

# **SimRF™ Release Notes**

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*SimRF™ Release Notes*

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## Summary by Version

This table provides quick access to what's new in each version. For clarification, see “Using Release Notes” on page 1.

Version (Release)	New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
<b>Latest Version V3.2 (R2012a)</b>	Yes Details	No	Bug Reports Includes fixes
V3.1 (R2011b)	Yes Details	Yes Summary	Bug Reports Includes fixes
V3.0.2 (R2011a)	No	No	Bug Reports Includes fixes
V3.0.1 (R2010bSP1)	No	No	Bug Reports Includes fixes
V3.0 (R2010b)	Yes Details	Yes Summary	Bug Reports

### Using Release Notes

Use release notes when upgrading to a newer version to learn about:

- New features
- Changes
- Potential impact on your existing files and practices

Review the release notes for other MathWorks® products required for this product (for example, MATLAB® or Simulink®). Determine if enhancements, bugs, or compatibility considerations in other products impact you.

If you are upgrading from a software version other than the most recent one, review the current release notes and all interim versions. For example, when you upgrade from V1.0 to V1.2, review the release notes for V1.1 and V1.2.

## **What Is in the Release Notes**

### **New Features and Changes**

- New functionality
- Changes to existing functionality

### **Version Compatibility Considerations**

When a new feature or change introduces a reported incompatibility between versions, the **Compatibility Considerations** subsection explains the impact.

Compatibility issues reported after the product release appear under Bug Reports at the MathWorks Web site. Bug fixes can sometimes result in incompatibilities, so review the fixed bugs in Bug Reports for any compatibility impact.

### **Fixed Bugs and Known Problems**

MathWorks offers a user-searchable Bug Reports database so you can view Bug Reports. The development team updates this database at release time and as more information becomes available. Bug Reports include provisions for any known workarounds or file replacements. Information is available for bugs existing in or fixed in Release 14SP2 or later. Information is not available for all bugs in earlier releases.

Access Bug Reports using your MathWorks Account.

### **Documentation on the MathWorks Web Site**

Related documentation is available on [mathworks.com](http://mathworks.com) for the latest release and for previous releases:

- Latest product documentation
- Archived documentation

## Version 3.2 (R2012a) SimRF

This table summarizes what's new in V3.2 (R2012a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes	No	Bug Reports

New features and changes introduced in this version are:

- “New Transmission Line Block” on page 3
- “Expanded S-Parameter Modeling” on page 3

### New Transmission Line Block

The Transmission Line block is available in this version for modeling delay-based and lumped-element transmission lines.

### Expanded S-Parameter Modeling

A new frequency-domain-based S-parameter simulation feature is available in this version. You can specify frequency-domain S-parameter modeling for Amplifier and S-Parameters blocks. See the new demo, Comparing Time- and Frequency-Domain Simulation Options for S-parameters, to learn more about choosing between the two simulation options.

## Version 3.1 (R2011b) SimRF

This table summarizes what's new in V3.1 (R2011b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes	Yes	Bug Reports Includes fixes

New features and changes introduced in this version are:

- “New Real-Passband Output Support” on page 4
- “New Product Dependencies” on page 4
- “Enhanced Model Compilation” on page 5
- “Enhanced S-Parameter Visualization” on page 5
- “Enhanced Noise Modeling” on page 5
- “Conversion of Error and Warning Message Identifiers” on page 6

### New Real-Passband Output Support

The SimRF Output block now supports output of real-passband signals from the SimRF™ environment. See the “Reduce Computations by Using RF Simulation Techniques” example in the *Getting Started* documentation for a comparison SimRF and Simulink techniques for modeling real passband signals.

### New Product Dependencies

To run models with SimRF Equivalent Baseband library blocks, you no longer need to install DSP System Toolbox™ software. In this version, you must install DSP System Toolbox software only if you want to use:

- SimRF Idealized Baseband library blocks.
- DSP System Toolbox features, such as frames and DSP System Toolbox library blocks.



## Enhanced Model Compilation

To run models with S-Parameters blocks, SimRF software no longer generates support files. In this version, SimRF models require compilation only when they contain an Amplifier or Mixer block.

## Compatibility Considerations

Models from previous versions that contain Amplifier or Mixer do not run in this version unless you recompile them. To run this type of model in the new version, perform one of the following procedures.

- Copy your model, rename it, and run the renamed model in the new version. This action causes SimRF to generate new support files with different file names, leaving the original model and support files intact. This procedure guarantees that the original model continues to run in the old version.
- Run the model in the new version, and follow the instructions on the error message to delete the old support files. Next, run the model again to generate new support files. The recompiled model does not run in previous versions.

## Enhanced S-Parameter Visualization

The S-Parameters block now displays rational fitting results alongside data in the Visualization pane. You can use this feature to validate simulation of S-parameter data in SimRF software.

## Enhanced Noise Modeling

- The SimRF Parameters block now supports noise temperature modeling from a single parameter. Set the **Temperature** parameter to model a global noise temperature for each Amplifier and Mixer block in the SimRF environment.
- The Noise block now supports noise modeling on a subset of carrier frequencies. Set the **Carrier frequencies** parameter to a vector of frequencies to model noise on only those carriers.

## Conversion of Error and Warning Message Identifiers

For R2011b, error and warning messages identifiers have changed in SimRF software.

### Compatibility Considerations

If you have scripts or functions that use message identifiers that changed, you must update the code to use the new identifiers. Typically, message identifiers are used to turn off specific warning messages.

For example, the `SimRF:InvalidString` identifier has changed to `simrf:simrf_restring:InvalidString`. If your code checks for `SimRF:InvalidString`, you must update it to check for `simrf:simrf_restring:InvalidString` instead.

To determine the identifier for a warning, run the following command just after you see the warning:

```
[MSG,MSGID] = lastwarn;
```

This command saves the message identifier to the variable `MSGID`.

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**Note** Warning messages indicate a potential issue with your code. While you can turn off a warning, a suggested alternative is to change your code so it runs warning-free.

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## Version 3.0.2 (R2011a) SimRF

This table summarizes what's new in V3.0.2 (R2011a):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>
No	No	Bug Reports Includes fixes

## Version 3.0.1 (R2010bSP1) SimRF

This table summarizes what's new in V3.0.1 (R2010bSP1):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>
No	No	Bug Reports Includes fixes

## Version 3.0 (R2010b) SimRF

This table summarizes what's new in V3.0 (R2010b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	Yes—Details labeled as <b>Compatibility Considerations</b> , below. See also Summary.	Bug Reports

New features and changes introduced in this version are:

- “New Circuit Envelope Library” on page 9
- “New Circuit-Envelope Simulation Environment” on page 10
- “New RF System Demos” on page 11

### New Circuit Envelope Library

SimRF 3.0 software introduces Circuit Envelope Elements, Sources, and Utilities libraries, which contain:

- Capacitor, Inductor, Resistor, and Impedance blocks that can connect in any configuration.
- A 2-port Amplifier block and a 3-port Mixer block, which support second-order and third-order nonlinearity modeling.
- An S-Parameters block for modeling black-box elements with up to four ports.
- Continuous Wave, Sinusoid, and Noise current and voltage sources that can model signals at multiple carrier frequencies simultaneously.
- A SimRF Outport block for probing signals from any location in an RF network.

For a full list of SimRF Circuit Envelope library blocks, see the *SimRF Reference* documentation.

## New Circuit-Envelope Simulation Environment

SimRF 3.0 software introduces circuit-envelope simulation of RF systems into the Simulink environment. SimRF circuit-envelope simulation technology is built on the Simscape™ platform. All blocks in the SimRF Circuit Envelope library support the features available in the SimRF environment. For an introduction to circuit-envelope simulation, see the *SimRF Getting Started Guide*.

### Compatibility Considerations

SimRF circuit-envelope simulation software diverges from the baseband-equivalent simulation technology of RF Blockset™ version 2.5.1 and earlier. In SimRF version 3.0, RF Blockset software is part of SimRF software. RF Blockset Mathematical and Physical libraries have been renamed SimRF Equivalent Baseband and Idealized Baseband libraries.

- SimRF Circuit Envelope library blocks have different product dependencies than Equivalent Baseband and Idealized Baseband library blocks. To run models with Equivalent Baseband or Idealized Baseband library blocks, you must install DSP System Toolbox software. See Working with SimRF Software for more information on SimRF product dependencies.
- SimRF Equivalent Baseband library and Idealized Baseband library blocks do not support features of the SimRF environment, such as multi-carrier simulation, signal probing, or general network topologies.
- Blocks in the SimRF Circuit Envelope library do not connect to blocks in the Equivalent Baseband library or Idealized Baseband library. To pass data between these blocks, convert signals from SimRF Circuit Envelope and Equivalent Baseband library blocks to Simulink signals using:
  - Circuit Envelope library SimRF Inport and SimRF Outport blocks.
  - Equivalent Baseband library Input Port and Output Port blocks.
- If you have Signal Processing Blockset™ installed, models built in RF Blockset version 2.5.1 run in SimRF version 3.0.
- RF Blockset version 2.5.1 documentation is contained within the SimRF documentation.

## **New RF System Demos**

SimRF version 3.0 introduces eight new demos:

- AC Analysis of an RF System
- Architectural Design of a Low-IF Receiver System
- Executable Specification of a Direct Conversion Receiver
- Frequency Response of an RF Transmit/Receive Duplex Filter
- Impact of an RF Receiver on Communication System Performance
- Measuring Image Rejection Ratio in Receivers
- Two-Tone Envelope Analysis Using Real Signals
- Validating IP2/IP3 Using Complex Signals

## Compatibility Summary for SimRF

This table summarizes new features and changes that might cause incompatibilities when you upgrade from an earlier version, or when you use files on multiple versions. Details are provided in the description of the new feature or change.

<b>Version (Release)</b>	<b>New Features and Changes with Version Compatibility Impact</b>
<b>Latest Version V3.2 (R2012a)</b>	None
V3.1 (R2011b)	See the <b>Compatibility Considerations</b> subheading
V3.0.2 (R2011a)	None
V3.0.1 (R2010bSP1)	None
V3.0 (R2010b)	See the <b>Compatibility Considerations</b> subheading for each of these new features or changes: <ul style="list-style-type: none"><li>• New Circuit Envelope Simulation Environment</li></ul>