System Release 7.17
ASTRO® 25
INTEGRATED VOICE AND DATA

Interference Locator Feature Guide

NOVEMBER 2016

MN003305A01-A

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Document History

Version	Description	Date
MN003305A01-A	Original release of the *Interference Locator Feature Guide* manual	November 2016

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About Interference Locator Feature Guide

What Is Covered in this Manual

This manual contains information regarding the operation of the Interference Locator application which can be used to identify the approximate location of RF interference sources. It includes instructions on how to calibrate the system to produce more accurate results, as well as how to process existing events within the system once calibration is complete. Events can also be processed with an uncalibrated system if necessary. Lastly, it describes how to export processed interference events to a KML file which can be viewed on a PC or tablet with an application such as Google Earth.

Helpful Background Information

Motorola Solutions offers various courses designed to assist in learning about the system. For information, go to *http://www.motorolasolutions.com/training* to view the current course offerings and technology paths.

Related Information

For associated information, see the following documents:

Related Information	Purpose
Standards and Guidelines for Communication Sites	Provides standards and guidelines that should be followed when setting up a Motorola Solutions communications site. Also known as the *R56* manual.
System Documentation Overview	For an overview of the ASTRO® 25 system documentation, open the graphical user interface for the ASTRO® 25 system documentation set and select the **System Documentation Overview** link. This opens a file that includes: • ASTRO® 25 system release documentation descriptions • ASTRO® 25 system diagrams For an additional overview of the system, review the architecture and descriptive information in the manuals that apply to your system configuration.
Unified Network Configurator	Provides information relating to the implementation and management of centralized backup and restore services for supported devices in ASTRO® 25 systems. This manual addresses server and client functions required for these services.
License Manager	Provides information about the use of licenses to gain access to features and functions in ASTRO® 25 systems, including the installation of the License Manager in the system and instructions on using the web-based License Manager user interface to load, view, and manage licenses in the system.

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Chapter 1

Interference Locator Description

This chapter contains an introduction to the Interference Locator application.

1.1
Interference Locator Overview

Interference Locator is an application hosted on the Unified Network Configurator (UNC), which determines the interfering signal's approximate location and shows it on a map. The use of the application reduces service downtime and increases availability of channels because interference issues can be resolved more easily. Interference Locator can work with GTR8000 based trunked simulcast systems only (L and M core configurations). In Dynamic System Resilience (DSR) when both UNCs receive a trap, the active UNC receives the incident data and computes the approximate location of the interference, while the data is replicated to the inactive UNC. Detection is limited only to signals located within the receiving radius of at least three GTR8000 based subsites, all part of the same simulcast system site. It has an interference data retention of 250 incidents per site and 2500 per system - see Table 1: Interference Data Retention Limits on page 19.

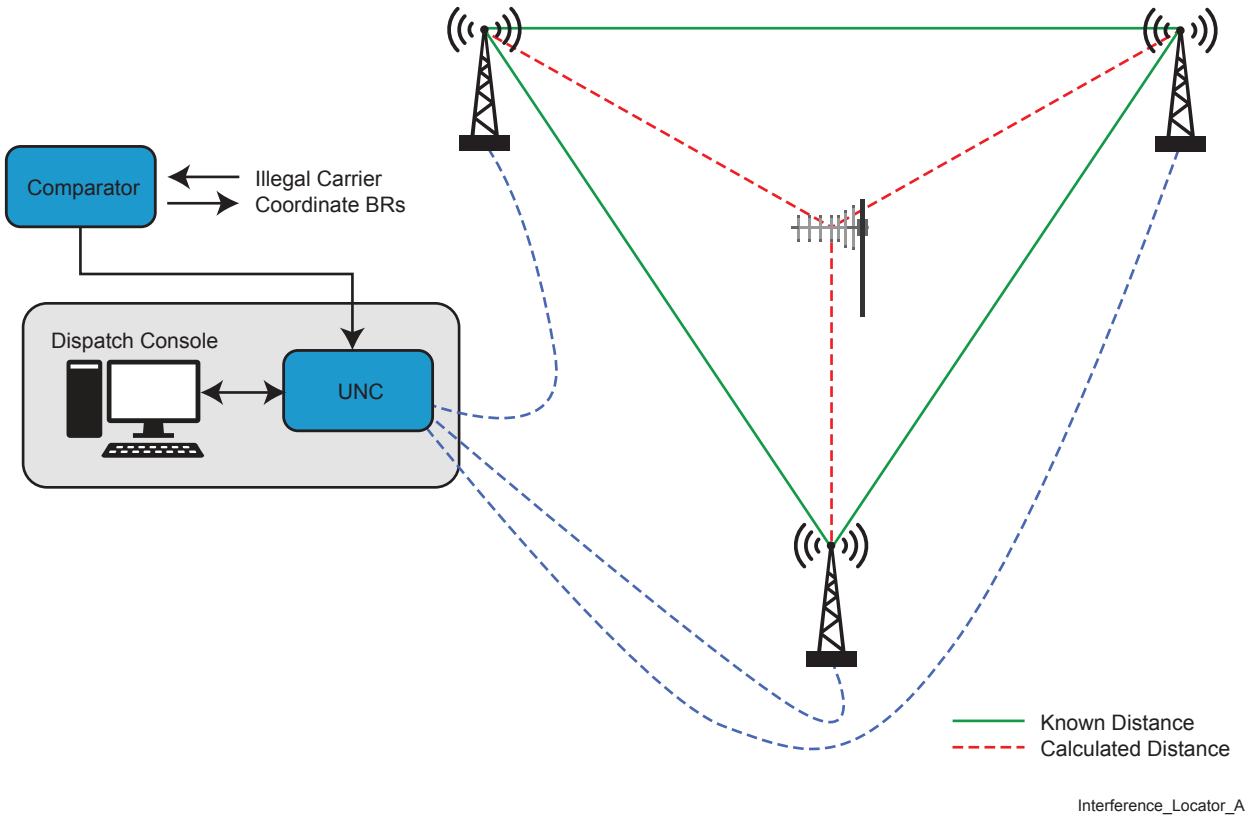
Table 1: Interference Data Retention Limits

	Unprocessed	Processed
Present release	250 / 2,500	250 / 2,500
7.16 SER 1, 7.17 SER 1 and later	250 / 2,500	10,000 / 100,000

The process of detecting the location of an Interferer can be summarized as follows:

- Any Base Radio within a simulcast trunked subsite detects an Illegal Carrier in its channel
- The Comparator coordinates all Base Radios that are part this channel to capture receiver data
- The Comparator informs the UNC of the captured incident
- The UNC collects the receiver data from all Base Radios belonging to this channel
- The UNC processes data and displays the interference location on a map.

Figure 1: Interference Location System Diagram



1.2
Interference Locator Features

Interference Locator can help you do the following:

- determine the interfering signal approximate location after a base radio detects an illegal carrier
- display the location of interference on a map
- limit the display of interference incidents by time of occurrence
- export the incident data to a KML file

The application offers Active Directory based authentication and authorization (including SSO, AD group).

1.2.1
Interference Locator Calibration

Initial implementation of the Interference Locator application recommends proper calibration performed in the field by trained personnel. Calibration process requires deliberate emission of interfering signals in the coverage area of the ASTRO® 25 system being calibrated. For each instance of such emission, exact time and location should be noted, thus allowing later identification of the triggered events in the UNC Unprocessed Events view. To complete the calibration, the noted location data are manually added to the corresponding, identified logs.

The calibration process may or may not need to be repeated as specified in the following cases connected with system expansion:

- Base Radio replacement

- addition/removal of a channel
- subsite location change
- addition/removal of a subsite

Calibration Override

It is possible to omit the calibration process, if less accurate results are acceptable. The errors that the calibration process eliminates are mostly differences in the timing within the Base Radios. If the user accepts a decrease in accuracy of the interference location of tenths of a mile, depending on the location of the interference, then the calibration process can be skipped. The calibration process can be skipped by setting a channel to default calibration to enable running the analytics without calibration for that particular channel.

CAUTION: If you skip calibration, the gathered location data for the interfering signal can be less accurate for interference analysis.

Base Radio Replacement

When a Base Radio is replaced or the radio is changed to another channel or subsite, the new radio cannot make use of the calibration intended for the retiring Base Radio. The new Base Radio is considered uncalibrated. The channel containing the new uncalibrated Base Radio can be set to default calibration mode for immediate use. The new radio can then be calibrated at a latter time.

Addition of a Channel

A new channel will be considered uncalibrated and the normal calibration procedures for this new channel apply.

Removal of a Channel

Removal of a channel does not require any new calibration; the system remains as before the removal.

Subsite Location Change

When a subsite location is changed, and all the Base Radios are re-used from the previous location and were previously calibrated, there is no need to re-calibrate the subsite. But the subsite location needs to be updated in the UNC Wizard.

Addition of a Subsite

When a new subsite is added, all the Base Radios are considered uncalibrated. This causes all the channels in the new subsite to be uncalibrated. Normal calibration procedure of the subsite apply, all other subsites need not be re-calibrated.

Removal of a Subsite

Removal of a subsite does not require any new calibration; the system remains as before the removal.

1.2.2 Interference Locator Data Interpretation

Data

The data generated by the processing of a detected Illegal Carrier, also called an incident, is intuitive for the most part and requires a minimal level of interpretation. Table 2: Incident Interpretation on page 22 lists details on how to interpret the data presented in the map view of the Interference Locator in

order to narrow down the location results and to identify the real source of the interfering signal with the highest accuracy.

Each incident is represented as an icon on a map. When hovering over the incident icon with the mouse pointer, the following information is displayed minus the explanation:

Table 2: Incident Interpretation

Item	Explanation
Date	Date Date of incident
Time (Local)	Time (Local) Time of incident
Zone	Zone where incident was detected
Site	Site where incident was detected
Channel	Channel RF channel where incident was detected
Rx Frequency	Receiver RF frequency of Channel
Latitude	Latitude of incident
Longitude	Longitude of incident
Num of Triangulations	Number of Triangulations measure of quality, the higher the better
Maximum Correlation	Maximum Correlation measure of quality, the higher the better
Average Correlation	Average Correlation measure of quality, the higher the better
Interference Maximum RSSI	Maximum RSSI of all participating subsites
Illegal Carrier Minimum BER*	Lowest BER of all participating subsites if interference is APCO 25 modulation
Network Access Code (NAC)*	NAC if interference is APCO 25 modulation
Subscriber Radio ID*	Subscriber Unit ID if interference is APCO 25 modulation
Rx Protocol*	Rx protocol if interference is APCO 25 modulation
Site NAC Indication*	NAC matches system or not if APCO 25 modulation

NOTICE: * This information is present only for releases 7.16 SER 1 and 7.17 SER 1 and later.

Map

Atmospheric and environmental conditions may cause successive measurement results of the same interference source to vary around the actual location. To mitigate these varying conditions, several measurements are taken on the same interference when possible, outliers should be ignored by the user and the rest should be visually averaged.

When seeing a cluster of incidents generated by the same interference, the user needs to do a mental average of these incidents to determine the most likely location of the interference.

As an example, using the exported KML file with Google Earth on a 9 subsite system, we see that by ignoring outliers “A”, “F”, and “H”, a very accurate averaged measurement was made in this particular system, at this location, under those conditions.

The blue star and the interference green target are normally not displayed, but are shown for illustration in the following graphic.

Figure 2: Map Visualization

1.2.3
Interference Locator Accuracy

There are various factors affecting the accuracy of detection of the interference location such as:

- terrain topography
- atmospheric and vehicle traffic conditions
- duration of interference
- power level of interference
- calibration accuracy
- number of subsites
- location of interference relative to subsites
- accurate location of subsites

Terrain Topography

The best performance can be obtained in a landscape with minimum obstructions such as no buildings or low buildings as can be found in rural or suburban areas. Areas with higher obstructions will degrade the accuracy of the measurements such as in urban canyons and unusually mountainous terrains. The accuracy is also dependent on the location of the subsites and height of subsite antennas in relation with the geography and obstructions.

Atmospheric and Vehicle Traffic Conditions

The accuracy of incidents is affected by constantly changing atmospheric conditions and traffic patterns as well as individual passing vehicles. This can be partially overcome by taking several measurements on the same interference source and determining their average. Any outliers, as determined visually, can be ignored when visually determining the average.

Duration of Interference

A long lasting interference can allow for several measurements that will contribute to the average of incidents for increased accuracy. The interference need not be continuous and can provide a large number of incidents even if the interference is intermittent.

Power Level of Interference

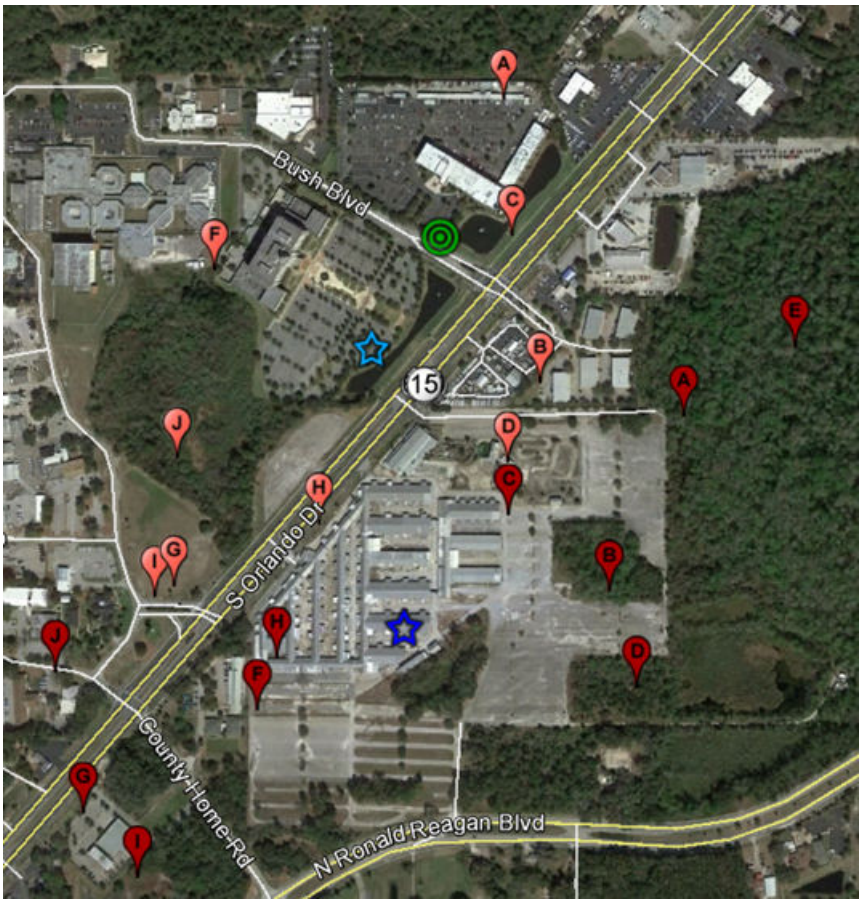
The power level of the interference is a factor in the determination of its location. Sufficiently high power levels will result in an optimal interference location estimation. Power levels reaching the participating subsites above -110 dBm will result in optimal location determination. The minimum power requirement for at least one participating subsite is -110 dBm, all other subsites can work with power levels as low as -120 dBm.

Calibration Accuracy

Calibration can improve the accuracy of the estimated location of the interference. The level of improvement can vary depending on the delay variations of the receiver hardware involved in the measurement. Also the location of the interference in relation to the participating subsites plays a factor.

As an example of the contribution to accuracy due to calibration using a 9 subsite system in a suburban/rural landscape, the accuracy moves from 0.3 to 0.1 miles. The dark red incidents are determined without calibration and their average is represented by the dark blue star which, in this example, is 0.3 miles from the interference (represented by the green target). The light red incidents are determined with calibration and their average is represented by the light blue star which in this example is 0.1 miles from the true interference on the size of the error reduction.

Figure 3: Example of Improved Accuracy with Calibration



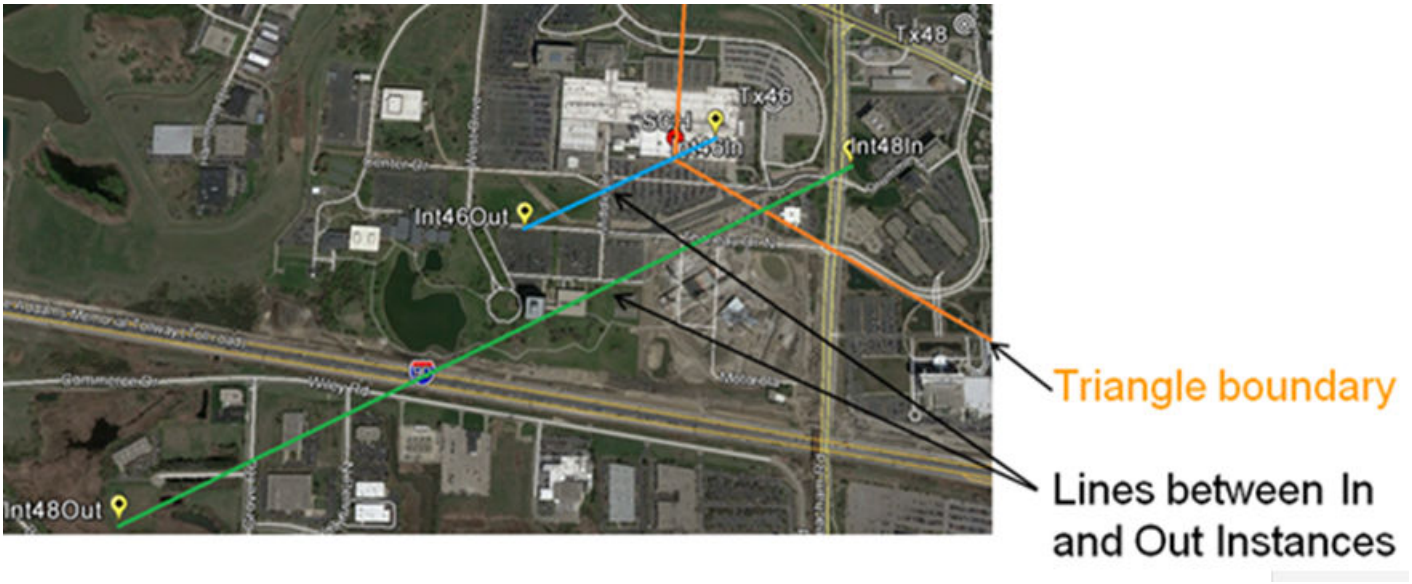
Number of Subsites

The minimum number of subsites required for finding the location of interference is three. The higher the number of subsites the better the accuracy of the interference location with diminishing returns beyond 8 subsites.

With three participating subsites, and the interference source at specific locations, it is possible the Interference Locator feature is unable to determine the single true location of the interference and provide two possible locations. These specific interference locations are for the most part close to a corner of the three subsites. The actual map will not show the lines between the In and Out detections, these are for illustration purposes.

An example of double detection is shown in Figure 4: Example of Dual Detection on page 26 as Tx46 with Tx46Out and int48In and Int48Out:

Figure 4: Example of Dual Detection



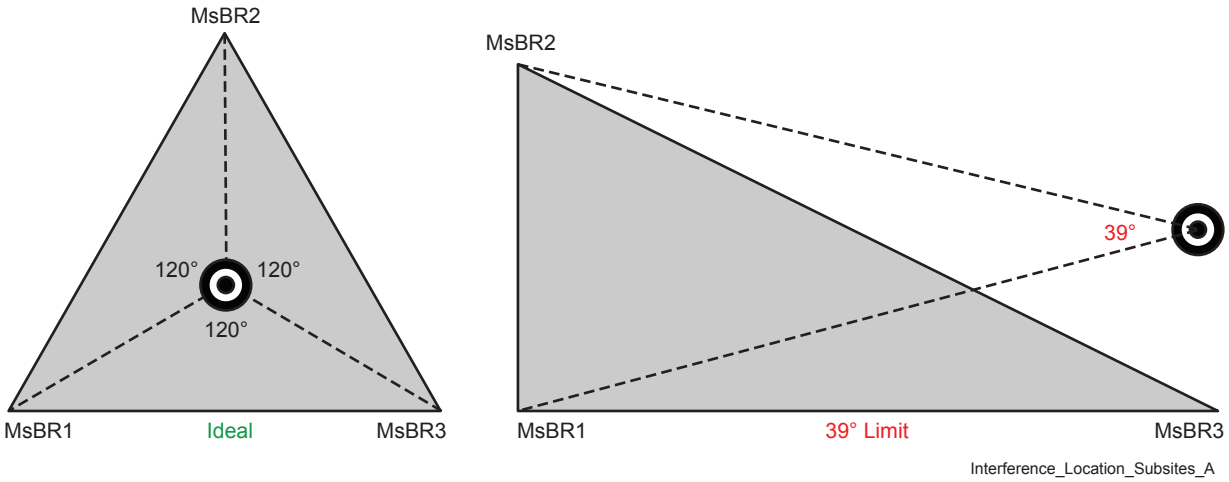
Location of Interference Relative to Subsites

The location of the interference is a factor in the accuracy of the measurements. An equilateral triangle formed by three subsites with the interference in the middle is an ideal location as shown on the left figure.

As shown on the right diagram, the location of an interference that is far away from the subsites experiences degraded performance. The point of degraded performance starts when the angle between the interference and two equidistant subsites falls below 39 degrees. This limitation is more apparent at the edge of the system coverage. In a system with more than three subsites and in a more centric area of coverage the interference location can be determined by other subsites that are in a better position to determine its location.

Subsites located along a straight line or close to a straight line will have difficulty in accurately detecting the interference locations.

Figure 5: Location of Interference Relative to Sub-Sites



Accurate Location of Subsites

The location of each subsite is used by the UNC analytics in calculating the location of the interference. An inaccurate subsite location in the UNC Wizard at the Site Level Configuration under Site will result in inaccurate calculations of the interference location.

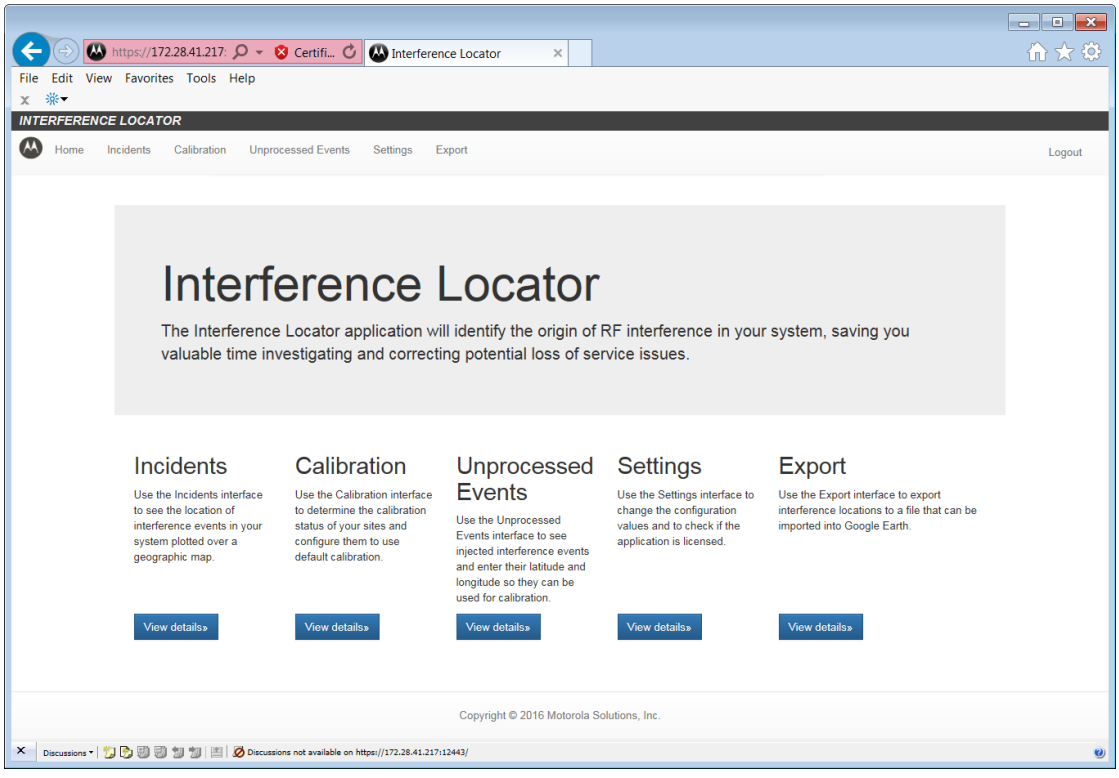
1.3 Interference Locator User Interface

The Interference Locator application is composed of several views. These views are listed in the following sections with an explanation of their purpose and how to use each view.

1.3.1 Home View

This interface is the landing page for the application. It is the page one sees once successfully logged in to the application. It also includes paragraphs for explaining each of the capabilities/features of the application; Incidents, Calibration, Unprocessed Events, Settings and Export.

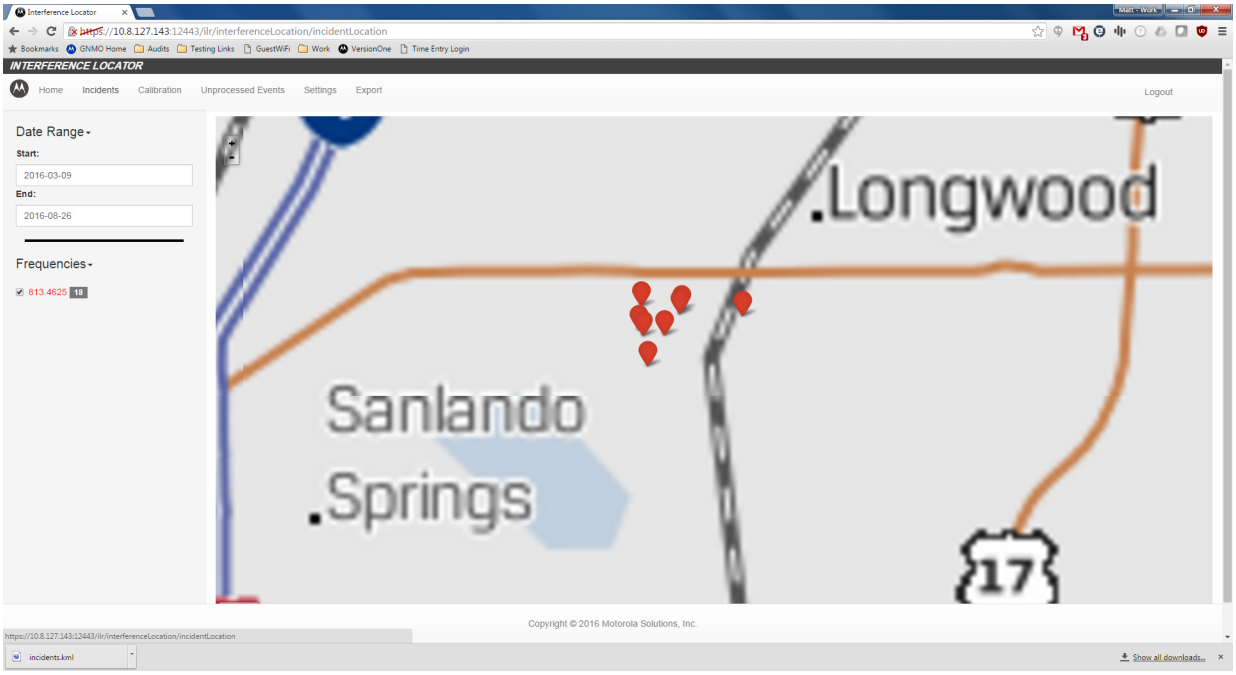
Figure 6: Home View



1.3.2 Incidents View

The Incidents view displays the location of all sites in the system as well as calculated interference incident locations over-layered on a geographic map. The user is able to select the date range of the incidents to be displayed using the Start and End fields on the left. The user can also select the channels to be displayed. Map icons are color-coded to reflect the channel of the interference incident. The user can select one or more channels to be displayed on the map simultaneously, by clicking on the checkbox in front of the channel list on the left. Note: map tiles must be loaded separately using the GDI tool. The following Figure 7: Incidents View on page 28 shows an example of a map.

Figure 7: Incidents View

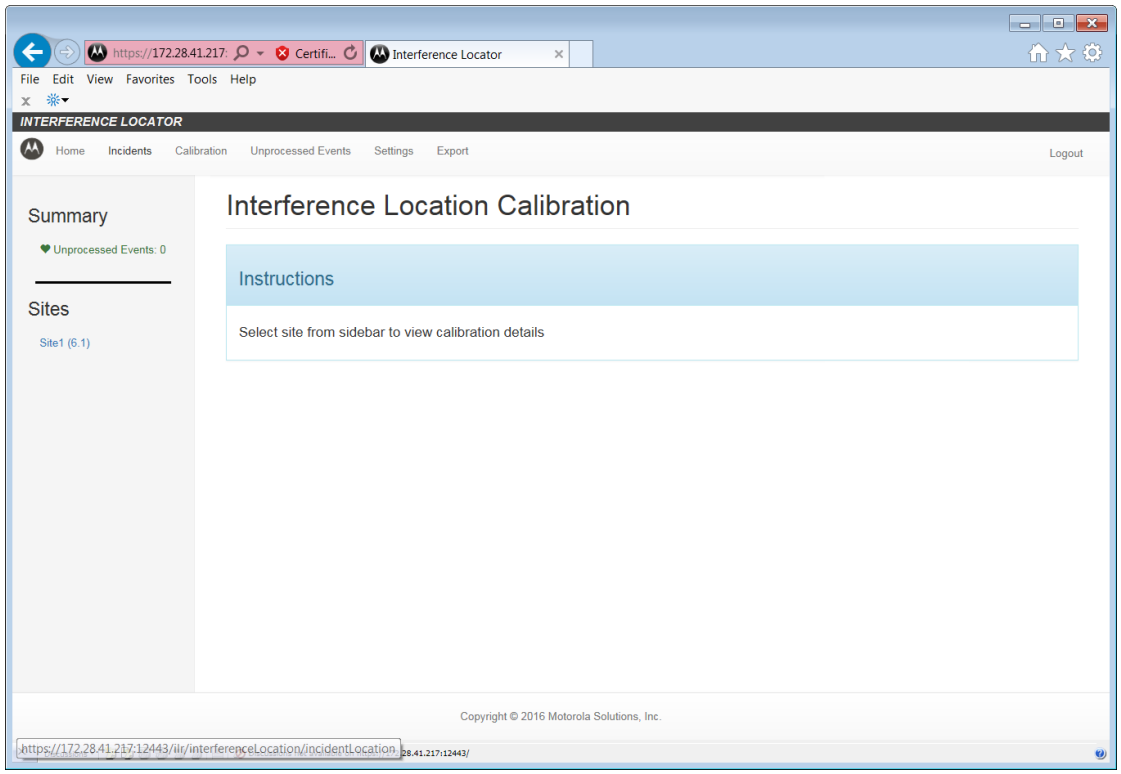


1.3.3
Calibration View

This view displays the current calibration status of the system as UNCALIBRATED, DEFAULT, or CALIBRATED. The upper left portion of the screen displays a summary of the number of Unprocessed Events. By selecting a site on the lower left portion of this view, the user can see the list of channels for that site and the calibration status of each channel. From this list, the user can select a channel or channels, and click on the **Set Calibration To Default** button to change the calibration status to default calibration. Channels with default calibration can be used to process events but channels with UNCALIBRATED state cannot process events.

This view also allows access to the Channel Calibration Status screen to view the details of the calibrations in process by clicking on the **Info** link. In order for a channel to be calibrated, a sufficient number of injected events must be processed. This screen allows the user to see the results of previously processed events to determine the appropriate location to inject additional events to specific channels and subsites, in order to complete the calibration process.

Figure 8: Calibration View

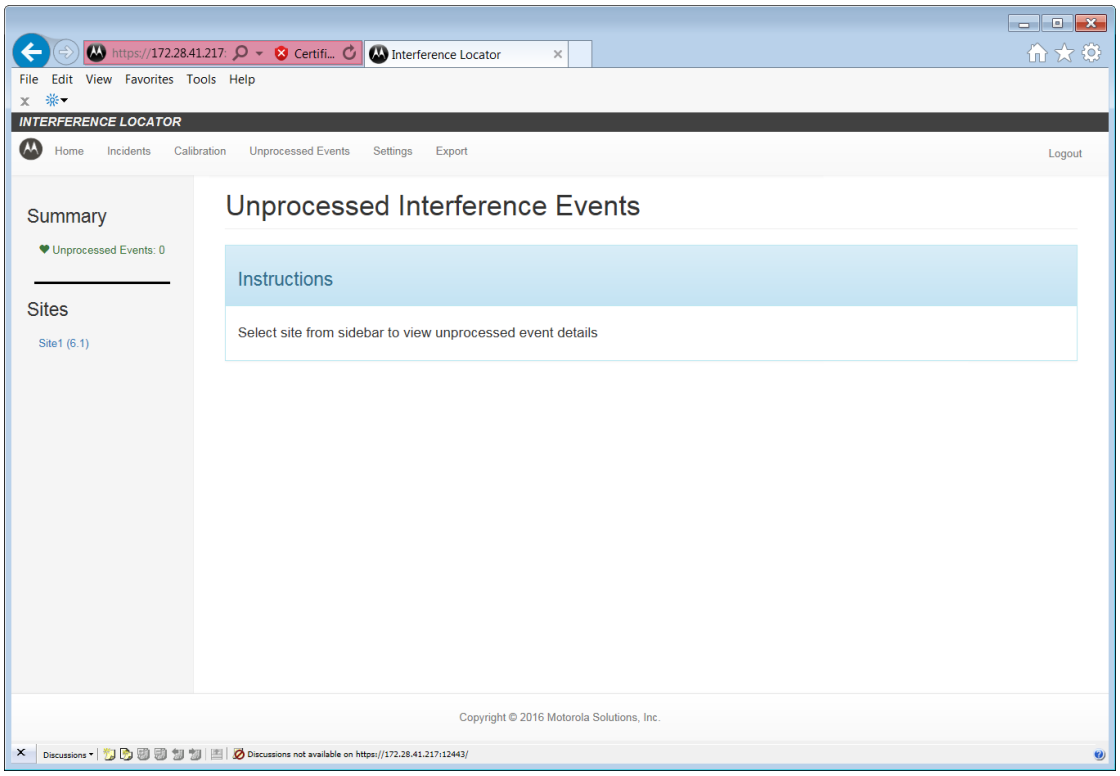


1.3.4

Unprocessed Events View

This view displays a list of unprocessed events. Unprocessed events are either events that were injected manually for calibration purposes, or real interference events that cannot yet be processed because the corresponding channel has not been calibrated, nor has the channel been set to use default calibration. From this interface the user can select a site on the left, and see the list of unprocessed events displayed at the bottom. The user can select an event that was manually injected, enter the appropriate Latitude and Longitude values in the upper portion of the screen, and apply these values to the event. These values will be utilized by the Calibration process by selecting the events and pressing the **Process Event** button.

Figure 9: Unprocessed Events View



1.3.5
Settings View

The Settings view allows the user to view and modify parameters used in the analysis of the incident data to determine the location of the incident. The Selectivity value has a default value of 0.08 and a range of 0.08 to 1.0. It is used to determine the lowest quality of individual incidents that are acceptable for display. Increasing the selectivity value results in fewer incidents but with higher quality. The Minimum RF RSSI field has a default value of -110.0 and a range from -110.0 to 0.0.It is used to determine the lowest power level acceptable to compute individual incidents. This value is only applicable to the highest RSSI value of all the sub-sites, all other sub-sites can have an RF RSSI value down to -120 dBm to participate in the computation of location. Increasing the RF RSSI will result in fewer incidents but with higher quality. These values should not be modified from their default values without the consultation of an expert.

If there is a high number of interference sources detected, one may increase the RSSI threshold in the Settings View to screen out lower power interferences and focus first on the higher power interference.

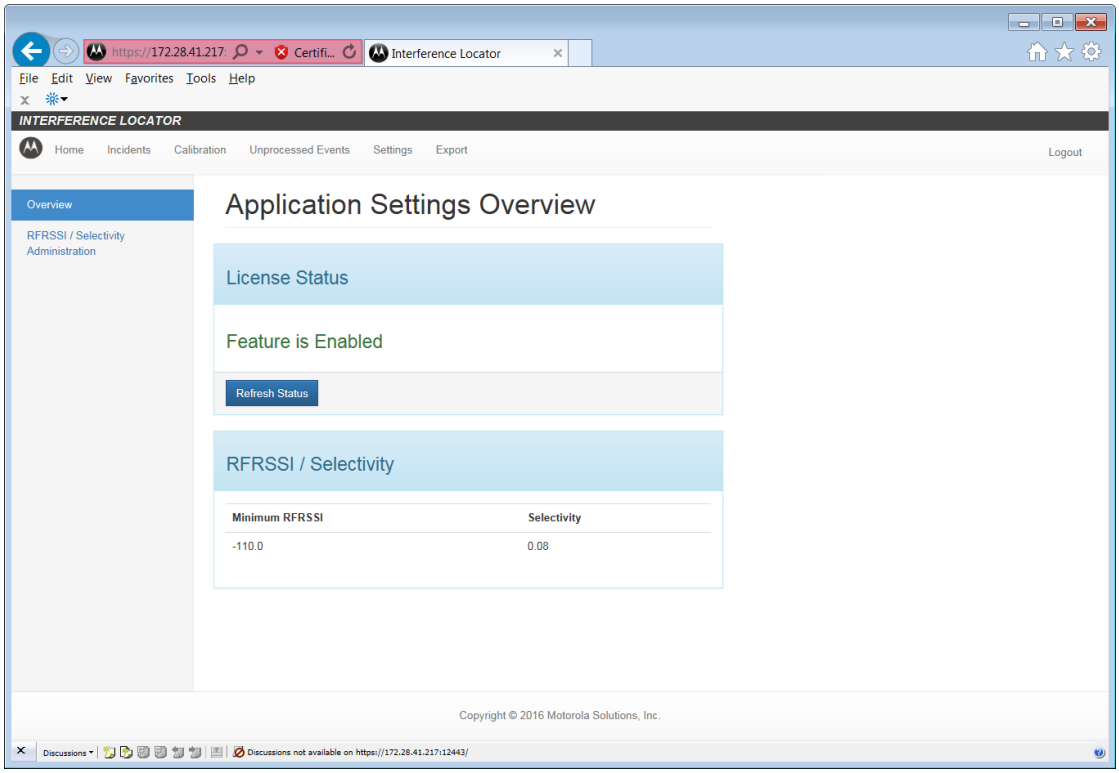
To update the values, click on the **RFRSSI / Selectivity Administration** menu option on the left, and then tab to or click in the desired field and modify the value. Click on the **Submit** button to save the modified values.

The minimum RSSI used is also dependent on the Illegal Carrier RF Threshold Value found under the Station Configuration via Base Radio CSS. The highest power of these two RSSI values establish the low power threshold of the illegal carrier that can be detected since an Illegal Carrier event has to be generated to prompt the Interference Locator incident.

Additionally this view displays the current License Status of the application and allows the user to refresh this status. Refreshing the status is only necessary when a license has been added/updated/ deleted on the License Server after the Interference Location application has been enabled.

To refresh the License Status, click on the **Overview** menu option on the left, and then click on the **Refresh Status** button. The system will retrieve and display the new License Status.

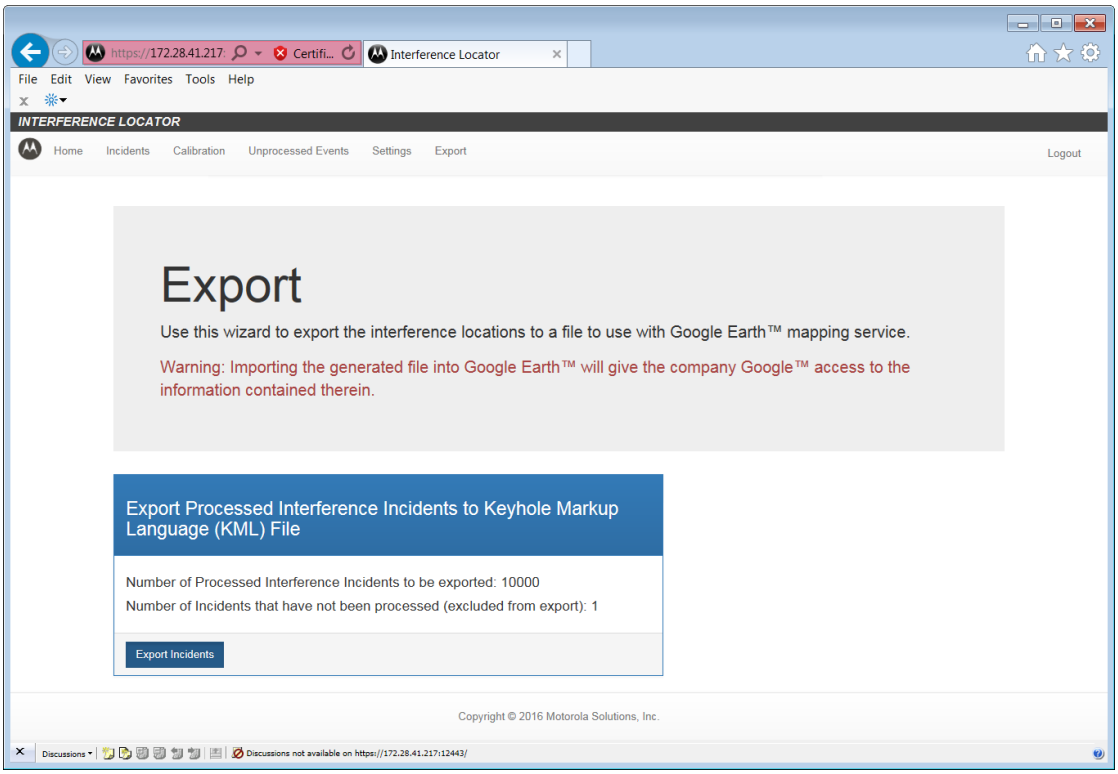
Figure 10: Settings View



1.3.6
Export View

This view provides the user the ability to export the interference locations to a Keyhole Markup Language (KML) file to be used with the Google Earth mapping services for increased map resolution and portability. The view shows the number of interference events that will be exported. See Exporting KML Files on page 38.

Figure 11: Export View



Chapter 2

Interference Locator Installation and Configuration

This chapter contains information on how to implement the Interference Locator feature in the system.

Interference Locator is installed along with the UNC and the site software and only needs to be enabled and configured. No specific installation procedures are necessary.

2.1 Enabling Interference Locator

Prerequisites:
Enable SNMPv3 Authentication and Privacy (AuthPriv) settings for the site equipment. See “SNMPv3 Configuration” in the *SNMPv3* manual.

Define the location of the sub-sites in the UNC Wizard at the Site Level Configuration under Site or by using the GDI tool to import the locations from a CSV file. The location of each sub-site is used by the UNC analytics in calculating the location of the interference. An inaccurate sub-site location in the UNC Wizard will result in inaccurate calculations of the interference location.

When and where to use:
Perform the following actions in every site.

Procedure:

1. In the UNC Site Wizard, enable the Interference Locator feature and set the Hold Off Timer parameter.

   The Hold Off Timer allows you to adjust the minimal time between interference location sample events. (range of 10-1200 seconds; default - 60 sec)

   A very low value of this parameter may result in multiple incidents from the same source being reported too frequently and thus not providing the UNC with enough time to upload all the incidents, resulting in event failures. Recommend the hold off timer minimum to 10 seconds plus 5 seconds per sub-site to give the UNC time to upload the files and avoid file overwrite at the MsBR. The hold off timer can also be used to minimize the number of incidents collected from the same interference by using a higher value.

2. Obtain the appropriate licenses for the Interference Location analytics feature. See the *License Manager* manual.

   Without the license, you can calibrate the Interference Locator, therefore enabling the system to gather the interfering signal location. No interpretation of the gathered data to provide the locations for the interfering signal is possible in such a case.

3. Verify the desired minimum RSSI used to detect Illegal Carriers found in the Base Radio CSS Station Configuration Illegal Carrier Determination (default = -90 dBm). The RF Threshold Value is the minimum power that a Base Radio will detect Illegal Carriers.

4. Verify that the Illegal Carrier Determination found in the Base Radio CSS Station Configuration is enabled to prompt the Interference Locator incidents. The detection of Illegal Carriers and disablement of the channel is used as a trigger to generate Interference Location Incidents.

5 Verify the time desired to declare an Illegal Carriers found in Base Radio CSS Station Configuration Malfunction Timer Value (default = 50 seconds). This is the minimum time required for the Base Radio to detect Illegal Carriers and disable the channel.

2.2 Licensing Interference Locator

The Interference Locator is a licensed feature. The user will be able to access all views and see unprocessed interference events. But will be prevented from processing events unless the feature has been licensed. To license the Interference Locator feature, the appropriate license must be added to the License Manager (See the *License Manager* manual for more information).

2.3 Backup and Restore

The Interference Locator data is incorporated into the UNC server backup and restore. Therefore, all incidents, calibration results, and settings are backed up whenever the UNC server is backed-up. Likewise, a restore of the UNC database will also restore all of the Incidents, calibration, and settings that were in place when the backup was completed.

Chapter 3

Interference Locator Operation

This chapter describes how to use the Interference Locator feature to calibrate the interference analysis components and analyze the interference signal location data to provide higher system availability.

3.1 Logging into the Interference Locator Application

Prerequisites: Ensure the user account you want to use to access Interference Locator is assigned to the group with permissions to use the application.

Procedure:

1. Launch Internet Explorer and go to `https://<ip unc>:12443/ilr/`

   An Interference Locator login window appears.

2. Type your username and password.

3.2 Calibrator Operations

This section describes how to calibrate the Interference Locator application, so that it provides increased accurate location data of the interfering signal.

To calibrate a channel or channels, the channels need to be disabled to normal traffic to avoid interference with the calibration process.

Calibrating the Interference Location feature is needed for the Interference Locator feature to calculate a more precise location. All channels at all sites need to be calibrated, and therefore the process may be time-consuming.

Calibration can be performed by one person. However, time can be saved by having one person generate the calibration interference instances while a second person processes the incidents at the UNC and provides guidance as to what channels and sub-sites need more calibration interference instances. With two persons, steps 2 and 8 can be done simultaneously without excessive event generations.

3.2.1 Calibrating Interference Locator

Prerequisites:

IMPORTANT: This procedure should be performed by the system administrator only.

Repeat the procedure multiple times on each channel to cover all subsites and for each RF site within the multi-site system.

Ensure the user account you want to use to access Interference Locator is assigned to the group with permissions to use the application.

Procedure:

1. Transmit RF interference with a mobile (recommended) or portable radio at pre-determined locations, in accordance with the following rules:
   - Interfering Radio - this radio can be configured as a conventional radio with a NAC (Network Access Code) that does not match the system NAC and transmits on the inbound RF frequency of the channel under test.
   - UNC Interference Locator Settings view - leave the Selectivity as default value of 0.08 and the Minimum RF RSSI field has a default value of -110.
   - MsBRs - Set the Illegal Carrier Detect level to -110 dBm and detect time to 5 seconds on all participating MsBRs via the UNC. These parameters can be found in the Base Radio CSS Station Configuration Illegal Carrier Determination (default = -90 dBm) and Base Radio CSS Station Configuration Malfunction Timer Value (default = 50 seconds).
2. Generate Calibration Incidents

   Using the interfering radio, transmit in the middle of the coverage area of participating subsites for 12 seconds while not moving. Do not transmit near any sub-site location. Record the latitude, longitude and start time (hh:mm:ss) using a smart phone GPS application or similar. A copy and paste of the location and time stamp to a document works very well.
3. Wait at least the hold-off time, counting from the start of the transmission to give the UNC time to upload the files and avoid file overwrite at the MsBR.
4. Repeat step 1 and step 2 at least 20 times at locations about a 1/4 block away from each of the previous transmissions or until the trio or trios of subsites show sufficient calibration events, that is greater than 6/12. This is one set of transmissions. This is done for each channel under calibration. Doing all channels and locations at the same time saves calibration time.
5. Record the latitude and longitude of each interfering transmissions to be used to associate the incident location to the incident recorded at the UNC using the time stamps.

   NOTICE:
   Using a portable instead of a mobile for calibration will require more data locations and points and will significantly increase the calibration time.

   For larger sites with 5+ sub-sites, more than one set of transmissions at different locations might be needed to reach all sub-sites with a power level sufficient for calibration. Use the Interference Locator Calibration Wizard to obtain feedback on what sub-sites need more calibration interference events.
6. In the Interference Location application, log in as Calibrator.
7. In the Unprocessed Events view, select the site from the side bar.

   Interference events associated with this site are displayed.
8. Add the location for the events that are being used for calibration:
   a. Click the check box on an incident intended for calibration to enter its location.
   b. Enter the latitude and longitude for the injected event and associate with the time stamp, take into account that the smart phone time stamp and UNC time stamp may be offset by a few seconds when matching incidents with locations.
   c. Click the **Set Location of Selected** button to update the location for the selected event.
9. Select all instances with entered locations, after all event locations have been added.
10. Click the **Process Events** button to process the events to calibrate the channels.
11. Under the tab “Calibration” analyze the calibration results for every channel (CALIBRATED vs. UNCALIBRATED).

For those channels that remain UNCALIBRATED, observe the number displayed as k/n. The k/n number required for calibration is 6/12, meaning it is required to have at least 12 valid interference instances (n) and 6 interference instances (k) remaining after processing. Example of incomplete calibration would be 3/15, 0/11, 2/20.
A successful calibration result would display a single line with the calibration result under the “info” page. Two or more lines means that there are not sufficient events linking all trios and the two or more subgroups of subsites require additional interference instances. The number of k instances will remain zero until the number of valid instances n is 12 or more.

The presence of actual interference during calibration can sabotage calibration for those sub-sites experiencing the strongest interference. The presence of receiver alarms or reference alarms or timing alarms on a given Base Radio will block the Base Radio from collecting new incidents for that channel.

3.2.2
Calibrating a Base Radio

In cases where a Base Radio was replaced, or the user initially used the calibration override capability and set to default but would like to calibrate now, the user will be given an option to return a site or sub-site or base radio to the un-calibrated state.

Prerequisites: Ensure the user account you want to use to access Interference Locator is assigned to the group with permissions to use the application.

Procedure:

1. In the Calibration view, select the Site in question.
2. For the channel in question click on the “info” link.
3. Select **Decalibrate Base Radio**
4. Select the subsite where the BR to de-calibrate is located.
5. Press the **Decalibrate Base Radio(s)** red button.

   The Base Radio and corresponding channel now goes from CALIBRATED or DEFAULT to UNCALIBRATED.
6. If the retiring Base Radio was previously calibrated select **Remove Calibration Data** under the “info” link.
7. Press **Clear Calibrate Data** red button.

Postrequisites: To calibrate the new radio, follow calibration procedures to inject calibration interference instances. There is no need generate instances to calibrate all radios.

3.2.3
Recalibrating a Whole Channel

Procedure:

1. In the Calibration view, select the Site in question.
2. For the channel in question click on the “info” link.
3. Select **Remove Calibration Data**.
4. Press **Clear Calibrate Data** red button.

   The whole channel now is uncalibrated and its calibration data is gone.

Postrequisites: To calibrate the whole channel again, follow calibration procedures to inject calibration interference instances to all base radios in the channel.

3.2.4
Overriding Interference Locator Calibration

Ensure the user account you want to use to access Interference Locator is assigned to the group with permissions to use the application.

Procedure:

1. In the Calibration view, select the Site in question.
2. Select the channel or channels to override calibration.
3. Click **Set Calibration to Default**.
4. The channel should now go from “UNCALIBRATED” to “DEFAULT”

   You need to refresh the screen.

3.3
Locator Operations

See Table 2: Incident Interpretation on page 22 for details on how to interpret the data presented in the map view of the Interference.

3.3.1
Viewing Interference Incidents Details

Prerequisites: Calibrate the Interference Locator application. See Calibrating Interference Locator on page 35.
Ensure the user account you want to use to access Interference Locator is assigned to the group with permissions to use the application.

Procedure:

Click on **Interference Incidents** tab.

3.3.1.1
Filtering Displayed Incidents

When and where to use:
Use the Incidents tab to display the locations of frequency interference on a map. The wizard provides the means to narrow the display to incidents occurring within a specified date range as well as on specific channels. Use the provided date-pickers to select the Start and End date ranges. Uncheck the channels for the incidents you would like removed from the display.

If the map is showing as grey, then map tiles need to be loaded via the Geographical Data Importer (GDI) as specified in the "Uploading Map Tile Files via GDI" section of *Unified Network Configurator* manual.

Procedure:

1. Click on **Interference Incidents** tab.
2. Enter the start and end dates for your search.

3.3.2
Exporting KML Files

This procedure explains how to export processed interference incidents to Keyhole Markup Language (KML) files.

Procedure:

1. In **Export** view, click **Export Incidents** button.
2. Save the .kml file in a preferred location.

3.3.3
Viewing KML Files

This procedure explains how to view the KML files in Google Earth application.

Prerequisites:
Download and install Google Earth application from the Google Earth website.

WARNING: Importing the generated file into Google Earth will give the company Google access to the information contained therein.

Procedure:

1. Launch Google Earth application.
2. Click **File** → **Open** and choose the file you wish to view.

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Chapter 4

Interference Locator Troubleshooting

This chapter provides any applicable scenarios for Troubleshooting the Interference Locator application.

When there is a high level of failure of the generated incidents for calibration for a specific channel and specific sub-site, it is possible that there are actual interferences that prevent the Base Radio from properly calibrating.

If the interference is strong enough to reach other sub-sites, place the Interference Locator under DEFAULT calibration and search for the interference.

If the interference is too weak to reach other sub-sites, verify the presence of an interference via Base Radio CSS RSSI measurements, and search manually for the interference around the failing sub-site.

The presence of receiver alarms or reference alarms or timing alarms on a given Base Radio will block the Base Radio from collecting new incident data for that channel. The user needs to resolve these Base Radio alarms before proceeding to calibrate or use the Interference Locator feature.

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Chapter 5

Interference Locator Disaster Recovery

This chapter provides the Disaster Recovery instructions for the Interference Locator application.

The raw incident data, calibration data, sub-site locations and the processed incident data shall be backed up and restored during the UNC servers backup and restore operations. See the *Unified Network Configurator* manual.

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