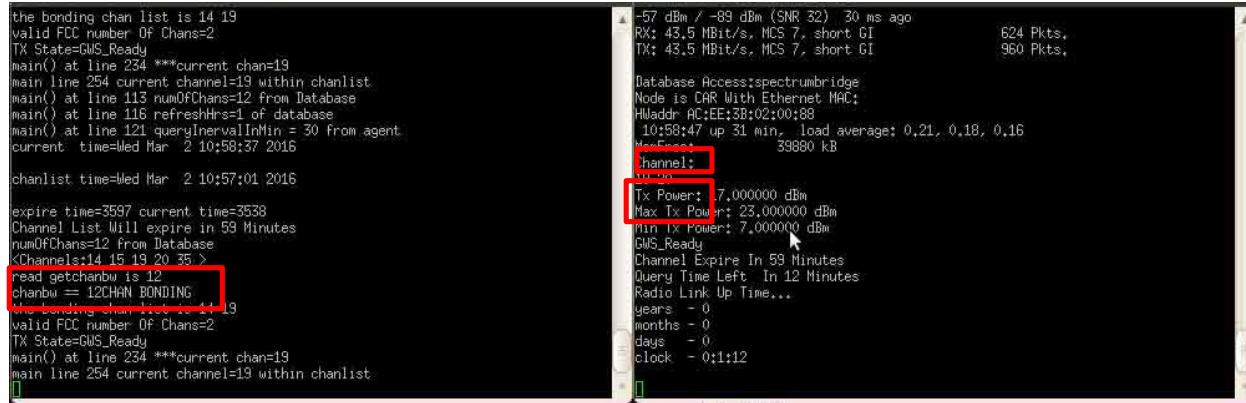
8.17.2 Test summary

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 WSDB that channel 19 would be registered for 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 temporary restricted and removed from the channel list.

8.17.4 Test data



```
the bonding chan list is 14 19
valid FCC number Of Chans=2
TX State=GWS_Ready
main() at line 234 ***current chan=19
main line 254 current channel=19 within chanlist
main() at line 113 numOfChans=12 from Database
main() at line 116 refreshHrs=1 of database
main() at line 121 queryIntervalInMin = 30 from agent
current time=Wed Mar 2 10:58:37 2016
chanlist time=Wed Mar 2 10:57:01 2016
expire time=3597 current time=3538
Channel List Will expire in 59 Minutes
numOfChans=12 from Database
<Channels:14 15 19 20 39>
read getchanbw 1c 12
chanbw == 12CHAN BONDING
... bonding chan list is 14 19
valid FCC number Of Chans=2
TX State=GWS_Ready
main() at line 234 ***current chan=19
main line 254 current channel=19 within chanlist
[...]
```

-57 dBm / -89 dBm (SNR 32) 30 ms ago
RX: 43.5 MBit/s., MCS 7, short GI 624 Pkts.
TX: 43.5 MBit/s., MCS 7, short GI 960 Pkts.
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr AC:EE:3B:02:00:88
10:58:47 up 31 min. load average: 0.21, 0.18, 0.16
MemFree: 39880 kB
channel:
Tx Power: 7.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
GWS_Ready
Channel Expire In 59 Minutes
Channel Expire In 59 Minutes
Query Time Left In 12 Minutes
Radio Link Up Time...
years - 0
months - 0
days - 0
clock - 0:1:12

Figure 8.17-1: Data log of successful registration and transmission of master device within the allocated time at the channels 19 and 20. Allotted channel list includes these channels. Low-power device reserved channel 19 at 11:00 am.

```
main() at line 116 refreshHrs=48 of database
main() at line 121 queryInervalInMin = 1380 from agent
current time=Wed Mar 2 11:13:28 2016

chanlist time=Wed Mar 2 11:13:26 2016

expire time=6433 current time=3553
Channel List Will expire in 2880 Minutes
numNARChans=11 from Database
Channels<14 15 20 35 >
read getchanbw is 12
chanbw == 12CHAN BONDING
the bonding chan list is 14
valid FCC number Of Chans=1
TX State=TX Down
Get channel List,Turn Tx On
Mrite Chanlist to file with number of channel = 1*
14
getchanbw in ConfigBTS is 12
Invalid channel - Channel is not within the chanlist
configBTS() at line 412 ***current char=1
set new channel cmd=<setchan 14 15>
Setting frequency to 476 MHz
```

```
*****
No station connected
Database Access:spectrumbridge
Node is CAR With Ethernet MAC:
HWaddr 00:FE:38:02:00:88
11:13:41 up 46 min, load average: 0.35, 0.21, 0.16
memfree: 38808 kB
channel:
14 15
Tx Power: 17.000000 dBm
Max Tx Power: 23.000000 dBm
Min Tx Power: 7.000000 dBm
QoS_Ready
Channel Expire In 2880 Minutes
Query Time Left In 1380 Minutes
```

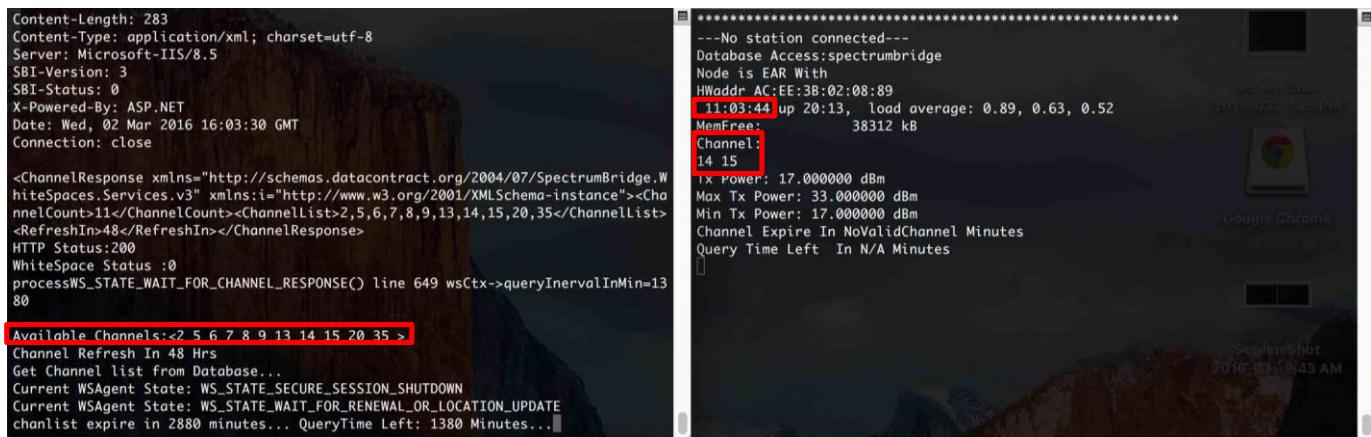
Figure 8.17-2: Data log of successful registration and transmission of master device at the channels 14 and 15 after registration of the channel 19 for low-power device. Channel 19 was excluded from the newly accepted channel list after 11:00 am.

```
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 15:45:13 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"><Ch
annelCount>12</ChannelCount><ChannelList>2,5,6,7,8,9,13,14,15,19,20,35</Channe
lList><RefreshIn>1</RefreshIn></ChannelResponse>
HTTP Status:200
WhiteSpace Status :0
processWS_STATE_WAIT_FOR_CHANNEL_RESPONSE() line 655 wsCtx->queryInervalInMin=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 57 minutes... QueryTime Left: 27 Minutes...
```

```
Connected to ac:ee:3b:02:08:88
-57 dBm / -93 dBm (SNR 36) 0 ms ago
RX: 43.5 Mbit/s, MCS 7, short GI 28805 Pkts.
TX: 43.5 Mbit/s, MCS 7, short GI 7260 Pkts.

Database Access:spectrumbridge
Node is EAR With
HWaddr AC:FE:38:02:08:89
10:48:16 up 19:57, load average: 0.53, 0.46, 0.35
MemFree: 37200 kB
channel:
19 20
Tx Power: 17.000000 dBm
Max Tx Power: 33.000000 dBm
Min Tx Power: 17.000000 dBm
Channel Expire In 57 Minutes
Query Time Left In 27 Minutes
Radio Link Up Time...
years - 0
months - 0
days - 0
clock - 0:14:59
```

Figure 8.17-3: Data log of successful registration and transmission of slave device within the allocated time at the channels 19 and 20. Allotted channel list includes these channels. Low-power device reserved channel 19 at 11:00 am.



```
Content-Length: 283
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 16:03:30 GMT
Connection: close

<ChannelResponse xmlns="http://schemas.datacontract.org/2004/07/SpectrumBridge.Wi
hiteSpaces.Services.v3" xmlns:i="http://www.w3.org/2001/XMLSchema-instance"><Ch
annelCount>11</ChannelCount><ChannelList>2,5,6,7,8,9,13,14,15,20,35</ChannelList>
<RefreshIn>48</RefreshIn></ChannelResponse>
HTTP Status:200
WhiteSpace Status :0
processWS_STATE_WAIT_FOR_CHANNEL_RESPONSE() line 649 wsCtx->queryInervalInMin=13
80

Available Channels:<2 5 6 7 8 9 13 14 15 20 35 >
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
chanlist expire in 2880 minutes... QueryTime Left: 1380 Minutes...

*****No station connected---
Database Access:spectrumbridge
Node is EAR With
HWaddr AC:EE:38:02:08:89
11:03:44 up 20:13, load average: 0.89, 0.63, 0.52
MemFree: 38312 kB
Channel:
14 15
Tx Power: 17.000000 dBm
Max Tx Power: 33.000000 dBm
Min Tx Power: 17.000000 dBm
Channel Expire In NoValidChannel Minutes
Query Time Left In N/A Minutes
```

Figure 8.17-4: Data log of successful registration and slave device start passive scanning from channel 14 and 15 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 FCC 15.711(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

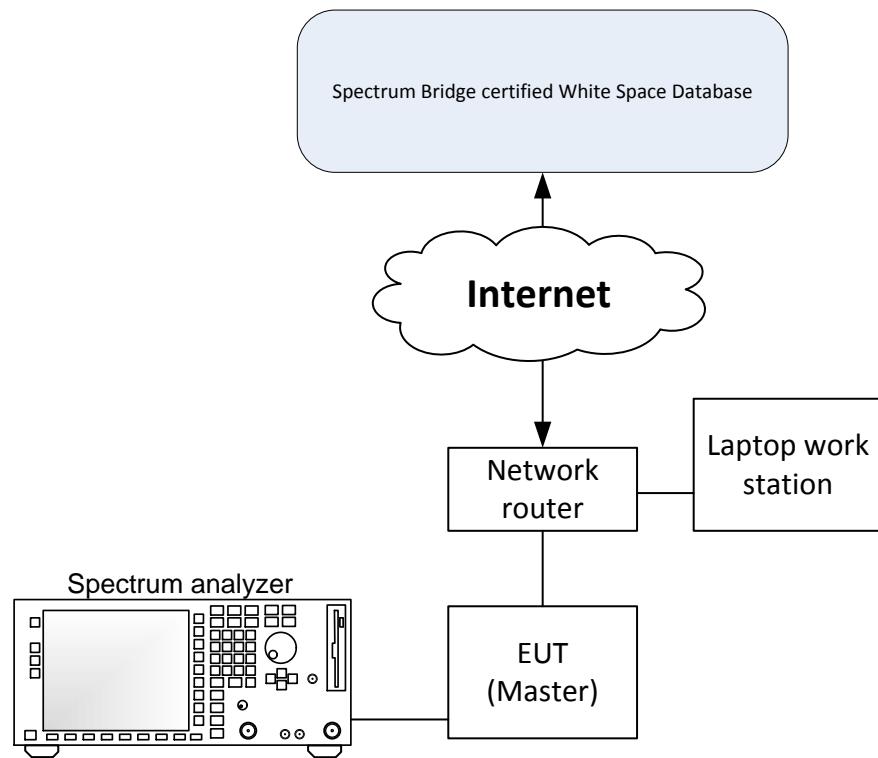
Test date	March 1, 2016	Temperature	23 °C
Test engineer	Andrey Adelberg	Air pressure	1008 mbar
Verdict	Pass	Relative humidity	34 %

8.18.3 Observations, settings and special notes

Please see the attached document: 6H SBI Secure Communications Cert-4012-23.pdf

Section 9. Block diagrams of test set-ups

9.1 Master test setup diagram



9.2 Slave test setup diagram

