

Thank you for purchasing Wi-Spy! You are using Chanalyzer 3.0.

Interference Identification Guide

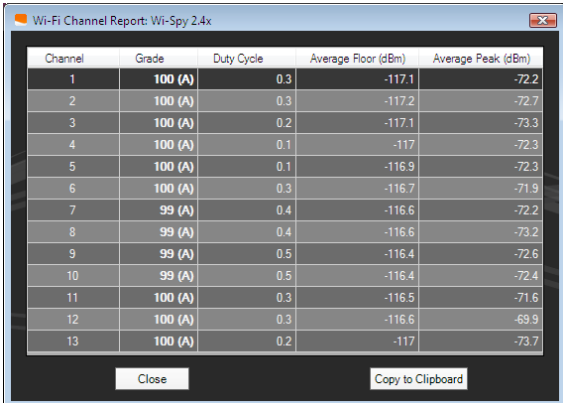
Troubleshooting with Wi-Spy is easiest with a laptop. Our Chanalyzer software requires .Net 2.0 (or higher), which runs on all recent versions of Microsoft Windows (Windows 2000 and newer). Third-party software for Linux and Mac OS X is also available.

Gathering Data

If you are doing a site survey before installing a new wireless network, or adding an access point to an existing network, it is useful to gather 24 hours of Wi-Spy data. Just plug-in the Wi-Spy, start Chanalyzer and let it run for a day. After the data has been collected by Chanalyzer we suggest saving the recording (select File > Save Recording As...), as it may be useful in the future for comparison. Wi-Spy Recordings (*.wsr files) require about 5MB per hour of recorded data.

Review the Recording

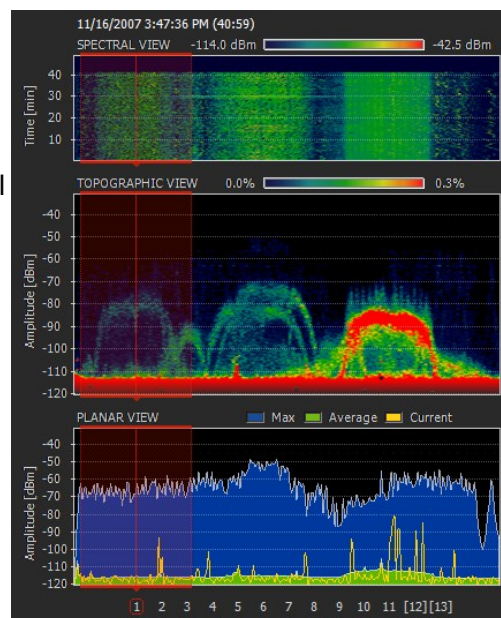
Chanalyzer can show up to 1 hour of data at a time allowing you to quickly skim through the 24 hour recording (this is easiest by just clicking on the playback track bar in hour increments). If you have a specific 802.11 channel that you plan to use change the X-axis labels to Wi-Fi and highlight that channel to make it easier to spot interference on that channel.



Channel	Grade	Duty Cycle	Average Floor (dBm)	Average Peak (dBm)
1	100 (A)	0.3	-117.1	-72.2
2	100 (A)	0.3	-117.2	-72.7
3	100 (A)	0.2	-117.1	-73.3
4	100 (A)	0.1	-117	-72.3
5	100 (A)	0.1	-116.9	-72.3
6	100 (A)	0.3	-116.7	-71.9
7	99 (A)	0.4	-116.6	-72.2
8	99 (A)	0.4	-116.6	-73.2
9	99 (A)	0.5	-116.4	-72.6
10	99 (A)	0.5	-116.4	-72.4
11	100 (A)	0.3	-116.5	-71.6
12	100 (A)	0.3	-116.6	-69.9
13	100 (A)	0.2	-117	-73.7

Chanalyzer also provides an analysis of all Wi-Fi channels. Select "Wi-Fi Report" from the Reports menu to obtain detailed information about each channel, including a composite "grade." The grade is a measurement of how quiet the channel is; the higher the grade, the quieter the channel.

The following screenshot shows Channel 1 highlighted. The red lines demarcate the boundary of the 22 MHz wide 802.2.b channel that is being used. The IEEE 802.11b standard defines 14 channels, although some channels are not available in certain countries. Cisco has a comprehensive list of 802.11a/b/g channel definitions as well as a table showing which regions allow each channel. (Note: Chanalyzer support for Channel 14 can be enabled in the File->Preferences dialog)



Identifying Interference Signatures

Chanalyzer provides visualization of your wireless landscape in three dimensions (frequency, amplitude, and time). By utilizing all three views in Chanalyzer most interference signatures can be quickly identified. Identifying device signatures is similar to identifying aircraft by their silhouettes in WWII to immediately determine if an approaching plane was friend or foe. The [Device Signatures](#) Library is a growing collection of recordings of common devices that you are likely to encounter.

With the ever-increasing popularity of Wi-Fi, you are likely to encounter neighboring Wi-Fi networks. There are a number of useful tools available to gather Wi-Fi-specific information, such as our free open-source [Inssider](#). This tool generally show you the network name (SSID), channel, signal strength, and type of security.

Features:

MetaGeek boosted the overall functionality of Chanalyzer by implementing a **sidebar** option and lengthening the record time.

- Chanalyzer 3.0 now records without any implemented time limit.
- After a little reorganization of the spectral, topographic and planar legends, Metageek added collapsible tools like: Signatures, Inspector, Notes, and Recording.
- Typical 2.4GHz device signatures are identifiable using the **Signatures** tool.
- **Inspector** will display frequency, amplitude and popularity of whatever point the mouse hovers over.
- **Notes** allows you to add time-specific annotations to interference instances in a recording.
- The frames in Chanalyzer 3.0 are re-sizable now, allowing users to prioritize their graphs.

Also, see how to use Metageek's latest software to better understand your Wireless Traffic: [Interference Identification Guide](#) or [Inssider](#).

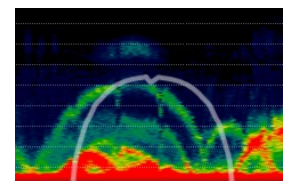
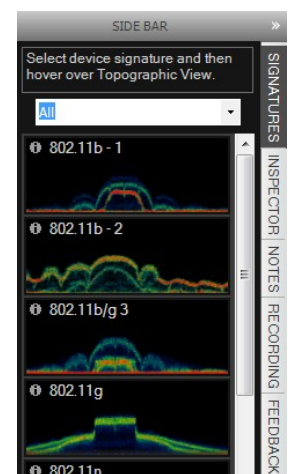
Troubleshoot:

Signatures

Signatures is one of the great new tools Metageek has implemented to help users identify shapes in the spectrum. When Signatures is selected on the right navigation tab, there will be several options listed; 802.11b, 802.11g, 802.11n, Uniden Cordless Phone, and Wireless Mouse/Keyboard.

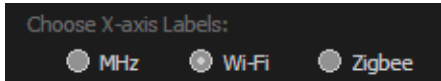
Note: Signatures requires [Wi-Spy 2.4x](#).

An overlay will follow the mouse over the topographic display, letting you match the shapes presented



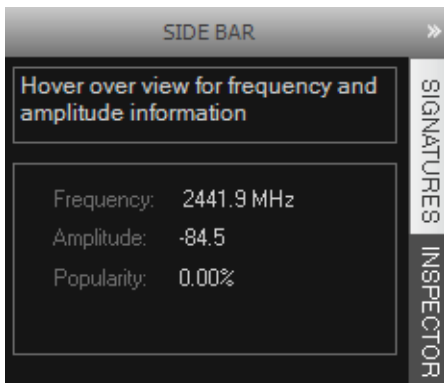
Visualization Tools

Axis Labels



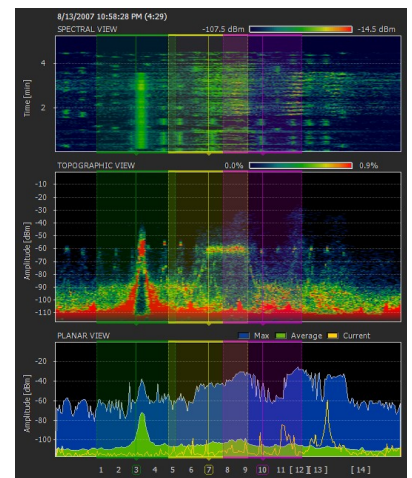
Show Frequencies

Click "Inspector" on the Side Bar. This will allow you to hover over a point in any of the displays to get the frequency, Amplitude, and Popularity. This function will work live, and on pause.



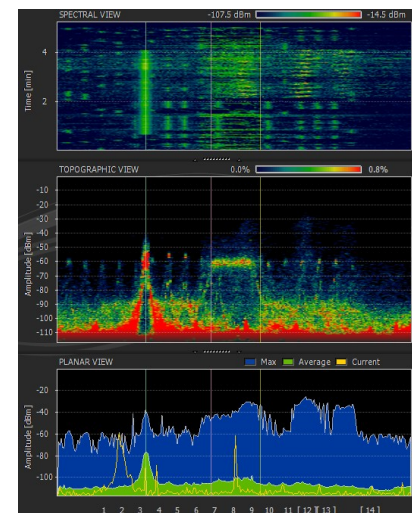
Channels

Make sure you have WiFi chosen on the axis label, then select one of the channels (1-11), and you will be able to display the general range the WiFi uses. You can use this to troubleshoot and visually see what channels generally overlap and where interference may possibly be occurring. To remove the overlay, simply click the channel on the axis label again.



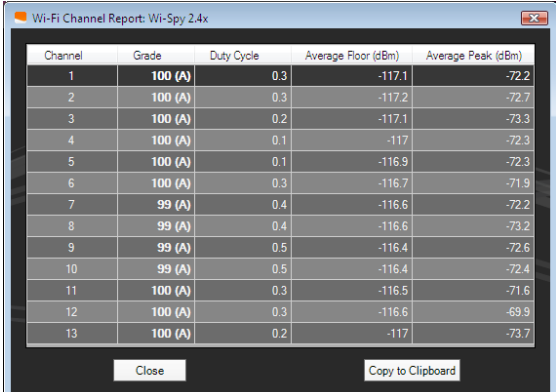
Markers

Chanalyzer 3.0 allows the user to mark certain points on the spectrum by double clicking. To remove them, simply double click on the marker you would like to remove.



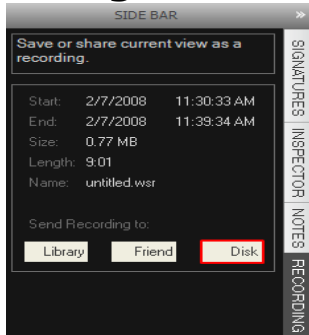
Reports

The Reports menu contains reports for Wi-Fi and Zigbee channels. The reports contain a synopsis of each channel, and a comprehensive grade. The grade is a measurement of how quiet the channel is; the higher the grade, the quieter the channel. The report can be sorted by any column by clicking on the column header. The report data can also be copied and pasted into a spreadsheet by clicking the "Copy to Clipboard" button.



Channel	Grade	Duty Cycle	Average Floor (dBm)	Average Peak (dBm)
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Saving Data As a Recording



Chanalyzer automatically saves all data in your default user temp directory. To save all (or part) of the saved data to a recording click the Sidebar > Recording > Disk ... A file dialog box open asking you for a file name. Click "untitled.wsr" to give it a new name. This will save the entire recording, or just the time selected. All signal strength data is recorded to a file along with the timestamp of each spectrum sweep.

Play a Recording

To Play a recording either double click on a recording file (*.wsr) or select File > Open Recording and select a recording file. You may also select a recently opened recording from the File > Recent Recordings submenu. A new tab will be created and the playback controls shown below will appear in the top right corner of the tab



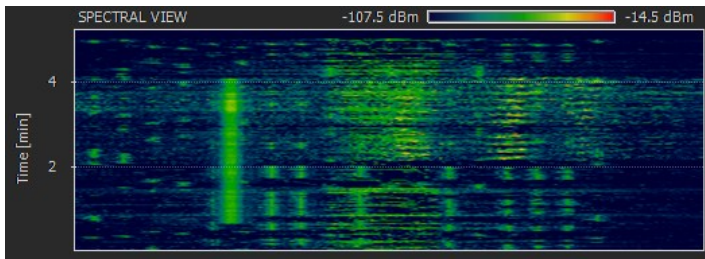
The elapsed time and current timestamp are both displayed on the left side. The right side contains the playback trackbar which can be clicked or dragged to easily navigate to anywhere in the file (When the mouse hovers over the playback trackbar a tooltip will display the elapsed time of that position). The playback trackbar also indicates the section of the recording currently displayed in the views (notice the red line that trails the play position indicator). To adjust the amount of data displayed in the views adjust the Timeframe. Below the slider bar are the following buttons:

- Rewind
- Pause
- Play (1x)
- Fast Forward (2x)
- Fast Forward (4x)

Display

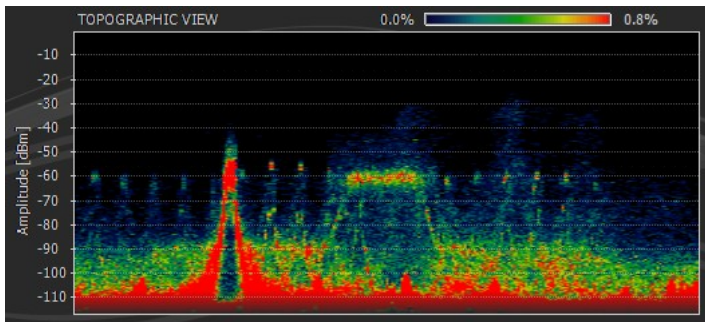
Spectral View

The Spectral View contains a waterfall graph that shows amplitude over time for each frequency. Based on the timeframe a row is added to the Spectral View every X seconds or minutes. The color of each frequency/time coordinate represents the amplitude of that frequency, with dark blue representing low amplitudes and bright red representing high amplitudes as shown in the legend.



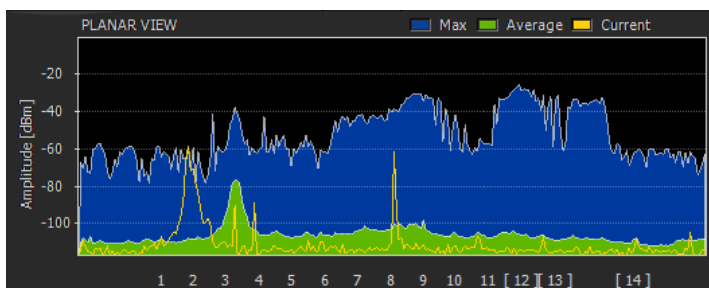
Topographic View

The Topographic View contains an amplitude over frequency graph similar to the Planar View, but instead of showing the current amplitude of each frequency it shows the popularity of each frequency/amplitude coordinate during the time displayed. The coloration of the Topographic View is similar to the Spectral View with blue being low and red being high, but the coloration now represents the "popularity" instead of the amplitude.

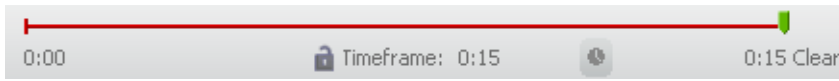


Planar View

The Planar View shows a typical amplitude over frequency display. The yellow line shows the current amplitude, the green shows the average amplitude, and the blue shows the maximum amplitude. Click the Current, Average, and Max labels in the Planar View controls to toggle the display of the corresponding trace. You can also press CTRL ALT M, A, or C to turn off the Max, Average, or Current display.

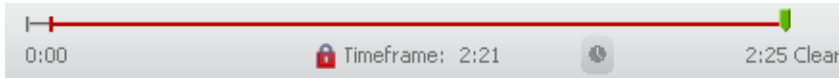


Timeframe



The timeframe controls how much data is displayed in the views. Each view (Spectral, Topographic, and Planar) shows a different look at the same data to help you better visualize your wireless landscape. For fast frequency hopping devices, a short timeframe works well; for wi-fi and other devices that do not change channels, longer timeframes tend to show a better "signature" in the Topographic View.

Locking the Timeframe



toggling between different lengths of recordings can aid you in your understanding of shapes of wi-fi activity. You can lock the timeframe by clicking the lock. Then if needed, adjust the length by grabbing the tail.

If you lock the timeframe, Chanalyzer will only display the length of time you have selected. This is a great tool to use while watching a fast frequency hopping device. The minimum display time is 30 seconds, and you can drag it to show whatever segment you wish.

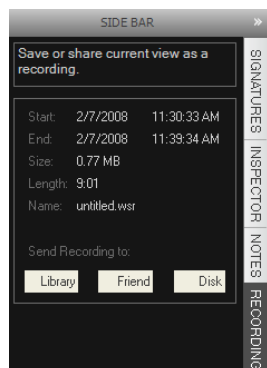
Share Recordings

Upload to Library

MetaGeek.net has a small, but growing library of downloadable recordings. There are recordings of everything from cordless phones interfering with wi-fi downloads to experiments with microwave ovens. We encourage you to share any interesting or unique recordings with the community by uploading them to the library.

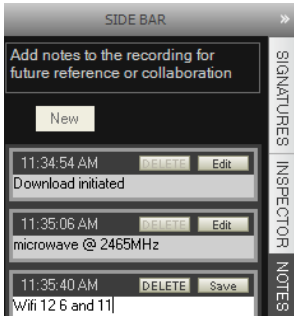
Send to Friend

Click "Send to Friend" to send a recording via email.



Notes

Chanalyzer is capable of storing notes associated with certain time points on the timeline. The user can either pause the recording, or while live display is going, press "new" and describe the event.



Notes are a powerful tool to bookmark interference in your chanalyzer recording. When using Insider, you can identify which WiFi networks are on what channels and note them accordingly. Embed these to the recording using the notes feature for future reference.

Notes are especially useful to MetaGeek, it helps us identify certain devices in your recordings.

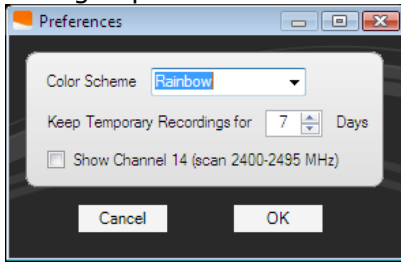
For examples of how notes can be utilized, please check out the sample recordings on the [webpage](#). Download, open the *.wsr in Chanalyzer, and then click on the notes tab!

Keyboard Shortcuts:

File Menu	
Ctrl + O	Open Recording...
Ctrl + W	Close Tab
Ctrl + S	Save Recording As...
Ctrl + Home	Preferences...
Alt + F4	Exit
View Menu	
Alt + S	Toggle Spectral View Display
Alt + T	Toggle Topographic View Display
Alt + P	Toggle Planar View Display
Ctrl + Shift + F	Show Frequency Labels
Ctrl + Shift + W	Show Wi-Fi Channel Labels
Ctrl + Shift + Z	Show Zigbee Channel Labels
Ctrl + C	Copy Image
Ctrl + Shift + S	Save Image As...
Help Menu	
F1	Open Help Contents
Planar View Controls	
Ctrl + Alt + C	Toggle Planar Current Trace Display
Ctrl + Alt + A	Toggle Planar Average Trace Display
Ctrl + Alt + M	Toggle Planar Max Trace Display

Preferences

By going to File > Preferences you can change the color options, and change Chanalyzer's temporary storage options. You can also press Ctrl + Home to access preferences as well.



Color Blind Option

MetaGeek implemented a color option in the preferences section to help our color blind customers. To use this feature, go to **file > Preferences** and then choose **"Purple"** color scheme in the drop down box.

