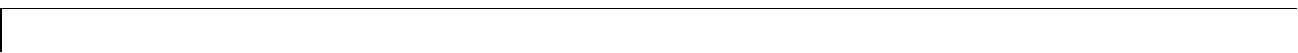# RF Toolbox Release Notes

These Release Notes describe the RF Blockset, Version 1.0.1. This release includes several bug fixes introduced since Version 1.0 (Release 14), but no new features.

The following topics are discussed in these notes:

- "Introduction to the RF Toolbox" on page 1-2
- "Platform Limitations" on page 1-6
- Important Version 1.0.1 bug fixes. If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site, and use the link provided.

Printing the Release Notes

If you would like to print the Release Notes, you can link to a PDF version.

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RF Toolbox 1.0.1 Release Notes

Introduction to the RF Toolbox

The RF Toolbox enables you to create and combine RF (Radio Frequency) circuits for simulation in the frequency domain with support for both nonlinear and noise data. You can read, write, analyze, combine, and visualize RF network parameters.

RF technology is used to design and test RF circuits for cable television, wireless LAN, and other wireless applications such as broadcasting, radar, satellite communications, microwave relay, and mobile telephony.

Work Directly with Network Parameter Data

You can work directly with your own network parameter data or with data from files. Functions enable you to:

- Read and write RF data in Touchstone® `.snp`, `.ynp`, `.znp`, and `.hnp` formats, as well as the MathWorks .AMP format.
- Convert among S, Y, Z, h, T, and ABCD network parameters
- Plot your data on X-Y plane and polar plane plots, as well as Smith® charts
- Calculate cascaded S-parameters and de-embed S-parameters from a cascaded network
- Calculate input and output reflection coefficients, and voltage standing-wave ratio (VSWR) at the reflection coefficient

Model RF Networks

You can also assemble RF networks from circuit objects that model:

- Passive networks and general circuit elements using Touchstone `.snp`, `.ynp`, `.znp`, and `.hnp` files.
- Amplifiers and mixers using data from Touchstone format `.s2p`, `.y2p`, `.z2p`, and `.h2p` files as well as the MathWorks format `.amp` files.
- Transmission lines based on their geometries.
- LC ladder filters based on their electrical interactions.

From these components and previously created network objects, you can create cascaded, hybrid, parallel, and series networks.

Functions associated with these objects enable you to:

- Analyze network parameters at specified frequencies
- Calculate needed parameters
- Plot network parameters in X-Y plane, polar plane, and Smith chart formats.
- Extract parameters from an object
- Perform a variety of utility functions such as copying an object and listing valid parameters for visualization.

You can move network data among Touchstone format files or MathWorks format `.amp` files, your workspace, and circuit or data objects – wherever you need it.

The RF Blockset, which accepts data generated by the RF Toolbox, provides time-domain simulation

Analyze Circuits Interactively

A graphical tool, RF Tool, enables you to design, analyze, and visualize RF components and networks interactively, then export the circuits to your workspace or to a file for use with RF Toolbox functions and other circuit objects.

Additional Topics

This rest of this introduction includes these topics:

- "RF Circuits" on page 1-3
- "Data Visualization" on page 1-4
- "Data Format Support" on page 1-4
- "RF Analysis GUI" on page 1-4
- "Required Products" on page 1-4
- "Demos" on page 1-5

RF Circuits

The RF Toolbox provides classes that enable you to model these circuit objects and networks.

- Passive networks
- Amplifiers and mixers

- Transmission lines: coaxial, coplanar waveguide, general transmission, microstrip, parallel-plate, and two-wire
- SeriesRLC and shuntRLC circuits
- LC ladder filters: LC bandpass pi, LC bandpass tee, LC bandstop pi, LC bandstop tee, LC highpass pi, LC highpass tee, LC lowpass pi, and LC lowpass tee
- Networks: cascade, hybrid, parallel, and series

You can also model general circuit elements from data files.

Data Visualization

The RF Toolbox enables you to plot the network parameters of the circuits you create.

You can generate an X-Y plane plot, polar plane plot, or Smith chart of one or more selected network parameters directly from your data. You can also generate these plots from circuit objects you create using the RF Toolbox. See the `rfckt` and `rfdata` reference pages for information.

Data Format Support

The RF Toolbox supports the Touchstone SnP, YnP, ZnP, and HnP data file formats. It also introduces the MathWorks AMP format for amplifier data. For more information about this format, see AMP File Format in the RF Toolbox documentation.

RF Analysis GUI

RF Tool is an RF analysis GUI that provides a visual interface for creating and analyzing RF (radio frequency) components and networks. You can create RF circuits quickly with the GUI. You can also import and export circuits from the MATLAB workspace and RF data files.

RF Tool also provides the ability to set circuit parameters, analyze circuits, view their resulting S-parameter data, and visualize the data using X-Y plane plots, polar plane plots, and Smith charts.

Required Products

The RF Toolbox requires MATLAB. It provides simulation in the frequency domain. The RF Blockset, which can accept data generated by the RF Toolbox, provides time-domain simulation.

Demos

Demos of the RF Toolbox capabilities are available on the Demos tab of the MATLAB Help browser. These demos show examples of

- RF data objects
- RF circuit objects
- De-embedding S-parameters
- Placing circles on a Smith chart
- Designing impedance matching networks

Platform Limitations

The RF Toolbox 1.0.1 features have the platform limitations described in this section.

RF Tool Available Only on UNIX and Windows

RF Tool, the RF analysis GUI is available only on supported UNIX and Windows platforms. It is not available on the Mac.