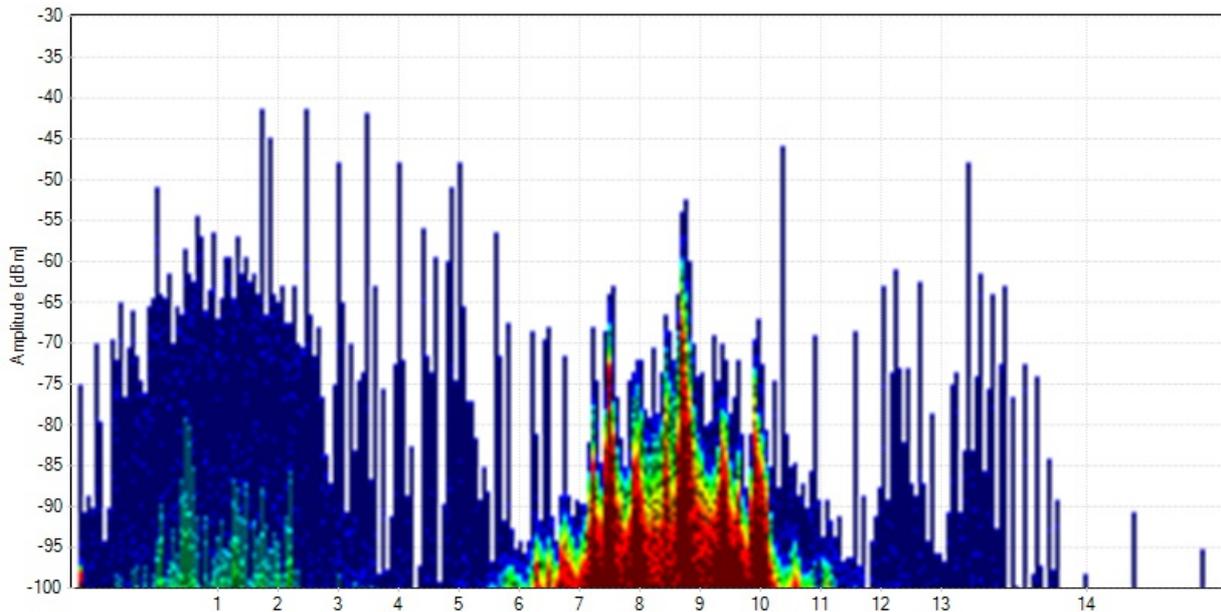


# Sample Report

Date: **Monday, November 18, 2013**

## Example: How to Read the Overview Pane

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The **Overview Pane** shows you what is currently happening in the spectrum around you. With **Color by Utilization** enabled, the intensity of the color shows how often a signal occurs. The more intense the color, the more often the spectrum is in use. This is called utilization, duty cycle, or airtime usage.

A blue spike is a short transmission, like a clap. A red spike is a long, continuous signal, like an air horn.

**Blue** - Less than 10 percent utilization

**Green** - 20 percent utilization

**Yellow** - 40 percent utilization

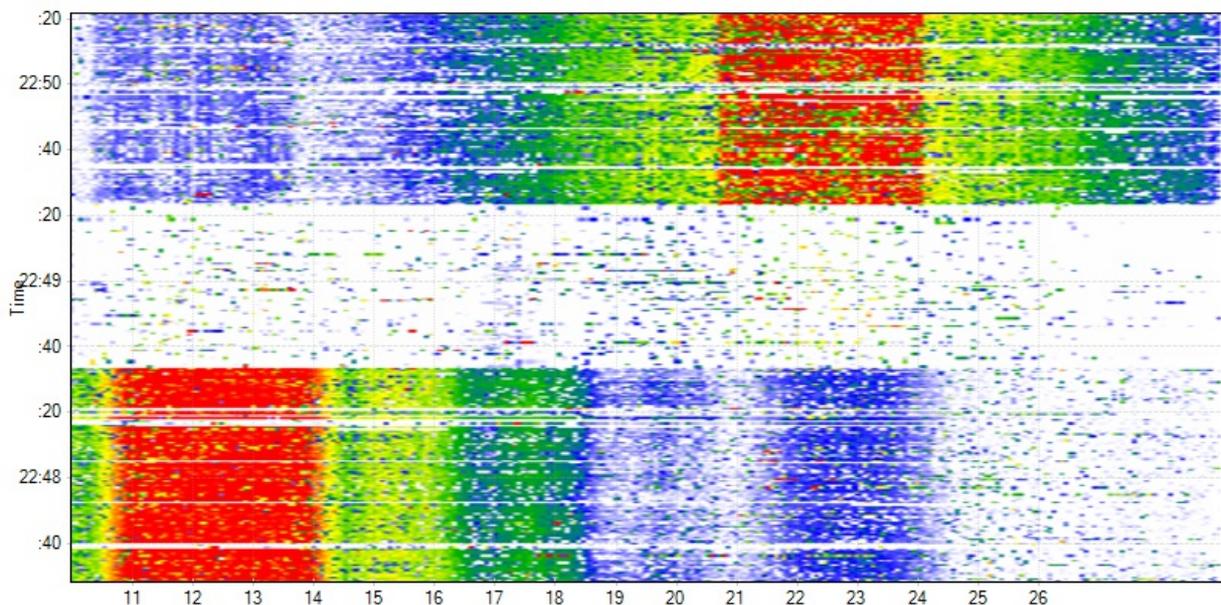
**Red** - Over 50 percent utilization

The height of each shape shows how loud it is.

In this example, we can see a non-Wi-Fi device near Wi-Fi channel 9 that is using at least 50 percent of the airtime. While this device (the known signature of a wireless video camera) is powered on, it's using up so much time on the air that Wi-Fi devices most likely won't get a chance to talk.

## Example: How to Read the Waterfall View

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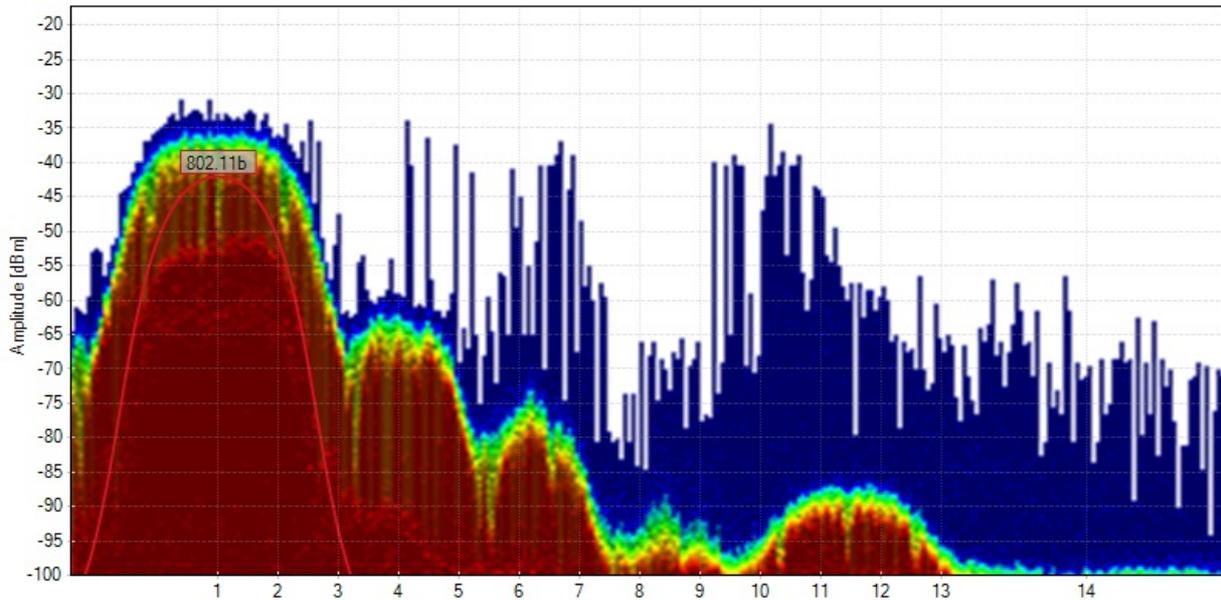


The Waterfall Graph shows amplitude over time for each frequency in the in the band, much like a seismometer graphs earthquakes over time. The colors represent power levels in the spectrum with dark blue as low, and bright red as higher amplitude levels - much like a Doppler radar weather map.

In this example, a device started talking on Wi-Fi channel 1, and then stopped. After a pause, another device started talking on channel 11.

## Example: 802.11b Signature

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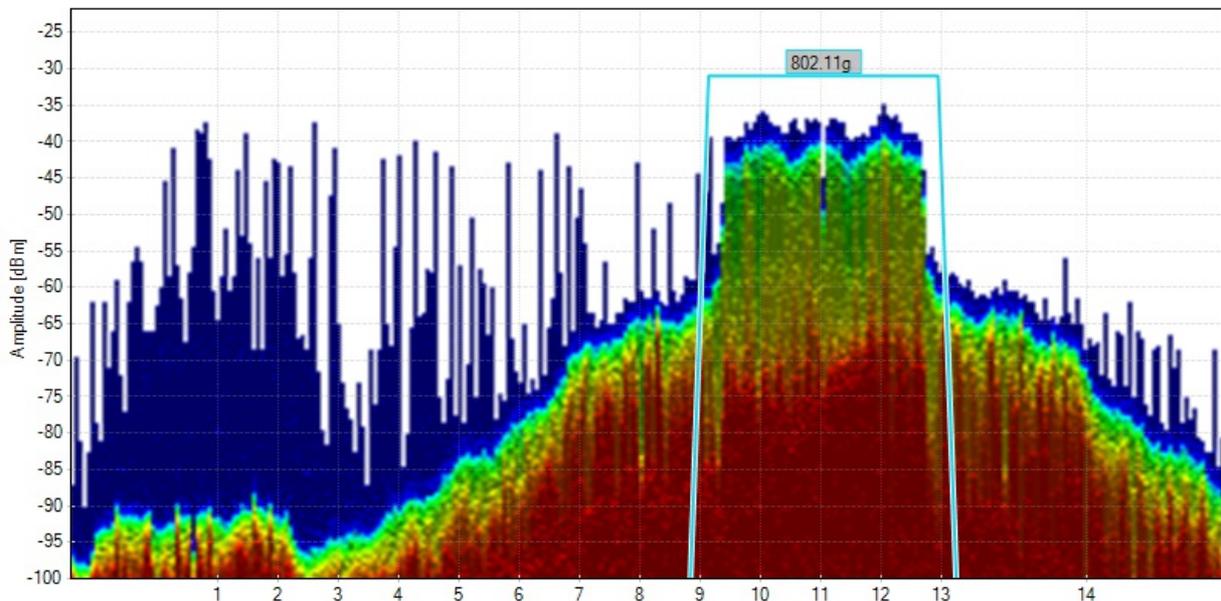


As 802.11b becomes less popular, this signature is becoming less common, but it's good to be familiar with it. This **curve shape with lobes on each side** is made by an **802.11b** network, or any 802.11g/n network running at legacy data rates like 1, 5.5, or 11 mbps. An 802.11g or 802.11n network will fall back to this shape from time to time, or when idling. To prevent this, legacy data rates can be disabled, which will improve network performance.

Chanalyzer draws a "curve" network shape (just like it's spectrum signature counterpart) to indicate that your wireless card has detected an 802.11b network, or a network using legacy data rates.

## 802.11g/n Signature

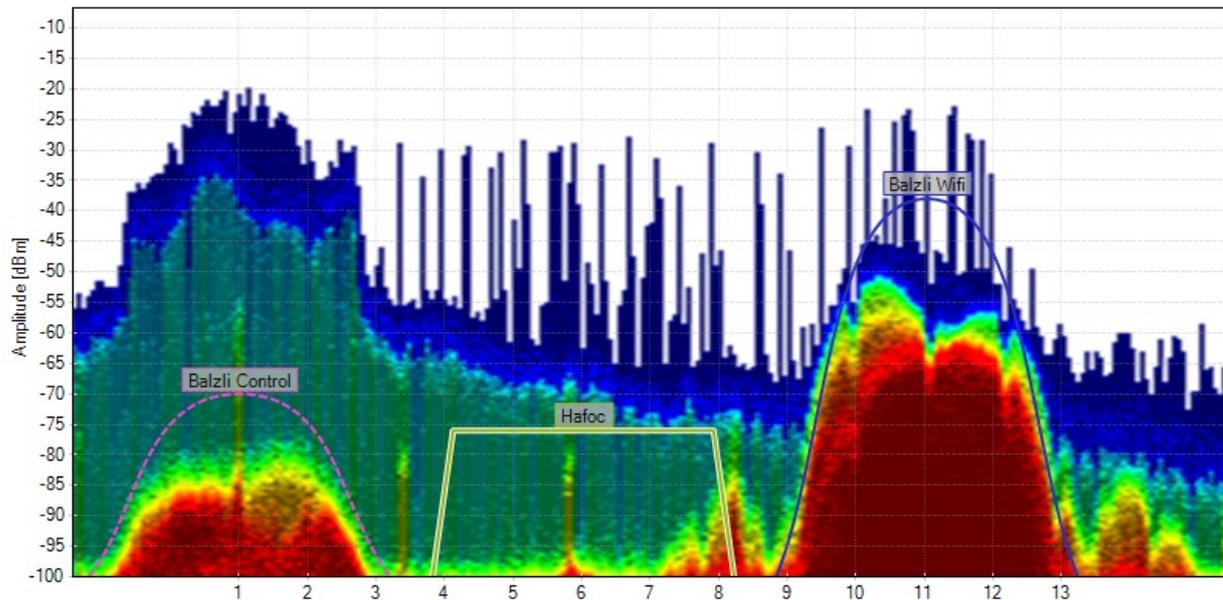
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The Density View maps and displays how often a frequency/amplitude point is being used. The less trafficked frequency ranges will appear more transparent. The colors represent amplitude height with reds indicating higher signals and darker blues lower power levels. An important feature of this view is that it picks up device-specific signatures which enables analysis of what types of electronics are emitting RF energy in the area.

## Utilization in Your Environment

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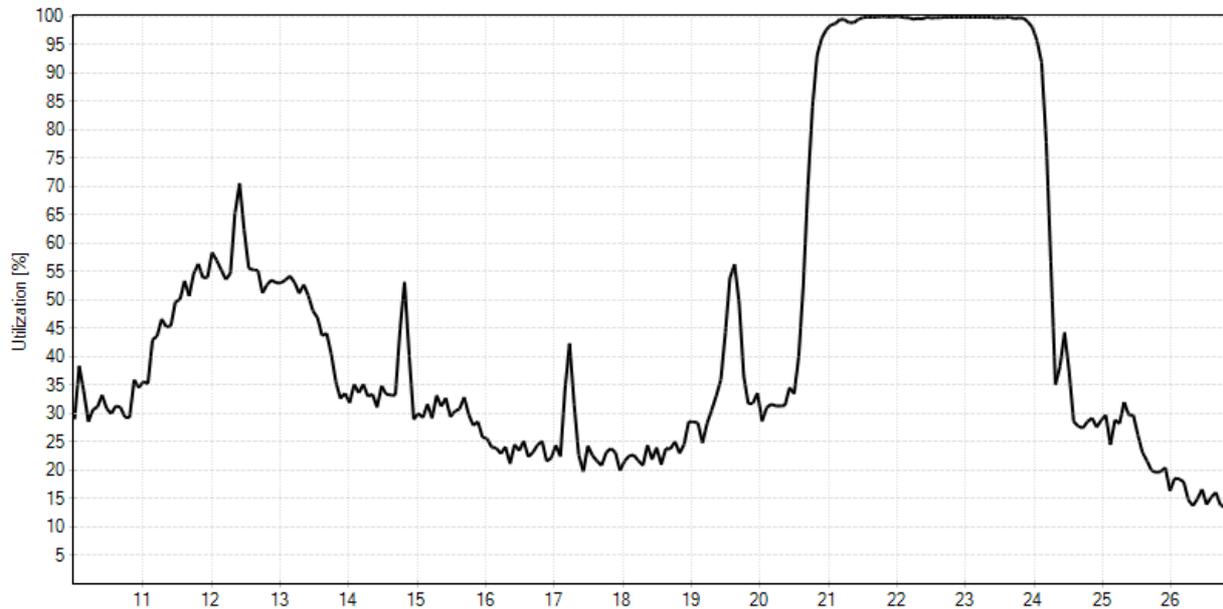
Based on what we know about identifying 802.11b and g networks, and what we know about identifying utilization, we can determine what is happening in the spectrum.

Two 802.11b networks are visible. An 802.11b network is talking to another device on channel 1 (the second device is closer to you, and is creating the tall green curve shape). The network on channel 1 is using more than 50 percent of the available airtime to talk.

The second 802.11b network is on channel 11, and is fairly close to the spectrum analyzer at this point during the recording. It is also using at least 50 percent of the airtime.

Network performance could be drastically improved by either disabling legacy 802.11b data rates on both access points, or by upgrading to modern 802.11g/n equipment. This will allow devices to say that they need to say faster, so they will tie up the channel for less time.

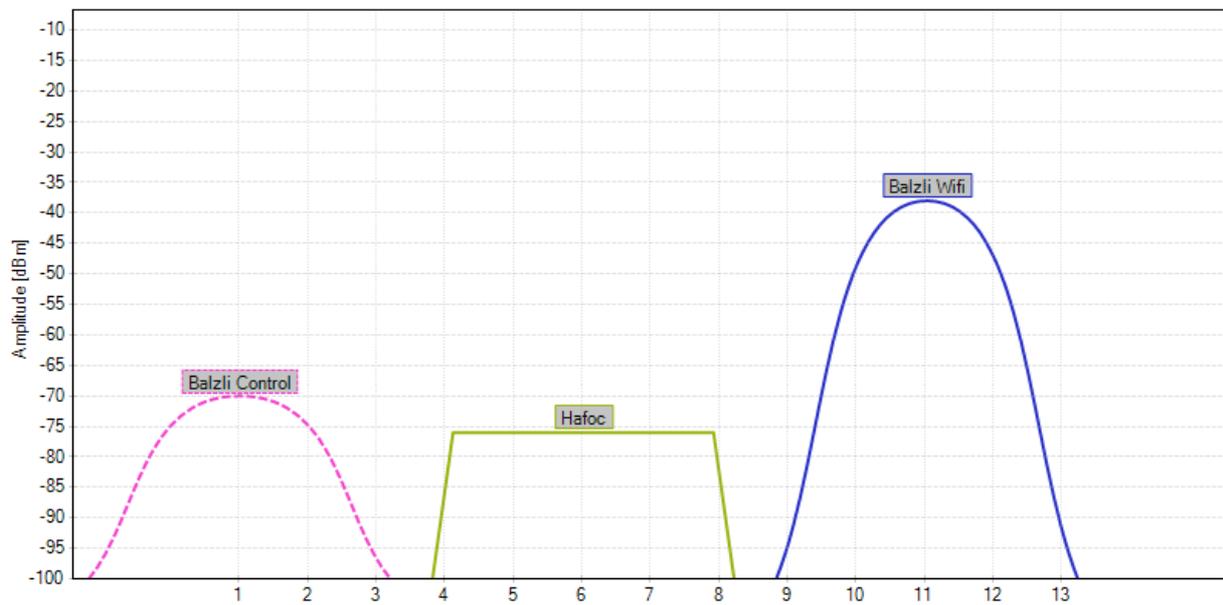
## Utilization Detail



Utilization measures the percentage of activity above a defined amplitude threshold. Utilization is similar to **airtime usage** and **duty cycle**. The **Utilization Graph** gives more exact representations of utilization in the spectrum than the Density View's approximations.

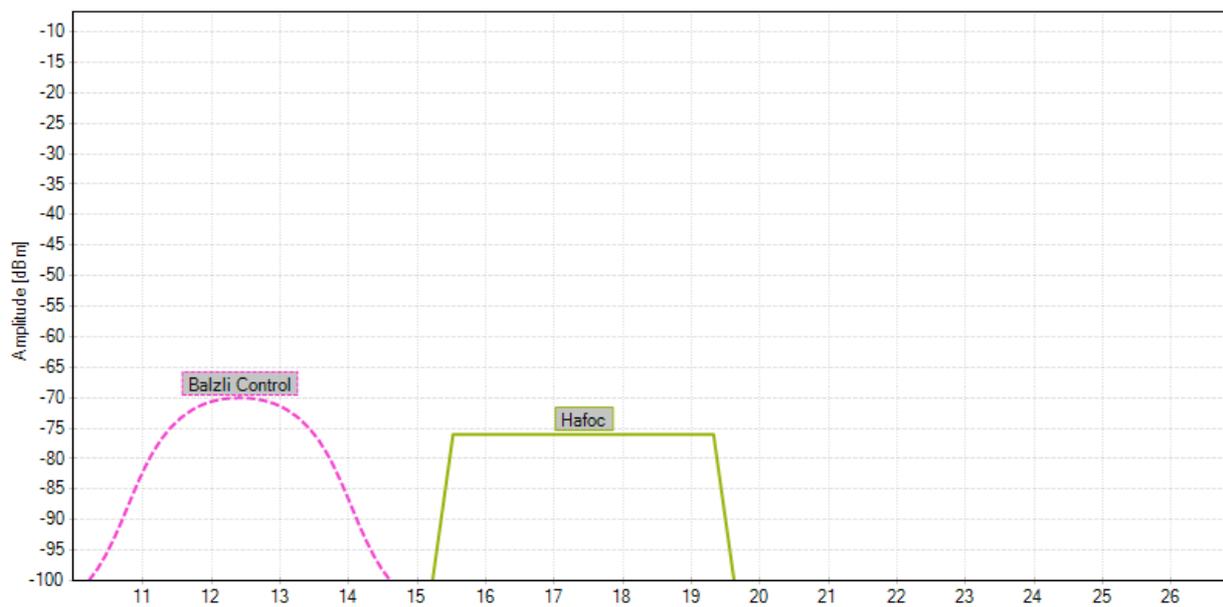
We can see here that the 802.11b network on channel 11 at the defined amplitude threshold of -85 dBm.

## Wi-Fi Networks



Your Wi-Fi networks are on Wi-Fi channels 1 and 11. While there are a couple of networks on channel 6, they aren't very close by. You could move your network on channel 11 to channel 6, which would give your ZigBee devices their very own channel to live on.

## ZigBee



With Balzli Wi-Fi moved to channel 6, ZigBee channels 21-26 would be available for use by ZigBee devices with no competition from Wi-Fi networks.

## Recommended Actions

- Disable legacy data rates on 802.11g/n access points to take advantage of faster data rates
- Replace 802.11b devices with 802.11n devices, if 802.11g access points are not present
- Move "Balzli Wifi on channel 11 to channel 6
- Move ZigBee devices to ZigBee channels 21-26 to avoid Wi-Fi interference