



## Release Notes for AutoMesh™ 7.16(M1).5.0

Software and firmware: HotView Pro™ software 10.16.5.0 and HotPort™ firmware 7.16(M1).5.0

Effective date: 7/4/2014

Hardware compatibility: The next table lists the product-specific firmware in this release:

Product	Version
HotPort 5020-LNK	7.16(M1).5.0
HotPort 5020-E	7.16(M1).5.0
HotPort 5020-M	7.16(M1).5.0
HotPort 7000	7.16(M1).5.0
HotPort 7000-900	7.16(M1).5.0
HotPort 6000	4.16(N).0.0
FMC-2000	7.16(M1).5.0
HotPoint AP 5000	5.55(N).0.0
HotView Pro	10.16.5.0
This release supports PostgreSQL Database versions 8.2 to 9.2.	

### Upgrade table

You can upgrade to Automesh 7.16(M1).5.0 from the versions listed in the following table.

7000	7000-900	5020	6000	FMC-2000	HotView Pro	HotPoint 5xxx
7.15(M2).10.0	7.14(M2).10.0	7.15(M2).10.0	NA	7.15(M2).10.0	10.15.10.0	5.54(E).1.1
7.15(M1).5.0	7.14(M1).5.0	7.15(M1).5.0	NA	7.15(M1).5.0	10.15.5.0	5.54(M1).1.0
7.15(N).0.0	7.14(N).0.0	7.15(N).0.0	NA	7.15(N).0.0	10.15.0.0	5.54(N).0.0
7.9(T).0.0	7.13(T).0.0	NA	4.13(T).0.0	7.9(T).0.0	10.9.1.0	5.53(T).0.0
7.6.6.0	--	NA	--	NA	10.6.4.0	--
7.6.0.0	--	NA	--	NA	10.6.0.0	--

Additionally, HotPoint 5xxx can be upgraded to the current release 5.55(N).0.0 from versions mentioned in the following table using HotView, Script and HTTP:

Firmware version	HotView Pro version
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5.54(E).1.1	10.16.0.0
5.54(C).1.0	10.15.0.0
5.53(T).4.0	10.9.0.0
5.53(C).0.0	10.9.0.0

## New Features

### Mobility:

- Mobile Node Configuration recovery: Configuration on a Mobile node can be restored using the following CLI:

```
ftsh >> conf mobility mn_recovery <static_attach_ip> <ifnum> <MN Serial>
```

*Where, static\_attach\_ip is the fmrp ip on which MN Recovery operation is initiated*

- Performance and functional enhancements on Mobile node redundancy and linear mobility features

### AP

- The maximum number of WDS clients supported per WDS server is increased from 4 to 8
- Links between WDS server and WDS client APs are displayed in HotView Pro
- Extended Range setting up to 9 miles/14.5 Km can be configured per radio

## Bug fixes

- Fixed RSSI degradation on 7000 and 7000-900 nodes
- Forwarding of STP BPDU frames from wireless to Ethernet is fixed

## Known Issues, limitations, and Notes

### Notes on HotPoint 5000s (APs)

- Advanced option to alter frequency band per radio has been removed
- Importing a configuration file from an AP that has WDS configured and then applying it on the same or a different AP is not supported
- At least one active VAP should be configured for Spectrum Analysis tool to deliver the expected results
- Fragmentation Threshold cannot be set for an AP Group that contains a mixture of MIMO and non-MIMO APs

### Notes for HotPort (mesh nodes)

- In HotView Pro, RAT (Radio Analysis Tool) has been renamed to MCT (Mobility Configuration Tool)
- Telnet to mobile node from Mobility View is not supported
- The port priority applied for traffic mesh nodes is set to “high” by default, but the user can overwrite this by enabling QoS and configuring the desired priority settings
- Default Channels for the following countries have been changed:

Country	Channel (Radio 1)	Channel (Radio 2)
Vietnam	149	165
Japan	36	48
Indonesia	149	165
India	36	48
Malaysia	149	165
Russia	149	165
Thailand	149	165

## Upgrade Procedures

This section contains the upgrade procedures for each product type

### Mesh Upgrade Procedures

#### Static Mesh

- Login to the Mesh using HotView Pro version corresponding to the firmware on the nodes
- Take a backup of the mesh-wide and node configurations, mesh analytics data, and database
- Close the existing HotView Pro
- Install the new HotView Pro version 10.16(M1).5.0 and launch it
- Verify that no DB related errors are seen which ensures that the database tables update happened smoothly
- Load the mesh into HotView Pro 10.16(M1).5.0 and ensure that all mesh nodes are loaded
- Upgrade the mesh, Gateway Server, Gateway Interface, and Access Points via the upgrade scheduler. In case of redundant GWS in the mesh, it is recommended to upgrade both GWS nodes at the same time.
- After upgrade the nodes will reboot and load back into HotView
- Ensure that all nodes are running the latest firmware

#### Mobility Mesh

- Login to the FMC & Mesh using HotView Pro version (e.g. 10.15.5.0) corresponding to the firmware on the devices (e.g. 7.15.5.0)
- Take a backup of mesh-wide configuration, node configurations and FMC configuration
- Take a backup of mesh analytics data (applicable for HotView Pro 10.9.1.0 and upwards)
- If using database, take DB backup, taking care to choose the “role” and format as “tar” when using PostgreSQL 9.1. The “role” field is the same user configured in DB screen of HV Server and PostgreSQL
- Close the existing HotView Pro (e.g. 10.15.5.0)
- Install HotView Pro 10.16(M1).5.0 and launch it
- Verify that no DB related errors are seen which ensures that the database tables update happened smoothly

- Load the FMC & Mesh into the new HotView Pro 10.16(M1).5.0 and ensure that all devices are loaded
- Disconnect the secondary(standby) FMC
- Upgrade the active/Primary FMC to the latest image 7.16(N).5.0
- Disconnect the primary FMC, and reconnect the secondary FMC
- Once the secondary FMC becomes Active upgrade it to 7.16(N).5.0
- Reconnect both FMCs to the setup
- After the FMCs come up in the HotView Pro, proceed to upgrade the mobile node(s) through the FMC
- Upgrade the mesh, Gateway Server, Gateway Interface, and Access Points via the upgrade scheduler. In case of redundant GWS in the mesh, it is recommended to upgrade both GWS nodes at the same time.
- After upgrade the devices will reboot and load back into HotView
- Ensure that all devices are running the latest firmware

#### 5020-LNK

- Login to the 5020-LNK network using existing HotView Pro (e.g. 10.15.5.0) corresponding to the firmware on the 5020-LNK nodes (e.g. 7.15.5.0)
- Backup all configurations and take a database backup
- Close the existing HotView Pro (e.g. 10.15.5.0) and install the HotView Pro 10.16(M1).5.0 and launch the software
- Verify that no DB related errors are seen which ensures that the database tables update happened smoothly
- Add the 5020-LNK nodes as a new Mesh and upgrade to release 7.16(N).5.0
- After upgrade the nodes will reboot and load back into HotView
- Ensure that the nodes are running the latest firmware

#### **HotPoint-5000 Upgrade Procedures**

##### Upgrade using HotView Pro

- Log into the Hotpoint5xxx using Hotview Pro corresponding to the firmware running on the 5xxx HotPoint devices
- Take a backup of all HotPoint devices and database
- Close the existing HotView Pro, install the new HotView Pro 10.16(M1).5.0 and launch it
- Verify that no DB related errors are seen, which ensure that the database tables update happened correctly
- Add the HotPoint 5000 APs in the new HotView Pro 10.16(M1).5.0
- Upgrade the HotPoint-5000 units to firmware 5.55(N).0.0 by initiating upgrade via the upgrade scheduler
- After upgrade the HotPoint-5xxx devices will reboot
- Ensure that each HotPoint-5xxx is running the latest firmware

##### Upgrade Procedure using AP HTTP

- Open a web browser and enter an AP's IP Address in address bar and press Enter
- Login with the username and Password as "admin" and "firtide" respectively
- Go to Maintenance -> Upgrade and then click on "choose file" to select the desired firmware file
- Click on the Apply Button to begin
- This process can take between 2-3 minutes to complete
- Check the firmware version via the web interface to confirm the change

##### Upgrade Procedure using script

- Save "upgrade\_5.55.0.0.zip" on your system and extract the zip content
- An "upgrade\_5.55.0.0" folder will be created
- Navigate into this folder and open the "IP\_LIST.cfg" file using Notepad
- Add the IP Address of each IP that you intend to upgrade (a unique IP Address per line)
- Save and close the file

- Double-click on the “AP\_FW\_Upgrade.exe” file to start the upgrade procedure
- This process can take between to 4-5 minutes to complete and the HotPoint-5xxx devices will reboot
- After upgrade, verify that the latest firmware version is getting displayed via HotView Pro/ HTTP

## Appendix A

System requirements:

The following Operating Systems, Java versions, and database versions are approved for use with this software and firmware release:

Operating System	Java Version	DB version
Windows 7, 8 Professional – 64-bit, Windows 7 Professional – 32 bit, Windows 2008 Server – 64 bit, Linux Fedora FC16 – 64 bit, FC17 – 32 bit	Java 1.6, Update 34 - 32-bit Java 1.7 32 and 64 bit	PostgreSQL 9.0 or greater is recommended

## Appendix B

This appendix lists the country-specific channel changes from release 7.6.0.0. If a radio is configured with a channel that is no longer supported in that country code, HotView Pro will change the channel to a supported channel during the upgrade process.

*How to use these tables:* Find the country list, and then compare the channels that are in use in your network to the channels in the unsupported channel list. If you are using channels that are unsupported, do one of these procedures:

- It is advisable that before upgrade, any unsupported channels in the mesh are changed to supported ones.  
OR
- During the upgrade, HotView Pro will change unsupported channels to supported ones based on the following tables. For e.g. in USA country code channel 120 A (OFDM) will be changed to channel 36 A (OFDM).

### USA—affected channels

120, 124, 128 - All modes

16, 17, 23, 24, 26, 27, 116 – 40 MHz

### USA—default values for automatic configuration during upgrade

Unsupported channel	Change to supported channel
16 4.9 40 MHz	16 4.9 20 MHz
17 4.9 40 MHz Minus	17 4.9 20 MHz
23 4.9 40 MHz Plus	23 4.9 20 MHz

24 4.9 40 MHz Plus	24 4.9 20 MHz
26 4.9 40 MHz Minus	26 4.9 20 MHz
27 4.9 40 MHz Minus	27 4.9 20 MHz
116 NA 40 MHz Plus	36 NA 40 MHz PLUS
120 A (OFDM)	36 A (OFDM)
124 A (OFDM)	36 A (OFDM)
128 A (OFDM)	36 A (OFDM)
120 NA20 MHz	36 NA 20 MHz
124 NA20 MHz	36 NA 20 MHz
128 NA20 MHz	36 NA 20 MHz
120 NA40 MHz MINUS	40 NA 40 MHz MINUS
124 NA40 MHz PLUS	36 NA 40 MHz PLUS
128 NA40 MHz MINUS	40 NA 40 MHz MINUS

**AUSTRALIA—affected channels**

120, 124, 128 - All modes

116 – 40 MHz

**AUSTRALIA—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
120 A (OFDM)	36 A (OFDM)
124 A (OFDM)	36 A (OFDM)
128 A (OFDM)	36 A (OFDM)
120 NA20 MHz	36 NA 20 MHz
124 NA20 MHz	36 NA 20 MHz
128 NA20 MHz	36 NA 20 MHz
120 NA40 MHz MINUS	40 NA 40 MHz MINUS
124 NA40 MHz PLUS	36 NA 40 MHz PLUS
128 NA40 MHz MINUS	40 NA 40 MHz MINUS
116 NA40 MHz PLUS	36 NA 40 MHz PLUS

**CANADA—affected channels**

165 - All modes

**CANADA—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
165 A (OFDM)	36 A (OFDM)
165 NA 20 MHZ	36 NA 20 MHZ

**IRELAND—affected channels**

145, 149, 153, 157, 161, 165, 169, 173 - All modes

**IRELAND—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
145 A (OFDM)	36 A (OFDM)
149 A (OFDM)	36 A (OFDM)
153 A (OFDM)	36 A (OFDM)
157 A (OFDM)	36 A (OFDM)
161 A (OFDM)	36 A (OFDM)
165 A (OFDM)	36 A (OFDM)
169 A (OFDM)	36 A (OFDM)
173 A (OFDM)	36 A (OFDM)
145 NA 20 MHZ	36 NA 20 MHZ
149 NA 20 MHZ	36 NA 20 MHZ
153 NA 20 MHZ	36 NA 20 MHZ
157 NA 20 MHZ	36 NA 20 MHZ
161 NA 20 MHZ	36 NA 20 MHZ
165 NA 20 MHZ	36 NA 20 MHZ
169 NA 20 MHZ	36 NA 20 MHZ
173 NA 20 MHZ	36 NA 20 MHZ
145 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
149 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
153 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
157 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
161 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS

165 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
169 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
173 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS

**JAPAN\_JP1\_1—not supported**

WE DO NOT SUPPORT JAPAN\_JP1\_1 (395 CC)

**JAPAN—affected channels**

34, 38, 42, 46 , 185, 186, 187, 189 - All modes

6, 7, 9, 10, 11 - 802.11 A

**JAPAN 392—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
34 A (OFDM)	8 A (OFDM)
38 A (OFDM)	8 A (OFDM)
42 A (OFDM)	8 A (OFDM)
46 A (OFDM)	8 A (OFDM)
6 A (OFDM)	8 A (OFDM)
7 A (OFDM)	8 A (OFDM)
9 A (OFDM)	8 A (OFDM)
10 A (OFDM)	8 A (OFDM)
11 A (OFDM)	8 A (OFDM)
34 NA 20 MHZ	8 NA HT 20
38 NA 20 MHZ	8 NA HT 20
42 NA 20 MHZ	8 NA HT 20
46 NA 20 MHZ	8 NA HT 20
6 NA 20 MHZ	8 NA HT 20
7 NA 20 MHZ	8 NA HT 20
9 NA 20 MHZ	8 NA HT 20
10 NA 20 MHZ	8 NA HT 20
11 NA 20 MHZ	8 NA HT 20
34 NA 40 MHZ PLUS	8 NA 40 MHZ PLUS



38 NA 40 MHZ MINUS	12 NA 40 MHZ MINUS
42 NA 40 MHZ PLUS	8 NA 40 MHZ PLUS
46 NA 40 MHZ MINUS	12 NA 40 MHZ MINUS
6 NA 40 MHZ PLUS	8 NA 40 MHZ PLUS
7 NA 40 MHZ PLUS	8 NA 40 MHZ PLUS
10 NA 40 MHZ MINUS	12 NA 40 MHZ MINUS
11 NA 40 MHZ MINUS	12 NA 40 MHZ MINUS
185 4.9	184 4.9
186 4.9	184 4.9
187 4.9	184 4.9
189 4.9	184 4.9
185 4.9n 20 MHz	184 4.9 20 MHz
186 4.9n 20 MHz	184 4.9 20 MHz
187 4.9n 20 MHz	184 4.9 20 MHz
189 4.9n 20 MHz	184 4.9 20 MHz

**SAUDI ARABIA—affected channels**

149, 153, 157, 161 - All modes

**SAUDI ARABIA**

Unsupported channel	Change to supported channel
149 A (OFDM)	36 A (OFDM)
153 A (OFDM)	36 A (OFDM)
157 A (OFDM)	36 A (OFDM)
161 A (OFDM)	36 A (OFDM)
149 NA 20 MHZ	36 NA 20 MHZ
153 NA 20 MHZ	36 NA 20 MHZ
157 NA 20 MHZ	36 NA 20 MHZ
161 NA 20 MHZ	36 NA 20 MHZ

**UNITED KINGDOM—affected channels**

149, 153, 157, 161, 165 - All modes

**UNITED KINGDOM—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
149 A (OFDM)	36 A (OFDM)
153 A (OFDM)	36 A (OFDM)
157 A (OFDM)	36 A (OFDM)
161 A (OFDM)	36 A (OFDM)
165 A (OFDM)	36 A (OFDM)
149 NA 20 MHZ	36 NA 20 MHZ
153 NA 20 MHZ	36 NA 20 MHZ
157 NA 20 MHZ	36 NA 20 MHZ
161 NA 20 MHZ	36 NA 20 MHZ
165 NA 20 MHZ	36 NA 20 MHZ
149 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
153 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
157 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
161 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS

**MOROCCO—affected channels**

151, 155, 159, 163 - All modes

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 – NG HT40

**MOROCCO—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
1 NG 40 MHZ PLUS	1 NG 20 MHZ
2 NG 40 MHZ PLUS	2 NG 20 MHZ
3 NG 40 MHZ PLUS	3 NG 20 MHZ
4 NG 40 MHZ PLUS	4 NG 20 MHZ
5 NG 40 MHZ PLUS	5 NG 20 MHZ
6 NG 40 MHZ PLUS	6 NG 20 MHZ
7 NG 40 MHZ PLUS	7 NG 20 MHZ
8 NG 40 MHZ PLUS	8 NG 20 MHZ
9 NG 40 MHZ PLUS	9 NG 20 MHZ
5 NG 40 MHZ MINUS	5 NG 20 MHZ

6 NG 40 MHZ MINUS	6 NG 20 MHZ
7 NG 40 MHZ MINUS	7 NG 20 MHZ
8 NG 40 MHZ MINUS	8 NG 20 MHZ
9 NG 40 MHZ MINUS	9 NG 20 MHZ
10 NG 40 MHZ MINUS	10 NG 20 MHZ
11 NG 40 MHZ MINUS	11 NG 20 MHZ
12 NG 40 MHZ MINUS	12 NG 20 MHZ
13 NG 40 MHZ MINUS	13 NG 20 MHZ
151 A (OFDM)	36 A (OFDM)
155 A (OFDM)	36 A (OFDM)
159 A (OFDM)	36 A (OFDM)
163 A (OFDM)	36 A (OFDM)
151 NA 20 MHZ	36 NA 20 MHZ
155 NA 20 MHZ	36 NA 20 MHZ
159 NA 20 MHZ	36 NA 20 MHZ
163 NA 20 MHZ	36 NA 20 MHZ

**BRAZIL—affected channels**

149, 153, 157, 161, 165 - All modes

**BRAZIL—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
149 A (OFDM)	36 A (OFDM)
153 A (OFDM)	36 A (OFDM)
157 A (OFDM)	36 A (OFDM)
161 A (OFDM)	36 A (OFDM)
165 A (OFDM)	36 A (OFDM)
149 NA 20 MHZ	36 NA 20 MHZ
153 NA 20 MHZ	36 NA 20 MHZ
157 NA 20 MHZ	36 NA 20 MHZ
161 NA 20 MHZ	36 NA 20 MHZ
165 NA 20 MHZ	36 NA 20 MHZ

149 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
153 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
157 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
161 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS

**IRAQ—affected channels**

100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140 - All modes

**IRAQ—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
100 A (OFDM)	36 A (OFDM)
104 A (OFDM)	36 A (OFDM)
108 A (OFDM)	36 A (OFDM)
112 A (OFDM)	36 A (OFDM)
116 A (OFDM)	36 A (OFDM)
120 A (OFDM)	36 A (OFDM)
124 A (OFDM)	36 A (OFDM)
128 A (OFDM)	36 A (OFDM)
132 A (OFDM)	36 A (OFDM)
136 A (OFDM)	36 A (OFDM)
140 A (OFDM)	36 A (OFDM)
100 NA 20 MHZ	36 NA 20 MHZ
104 NA 20 MHZ	36 NA 20 MHZ
108 NA 20 MHZ	36 NA 20 MHZ
112 NA 20 MHZ	36 NA 20 MHZ
116 NA 20 MHZ	36 NA 20 MHZ
120 NA 20 MHZ	36 NA 20 MHZ
124 NA 20 MHZ	36 NA 20 MHZ
128 NA 20 MHZ	36 NA 20 MHZ
132 NA 20 MHZ	36 NA 20 MHZ
136 NA 20 MHZ	36 NA 20 MHZ
140 NA 20 MHZ	36 NA 20 MHZ

100 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
104 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
108 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
112 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
116 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
120 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
124 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
128 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
132 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
136 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS

**SOUTH AFRICA—affected channels**

140, 161, 153 – NA 40 MHZ PLUS  
149, 157, 165 – NA 40 MHZ MINUS

**SOUTH AFRICA—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
140 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
153 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
161 NA 40 MHZ PLUS	36 NA 40 MHZ PLUS
149 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
157 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS
165 NA 40 MHZ MINUS	40 NA 40 MHZ MINUS

**SOUTH KOREA—affected channels**

165 - All modes

**SOUTH KOREA—default values for automatic configuration during upgrade to 7.15.0.0**

Unsupported channel	Change to supported channel
165 A (OFDM)	36 A (OFDM)
165 NA 20 MHZ	36 NA 20 MHZ

**Appendix B**

Firetide mobility solutions are not supported in the countries/channels listed in the next tables.

**AUSTRALIA (36), RUSSIA (643), SOUTH AFRICA (710)**

<b>CHANNEL</b>	<b>CHANNEL(MHz)</b>
52	5260
56	5280
60	5300
64	5320
100	5500
104	5520
108	5540
112	5560
116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700

**FRANCE2 (255), INDIA (356), OMAN (512), SINGAPORE (702), TURKEY (792)**

<b>CHANNEL</b>	<b>CHANNEL(MHz)</b>
36	5180
40	5200
44	5220
48	5240
52	5260
56	5280
60	5300
64	5320

**AUSTRIA (40), BELGIUM (56), DENMARK (208), FINLAND (246), FRANCE (250), GERMANY (276), GHANA (288), GREECE (300), HUNGARY (348), IRAQ (368), ITALY (380), IRELAND(372), LUXEMBOURG (442), NETHERLANDS (528), NORWAY (578), POLAND (616), PORTUGAL (620), ROMANIA (642), SERBIA (688), SPAIN (724), SWEDEN (752), SWITZERLAND (756), U.A.E (784)**

<b>CHANNEL</b>	<b>CHANNEL(MHz)</b>
36	5180
40	5200
44	5220
48	5240
52	5260
56	5280
60	5300
64	5320
100	5500
104	5520
108	5540
112	5560

116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700

**JAPAN (392)**

CHANNEL	CHANNEL(MHz)
8	5040
12	5060
16	5080
36	5180
40	5200
44	5220
48	5240
52	5260
56	5280
60	5300
64	5320
100	5500
104	5520
108	5540
112	5560
116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700
184	4920
185	4925
186	4930
187	4935
188	4940
189	4945

**SOUTH KOREA (410)**

CHANNEL	CHANNEL(MHz)
36	5180
40	5200
44	5220
48	5240
52	5260
56	5280
60	5300
64	5320
100	5500
104	5520
108	5540



112	5560
116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700
149	5745
153	5765
157	5785
161	5805

**VIETNAM (704)**

<b>CHANNEL</b>	<b>CHANNEL(MHz)</b>
36	5180
40	5200
44	5220
48	5240