

R&S® AFQ-K352, R&S® SMBV-K352,  
R&S® SMJ-K352, R&S® SMU-K352  
HD Radio™ Test Waveforms  
Manual



1171.6450.32 – 06

This document describes the following software options:

- R&S®AFQ-K352  
1401.6154.02
- R&S®SMBV-K352  
1415.8431.02
- R&S®SMJ-K352  
1409.2958.02
- R&S®SMU-K352  
1408.8069.02

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The following abbreviations are used throughout this manual: R&S®SMBV100A is abbreviated as R&S SMBV, R&S®SMJ100A is abbreviated as R&S SMJ, R&S®SMU200A is abbreviated as R&S SMU, R&S®AFQ100A is abbreviated as R&S AFQ

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# 1 Preface

## 1.1 Documentation Overview

The user documentation for the R&S SMx/AFQ consists of the following parts:

- Online Help system on the instrument,
- "Quick Start Guide" printed manual,
- Documentation CD-ROM with:
  - Online help system (\*.chm) as a standalone help,
  - Operating Manuals for base unit and options,
  - Service Manual,
  - Data sheet and specifications,
  - Links to useful sites on the R&S internet.

### Online Help

The Online Help is embedded in the instrument's firmware. It offers quick, context-sensitive access to the complete information needed for operation and programming. The online help contains help on operating the R&S SMx/AFQ and all available options.

### Quick Start Guide

The Quick Start Guide is delivered with the instrument in printed form and in PDF format on the Documentation CD-ROM. It provides the information needed to set up and start working with the instrument. Basic operations and an example of setup are described. The manual includes also general information, e.g., Safety Instructions.

### Operating Manuals

The Operating Manuals are a supplement to the Quick Start Guide. Operating Manuals are provided for the base unit and each additional (software) option.

These manuals are available in PDF format - in printable form - on the Documentation CD-ROM delivered with the instrument. In the Operating Manual for the base unit, all instrument functions are described in detail. Furthermore, it provides an introduction to remote control and a complete description of the remote control commands with programming examples. Information on maintenance, instrument interfaces and error messages is also given.

In the individual option manuals, the specific functions of the option are described in detail. For additional information on default settings and parameters, refer to the data sheets. Basic information on operating the R&S SMx/AFQ is not included in the option manuals.

### Service Manual

The Service Manual is available in PDF format - in printable form - on the Documentation CD-ROM delivered with the instrument. It describes how to check compliance with

rated specifications, on instrument function, repair, troubleshooting and fault elimination. It contains all information required for repairing the instrument by the replacement of modules.

This manual can also be ordered in printed form (see ordering information in the data sheet).

### Release Notes

The release notes describe new and modified functions, eliminated problems, and last minute changes to the documentation. The corresponding firmware version is indicated on the title page of the release notes. The current release notes are provided in the Internet.

### Web Help

The web help provides online access to the complete information on operating the R&S SMx/AFQ and all available options, without downloading. The content of the web help corresponds to the user manuals for the latest product version.

The web help is available on the R&S SMx/AFQ product page at the Downloads > Web Help area.

## 1.2 Typographical Conventions

The following text markers are used throughout this documentation:

Convention	Description
"Graphical user interface elements"	All names of graphical user interface elements on the screen, such as dialog boxes, menus, options, buttons, and softkeys are enclosed by quotation marks.
KEYS	Key names are written in capital letters.
File names, commands, program code	File names, commands, coding samples and screen output are distinguished by their font.
<i>Input</i>	Input to be entered by the user is displayed in italics.
<a href="#">Links</a>	Links that you can click are displayed in blue font.
"References"	References to other parts of the documentation are enclosed by quotation marks.

## 2 Getting Started

The HD Radio™ test waveforms files (\*.wv) are provided on a DVD set and can be played on the Arbitrary Waveform Generator (ARB) of the instruments listed under [chapter 2.3, "System Requirements"](#), on page 16.



Playing of HD Radio test waveforms on an R&S Signal Generator and R&S I/Q Modulation Generator requires a license form iBiquity Digital Corporation.

### 2.1 Contents of the Disk

Waveform files (\*.wv) as listed in [chapter 3, "Available Waveform Files"](#), on page 22.

### 2.2 Version History



For information on the current firmware version refer to the release notes of the instrument.

#### 2.2.1 Version 1.40

##### 119 new waveform files

CC\_FMr440\_e1wfr015\_HighDataRate.wv  
CC\_FMr440d\_e1wfr011.wv  
CC\_FMr440d\_e1wfr012.wv  
CC\_FMr440d\_e1wfr013.wv  
CC\_FMr440d\_e1wfr014.wv  
CC\_TTN\_FMr440a\_e1wfr001.wv  
CC\_TTN\_FMr440a\_e1wfr002.wv  
CC\_TTN\_FMr440a\_e1wfr003.wv  
CC\_TTN\_FMr440a\_e1wfr004.wv  
CC\_TTN\_FMr440a\_e1wfr005.wv  
CC\_TTN\_FMr440a\_e1wfr006.wv  
CC\_TTN\_FMr440a\_e1wfr007.wv

CC\_TTN\_FMr440a\_e1wfr008.wv  
CC\_TTN\_FMr440a\_e1wfr009.wv  
CC\_TTN\_FMr440a\_e1wfr010.wv  
CC\_TTN\_FMr440a\_e1wfr011.wv  
CC\_TTN\_FMr440a\_e1wfr012.wv  
CC\_TTN\_FMr440a\_e1wfr013.wv  
CC\_TTN\_FMr440a\_e1wfr014.wv  
CC\_TTN\_FMr440a\_e1wfr015.wv  
CC\_TTN\_FMr440a\_e1wfr016.wv  
CC\_TTN\_FMr440a\_e1wfr017.wv  
CC\_TTN\_FMr440a\_e1wfr018.wv  
CC\_TTN\_FMr440a\_e1wfr019.wv  
CC\_TTN\_FMr440a\_e1wfr019b.wv  
CC\_TTN\_FMr440a\_e1wfr020.wv  
CC\_TTN\_FMr440a\_e1wfr020b.wv  
CC\_TTN\_FMr440a\_e1wfr021.wv  
CC\_TTN\_FMr440a\_e1wfr022.wv  
CC\_TTN\_FMr440a\_e1wfr023.wv  
CC\_TTN\_FMr440a\_e1wfr024.wv  
CC\_TTN\_FMr440a\_e1wfr025.wv  
CC\_TTN\_FMr440a\_e1wfr026.wv  
CC\_TTN\_FMr440a\_e1wfr027.wv  
CC\_TTN\_FMr440a\_e1wfr028.wv  
CC\_TTN\_FMr440a\_e1wfr029.wv  
CC\_TTN\_FMr440a\_e1wfr030.wv  
CC\_TTN\_FMr440a\_e1wfr031.wv  
CC\_TTN\_FMr440a\_e1wfr032.wv  
CC\_TTN\_FMr440a\_e1wfr033.wv  
CC\_TTN\_FMr440a\_e1wfr034.wv  
CC\_TTN\_FMr440a\_e1wfr035.wv  
CC\_TTN\_FMr440a\_e1wfr036.wv  
CC\_TTN\_FMr440a\_e1wfr037.wv  
CC\_TTN\_FMr440a\_e1wfr038.wv

CC\_TTN\_FMr440a\_e1wfr039.wv  
CC\_TTN\_FMr440a\_e1wfr040.wv  
CC\_TTN\_FMr440a\_e1wfr041.wv  
CC\_TTN\_FMr440a\_e1wfr042.wv  
CC\_TTN\_FMr440a\_e1wfr043.wv  
CC\_TTN\_FMr440a\_e1wfr044.wv  
CC\_TTN\_FMr440a\_e1wfr045.wv  
CC\_TTN\_FMr440a\_e1wfr046.wv  
CC\_TTN\_FMr440a\_e1wfr047.wv  
CC\_TTN\_FMr440a\_e1wfr048.wv  
CC\_TTN\_FMr440a\_e1wfr049.wv  
CC\_TTN\_FMr440a\_e1wfr049b.wv  
CC\_TTN\_FMr440a\_e1wfr050.wv  
CC\_TTN\_FMr440a\_e1wfr050b.wv  
CC\_TTN\_FMr440a\_e1wfr051.wv  
CC\_TTN\_FMr440a\_e1wfr051b.wv  
CC\_TTN\_FMr440a\_e1wfr052.wv  
CC\_TTN\_FMr440a\_e1wfr053.wv  
CC\_TTN\_FMr440a\_e1wfr054.wv  
CC\_TTN\_FMr440a\_e1wfr055.wv  
CC\_TTN\_FMr440a\_e1wfr056.wv  
CC\_TTN\_FMr440a\_e1wfr057.wv  
CC\_TTN\_FMr440a\_e1wfr058.wv  
CC\_TTN\_FMr440a\_e1wfr065.wv  
CC\_TTN\_FMr440a\_e1wfr070.wv  
CC\_TTN\_FMr440a\_e1wfr071.wv  
CC\_TTN\_FMr440a\_e1wfr072.wv  
IB\_AMr201\_e1awfr1190.wv  
IB\_AMr208\_e1awfr1221.wv  
IB\_AMr208\_e1awfr1249.wv  
IB\_AMr208\_e1awfr1260.wv  
IB\_AMr208b\_e1awf1123.wv  
IB\_AMr208c\_e1awf1124.wv

IB\_AMr230\_e1awfr1187.wv  
IB\_AMr230\_e1awfr1261.wv  
IB\_AMr430\_e1wfr1028.wv  
IB\_AMr440\_e1wfr1116.wv  
IB\_AMr440\_e1wfr1117.wv  
IB\_FMr201\_e1wfr1189.wv  
IB\_FMr208\_e1wfr1122.wv  
IB\_FMr208\_e1wfr1185.wv  
IB\_FMr208\_e1wfr1246.wv  
IB\_FMr208\_e1wfr1247.wv  
IB\_FMr208\_e1wfr1248.wv  
IB\_FMr208c\_e1wfc546.wv  
IB\_FMr220\_e1wfa108.wv  
IB\_FMr220b\_e1wfr1119.wv  
IB\_FMr220c\_e1wfr1191.wv  
IB\_FMr430\_e1wfr1090.wv  
IB\_FMr430\_e1wfr1091.wv  
IB\_FMr430\_e1wfr1092.wv  
IB\_FMr430\_e1wfr1093.wv  
IB\_FMr430\_e1wfr1094.wv  
IB\_FMr430\_e1wfr1095.wv  
IB\_FMr430\_e1wfr1096.wv  
IB\_FMr430\_e1wfr1097.wv  
IB\_FMr430\_e1wfr1098.wv  
IB\_FMr430\_e1wfr1099.wv  
IB\_FMr430\_e1wfr1100.wv  
IB\_FMr430\_e1wfr1101.wv  
IB\_FMr430\_e1wfr1102.wv  
IB\_FMr430\_e1wfr1152.wv  
IB\_FMr430a\_e1wfr1085.wv  
IB\_FMr440\_e1wfr1111.wv  
IB\_FMr440\_e1wfr1112.wv  
IB\_FMr440\_e1wfr1113.wv

IB\_FMr440\_e1wfr1114.wv

IB\_FMr440\_e1wfr1115.wv

IB\_FMr440\_e1wfr1243.wv

IB\_FMr440\_e1wfr1251.wv

IB\_FMr440\_e1wfr1252.wv

IB\_FMr440\_e1wfr1253.wv

IB\_FMr440\_e1wfr1254.wv

IB\_FMr440\_e1wfr1255.wv

#### **2 removed waveform files**

IB\_FMr208c\_e10wfc546

IB\_FMr208k\_e1wfa104

### **2.2.2 Version 1.30**

#### **29 new waveform files**

IB\_AMr001\_e1\_cw\_0\_m10.wv

IB\_AMr001\_e1\_cw\_2\_6.wv

IB\_AMr001\_e1\_cw\_m1\_m2.wv

IB\_AMr001\_e1\_cw\_m30\_0\_30.wv

IB\_AMr001\_e1\_cw\_m7p5\_10.wv

IB\_AMr430\_e1wfr1016.wv

IB\_AMr430\_e1wfr1017.wv

IB\_AMr430\_e1wfr1018.wv

IB\_AMr430\_e1wfr1019.wv

IB\_AMr430\_e1wfr1020.wv

IB\_AMr430\_e1wfr1021.wv

IB\_AMr430\_e1wfr1022.wv

IB\_AMr430\_e1wfr1023.wv

IB\_AMr430\_e1wfr1024.wv

IB\_AMr430\_e1wfr1025.wv

IB\_AMr430\_e1wfr1026.wv

IB\_AMr430\_e1wfr1027.wv

IB\_FMr001\_e1\_cw\_0\_100.wv

IB\_FMr001\_e1\_cw\_0\_m100.wv  
 IB\_FMr001\_e1\_cw\_m275\_0\_275.wv  
 IB\_FMr001\_e1\_cw\_m50\_0.wv  
 IB\_FMr230a\_e1wfa153.wv  
 IB\_FMr430\_e1wfr1080.wv  
 IB\_FMr430\_e1wfr1082.wv  
 IB\_FMr430\_e1wfr1083.wv  
 IB\_FMr430\_e1wfr1086.wv  
 IB\_FMr430\_e1wfr1087.wv  
 IB\_FMr430\_e1wfr1088.wv  
 IB\_FMr430\_e1wfr1089.wv

#### 4 removed waveform files

IB\_AMr208\_e0wfc33.wv  
 IB\_AMr208\_e0wfc34.wv  
 IB\_FMr208j\_e0wfa12.wv  
 IB\_FMr420c\_e1wfr1080.wv

#### 66 updated waveform files

Old file name	Name of replacement
IB_AM_e0_CW_dc.wv	IB_AM_e1a_CW_dc.wv
IB_AMr201_e0wfc52.wv	IB_AMr201_e1awfc52.wv
IB_AMr208_e0wfa05.wv	IB_AMr208_e1awfa05.wv
IB_AMr208_e0wfa07.wv	IB_AMr208_e1awfa07.wv
IB_AMr208_e0wfa10.wv	IB_AMr208_e1awfa10.wv
IB_AMr208_e0wfb01.wv	IB_AMr208_e1awfb01.wv
IB_AMr208_e0wfb02.wv	IB_AMr208_e1awfb02.wv
IB_AMr208_e0wfb03.wv	IB_AMr208_e1awfb03.wv
IB_AMr208_e0wfb04.wv	IB_AMr208_e1awfb04.wv
IB_AMr208_e0wfb05.wv	IB_AMr208_e1awfb05.wv
IB_AMr208_e0wfb102.wv	IB_AMr208_e1awfb102.wv
IB_AMr208_e0wfb104.wv	IB_AMr208_e1awfb104.wv
IB_AMr208_e0wfb111.wv	IB_AMr208_e1awfb111.wv
IB_AMr208_e0wfb113.wv	IB_AMr208_e1awfb113.wv
IB_AMr208_e0wfb119.wv	IB_AMr208_e1awfb119.wv

Old file name	Name of replacement
IB_AMr208_e0wfb121.wv	IB_AMr208_e1awfb121.wv
IB_AMr208_e0wfb124.wv	IB_AMr208_e1awfb124.wv
IB_AMr208_e0wfb126.wv	IB_AMr208_e1awfb126.wv
IB_AMr208_e0wfb128.wv	IB_AMr208_e1awfb128.wv
IB_AMr208_e0wfb130.wv	IB_AMr208_e1awfb130.wv
IB_AMr208_e0wfb131.wv	IB_AMr208_e1awfb131.wv
IB_AMr208_e0wfb132.wv	IB_AMr208_e1awfb132.wv
IB_AMr208_e0wfb134.wv	IB_AMr208_e1awfb134.wv
IB_AMr208_e0wfb135.wv	IB_AMr208_e1awfb135.wv
IB_AMr208_e0wfb145.wv	IB_AMr208_e1awfb145.wv
IB_AMr208_e0wfb243.wv	IB_AMr208_e1awfb243.wv
IB_AMr208_e0wfc00.wv	IB_AMr208_e1awfc00.wv
IB_AMr208_e0wfc04.wv	IB_AMr208_e1awfc04.wv
IB_AMr208_e0wfc06.wv	IB_AMr208_e1awfc06.wv
IB_AMr208_e0wfc08.wv	IB_AMr208_e1awfc08.wv
IB_AMr208_e0wfc10.wv	IB_AMr208_e1awfc10.wv
IB_AMr208_e0wfc11.wv	IB_AMr208_e1awfc11.wv
IB_AMr208_e0wfc19.wv	IB_AMr208_e1awfc19.wv
IB_AMr208_e0wfc20.wv	IB_AMr208_e1awfc20.wv
IB_AMr208_e0wfc23.wv	IB_AMr208_e1awfc23.wv
IB_AMr208_e0wfc24.wv	IB_AMr208_e1awfc24.wv
IB_AMr208_e0wfc26.wv	IB_AMr208_e1awfc26.wv
IB_AMr208_e0wfc27.wv	IB_AMr208_e1awfc27.wv
IB_AMr208_e0wfc29.wv	IB_AMr208_e1awfc29.wv
IB_AMr208_e0wfc30.wv	IB_AMr208_e1awfc30.wv
IB_AMr208_e0wfc31.wv	IB_AMr208_e1awfc31.wv
IB_AMr208_e0wfc32.wv	IB_AMr208_e1awfc32.wv
IB_AMr208a_e0wfb00.wv	IB_AMr208a_e1awfb00.wv
IB_AMr208a_e0wfb138.wv	IB_AMr208a_e1awfb138.wv
IB_AMr208a_e0wfc33.wv	IB_AMr208a_e1awfc33.wv
IB_AMr208a_e0wfc34.wv	IB_AMr208a_e1awfc34.wv
IB_AMr208c_e0wfa11.wv	IB_AMr208c_e1awfa11.wv
IB_AMr220_e0wfc28.wv	IB_AMr220_e1awfc28.wv

Old file name	Name of replacement
IB_AMr230_e0wfr1005.wv	IB_AMr230_e1awfr1005.wv
IB_AMr230a_e0wfr1001.wv	IB_AMr230a_e1awfr1001.wv
IB_AMr230a_e0wfr1002.wv	IB_AMr230a_e1awfr1002.wv
IB_AMr230b_e0wfc102.wv	IB_AMr230b_e1awfc102.wv
IB_AMr230d_e0wfr12.wv	IB_AMr230d_e1awfr12.wv
IB_FMr230a_e0wfr1002.wv	IB_FMr230a_e1wfr1003.wv
IB_FMr230a_e0wfr1003.wv	IB_FMr230a_e1wfr1004.wv
IB_FMr230a_e0wfr1004.wv	IB_FMr230a_e1wfr1005.wv
IB_FMr230a_e0wfr1005.wv	IB_FMr230a_e1wfr1006.wv
IB_FMr230a_e0wfr1006.wv	IB_FMr230a_e1wfr1007.wv
IB_FMr230a_e0wfr1007.wv	IB_FMr230a_e1wfr1008.wv
IB_FMr230a_e0wfr1008.wv	IB_FMr230a_e1wfr1009.wv
IB_FMr230a_e0wfr1009.wv	IB_FMr230a_e1wfr1011.wv
IB_FMr230a_e0wfr1011.wv	IB_FMr230a_e1wfr1012.wv
IB_FMr230a_e0wfr1012.wv	IB_FMr230a_e1wfr1013.wv
IB_FMr230a_e0wfr1013.wv	IB_FMr230a_e1wfr1037.wv
IB_FMr230a_e0wfr1037.wv	IB_FMr230b_e1wfr1002.wv
IB_FMr430_e1wfr1081.wv	IB_FMr430a_e1wfr1081.wv

### 2.2.3 Version 1.20

#### 25 new waveform files

IB\_AMr208\_e0wfc20.wv

IB\_AMr230\_e0wfr1005.wv

IB\_FMr001\_e1\_cw\_0\_m200.wv

IB\_FMr001\_e1\_cw\_10\_20.wv

IB\_FMr001\_e1\_cw\_50\_100.wv

IB\_FMr001\_e1\_cw\_m80\_m90.wv

IB\_FMr208c\_e0wfc210.wv

IB\_FMr208c\_e0wfc90.wv

IB\_FMr230\_e0wfc14.wv

IB\_FMr230\_e0wfr1061.wv

IB\_FMr230a\_e0wfr1037.wv

IB\_FMr230b\_e0wfr1024.wv  
 IB\_FMr230c\_e0wfd204.wv  
 IB\_FMr230c\_e0wfr1022.wv  
 IB\_FMr230c\_e0wfr1032.wv  
 IB\_FMr230d\_e0wfa78.wv  
 IB\_FMr230f\_e0wfr1023.wv  
 IB\_FMr420c\_e1wfr1080.wv  
 IB\_FMr430\_e1wfr1070.wv  
 IB\_FMr430\_e1wfr1071.wv  
 IB\_FMr430\_e1wfr1072.wv  
 IB\_FMr430\_e1wfr1073.wv  
 IB\_FMr430\_e1wfr1074.wv  
 IB\_FMr430\_e1wfr1075.wv  
 IB\_FMr430\_e1wfr1081.wv

#### 11 updated waveform files

Old file name	Name of replacement
IB_AMr208_e0wfb01.wv	IB_AMr208_e0wfc20.wv
IB_AMr230a_e0wfr1001.wv	IB_AMr230_e0wfr1001.wv
IB_AMr230a_e0wfr1002.wv	IB_AMr230_e0wfr1002.wv
IB_AMr230b_e0wfc102.wv	IB_AMr230a_e0wfc102.wv
IB_AMr230d_e0wfr12.wv	IB_AMr208a_e0wfa12.wv
IB_FMr208d_e0wfa141.wv	IB_FMr208c_e0wfa141.wv
IB_FMr208j_e0wfa12.wv	IB_FMr220a_e0wfa12.wv
IB_FMr230_e0wfr143.wv	IB_FMr208d_e0wfa143.wv
IB_FMr230a_e0wfc102.wv	IB_FMr230_e0wfc102.wv
IB_FMr230b_e0wfr1010.wv	IB_FMr230a_e0wfr1010.wv
IB_FMr230d_e0wfr1025.wv	IB_FMr230c_e0wfr1025.wv

### 2.2.4 Version 1.00

Initial release.

## 2.3 System Requirements

The waveforms files can be played on the instruments listed below. The instrument must be equipped with the options listed in the [table 2-1](#).

- R&S SMU200A Vector Signal Generator



- R&S SMBV100A Vector Signal Generator



- R&S SMJ100A Vector Signal Generator



**Table 2-1: Required options**

Option name	Description
<ul style="list-style-type: none"> <li>• R&amp;S SMU/SMJ-B9/B10</li> <li>• R&amp;S SMBV-B10/51 and -K511</li> </ul>	<ul style="list-style-type: none"> <li>• Baseband Generator</li> <li>• Baseband Generator with Memory Extension</li> </ul>
R&S SMx/AFQ-K352	HD Radio™ test waveforms

x = U for R&S SMU, J for R&S SMJ, BV for R&S SMBV

For information on the order number of an option refer to the data sheet.

## 2.4 Installation Instructions



The files are encrypted for reasons of protection. Copying or recording the waveforms files with the intention of using them on another playback device is prohibited!

If the waveforms files are supplied together with a new instrument, the waveforms files and the license key are already installed.

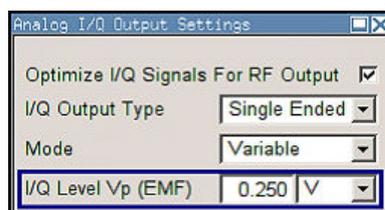
To install the HD Radio™ waveforms files on your instrument, proceed as described below.

1. Copy the waveforms files from the DVDs to USB stick, external USB HDD, or use the DVD with an external USB DVD drive.
2. Connect the USB stick, USB HDD or the external USB DVD drive to USB connector of the instrument.
3. Copy the waveforms files to the instrument target directory.
4. Enable the HD Radio™ option to play the encrypted files.  
At your instrument, select "Setup > Install SW Options > Option Key" and enter the key code.

## 2.5 Enabling the R&S SMBV to play the HD Radio™ waveforms files

To play the HD Radio™ waveforms files on your instrument, proceed as described below.

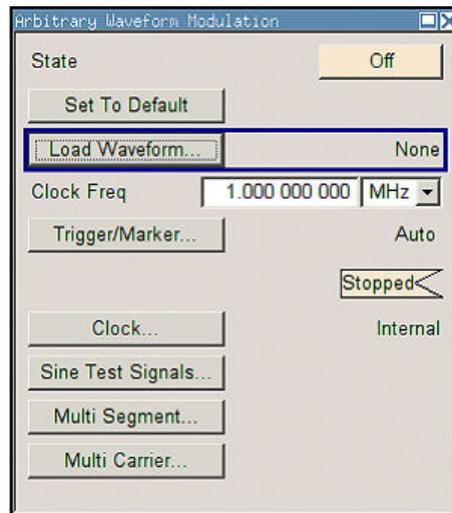
1. Press the PRESET key.  
SCPI command: `*RST`  
  
The instrument's settings will be adjust to a standard set of operating conditions.
2. Select "AWGN/IMP > Analog I/Q Out Settings" and set the parameter "I/Q Level Vp (EMF)" to 0.25 V to meet the RF requirements for this option.



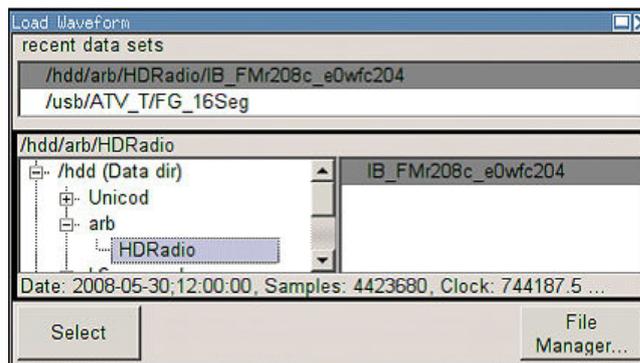
SCPI command: `SOUR:IQ:OUTP:LEV 0.25`

3. Select "Baseband block > ARB".

Enabling the R&S SMBV to play the HD Radio™ waveforms files



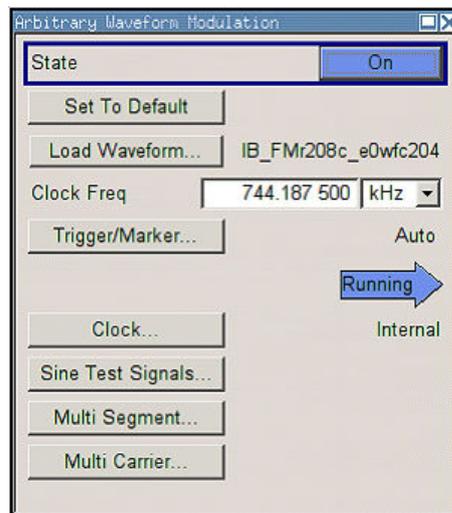
4. Select "Load Waveform" button, navigate to the directory with the HD Radio™ waveforms files (for instance "/hdd/ARB/HDRadio") and select a file from the list. Only files with extension \*.wv are displayed.



SCPI command: SOUR:BB:ARB:WAV:SEL  
'hdd/ARB/HDRadio/IB\_FMr208c\_e0wfc204.wv'

The name of the selected file and the clock frequency are displayed in the "ARB" dialog.

Enabling the R&S SMU/SMJ to play the HD Radio™ waveforms files



5. Set the "State" to ON to enable ARB modulation.

SCPI command: `SOUR:BB:ARB:STAT ON`

The R&S SMBV process the selected waveform file.

## 2.6 Enabling the R&S SMU/SMJ to play the HD Radio™ waveforms files

To play the HD Radio™ waveforms files on your instrument, proceed as described below.

1. Press the PRESET key.

SCPI command: `*RST`

The instrument's settings will be adjust to a standard set of operating conditions.

2. Select "Baseband block > ARB".

Enabling the R&S SMU/SMJ to play the HD Radio™ waveforms files



3. Select "Load Waveform" button, navigate to the directory with the HD Radio™ waveforms files (for instance "d:/ARB/HDRadio") and select a file from the list. Only files with extension \*.wv are displayed.

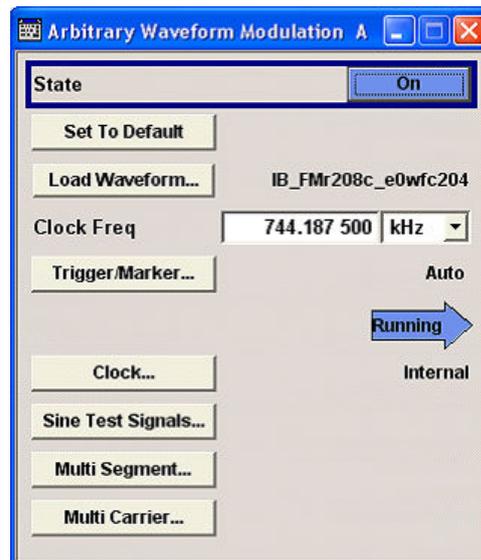


SCPI command:

```
SOUR:BB:ARB:WAV:SEL 'd:/ARB/HDRadio/IB_FMr208c_e0wfc204.wv'
```

The name of the selected file and the clock frequency are displayed in the "ARB" dialog.

Enabling the R&S SMU/SMJ to play the HD Radio™ waveforms files



4. Set the "State" to ON to enable ARB modulation.

SCPI command: `SOUR:BB:ARB:STAT ON`

The R&S Signal Generator process the selected waveform file.

## 3 Available Waveform Files

The disk contains 3 folders with the available waveform files. For details on the waveform files contact the iBiquity Digital Corporation.

### 3.1 AM Folder

Contains the following waveform files, listed in alphabetical order:

IB\_AM\_e1\_awgn.wv  
IB\_AM\_e1a\_CW\_dc.wv  
IB\_AMr001\_e1\_cw\_0\_m10.wv  
IB\_AMr001\_e1\_cw\_2\_6.wv  
IB\_AMr001\_e1\_cw\_m1\_m2.wv  
IB\_AMr001\_e1\_cw\_m30\_0\_30.wv  
IB\_AMr001\_e1\_cw\_m7p5\_10.wv  
IB\_AMr201\_e1awfc52.wv  
IB\_AMr201\_e1awfr1190.wv  
IB\_AMr208\_e1awfa05.wv  
IB\_AMr208\_e1awfa07.wv  
IB\_AMr208\_e1awfa10.wv  
IB\_AMr208\_e1awfb01.wv  
IB\_AMr208\_e1awfb02.wv  
IB\_AMr208\_e1awfb03.wv  
IB\_AMr208\_e1awfb04.wv  
IB\_AMr208\_e1awfb05.wv  
IB\_AMr208\_e1awfb102.wv  
IB\_AMr208\_e1awfb104.wv  
IB\_AMr208\_e1awfb111.wv  
IB\_AMr208\_e1awfb113.wv  
IB\_AMr208\_e1awfb119.wv  
IB\_AMr208\_e1awfb121.wv  
IB\_AMr208\_e1awfb124.wv  
IB\_AMr208\_e1awfb126.wv  
IB\_AMr208\_e1awfb128.wv

IB\_AMr208\_e1awfb130.wv  
IB\_AMr208\_e1awfb131.wv  
IB\_AMr208\_e1awfb132.wv  
IB\_AMr208\_e1awfb134.wv  
IB\_AMr208\_e1awfb135.wv  
IB\_AMr208\_e1awfb145.wv  
IB\_AMr208\_e1awfb243.wv  
IB\_AMr208\_e1awfc00.wv  
IB\_AMr208\_e1awfc04.wv  
IB\_AMr208\_e1awfc06.wv  
IB\_AMr208\_e1awfc08.wv  
IB\_AMr208\_e1awfc10.wv  
IB\_AMr208\_e1awfc11.wv  
IB\_AMr208\_e1awfc19.wv  
IB\_AMr208\_e1awfc20.wv  
IB\_AMr208\_e1awfc23.wv  
IB\_AMr208\_e1awfc24.wv  
IB\_AMr208\_e1awfc26.wv  
IB\_AMr208\_e1awfc27.wv  
IB\_AMr208\_e1awfc29.wv  
IB\_AMr208\_e1awfc30.wv  
IB\_AMr208\_e1awfc31.wv  
IB\_AMr208\_e1awfc32.wv  
IB\_AMr208\_e1awfr1221.wv  
IB\_AMr208\_e1awfr1249.wv  
IB\_AMr208\_e1awfr1260.wv  
IB\_AMr208a\_e1awfb00.wv  
IB\_AMr208a\_e1awfb138.wv  
IB\_AMr208a\_e1awfc33.wv  
IB\_AMr208a\_e1awfc34.wv  
IB\_AMr208b\_e1awf1123.wv  
IB\_AMr208c\_e1awf1124.wv  
IB\_AMr208c\_e1awfa11.wv

IB\_AMr220\_e1awfc28.wv  
IB\_AMr230\_e1awfr1005.wv  
IB\_AMr230\_e1awfr1187.wv  
IB\_AMr230\_e1awfr1261.wv  
IB\_AMr230a\_e1awfr1001.wv  
IB\_AMr230a\_e1awfr1002.wv  
IB\_AMr230b\_e1awfc102.wv  
IB\_AMr230d\_e1awfr12.wv  
IB\_AMr430\_e1wfr1016.wv  
IB\_AMr430\_e1wfr1017.wv  
IB\_AMr430\_e1wfr1018.wv  
IB\_AMr430\_e1wfr1019.wv  
IB\_AMr430\_e1wfr1020.wv  
IB\_AMr430\_e1wfr1021.wv  
IB\_AMr430\_e1wfr1022.wv  
IB\_AMr430\_e1wfr1023.wv  
IB\_AMr430\_e1wfr1024.wv  
IB\_AMr430\_e1wfr1025.wv  
IB\_AMr430\_e1wfr1026.wv  
IB\_AMr430\_e1wfr1027.wv  
IB\_AMr430\_e1wfr1028.wv  
IB\_AMr440\_e1wfr1116.wv  
IB\_AMr440\_e1wfr1117.wv

## 3.2 CC Folder

Contains the following waveform files, listed in alphabetical order:

CC\_TTN\_FMr440a\_e1wfr001.wv  
CC\_TTN\_FMr440a\_e1wfr002.wv  
CC\_TTN\_FMr440a\_e1wfr003.wv  
CC\_TTN\_FMr440a\_e1wfr004.wv  
CC\_TTN\_FMr440a\_e1wfr005.wv  
CC\_TTN\_FMr440a\_e1wfr006.wv

CC\_TTN\_FMr440a\_e1wfr007.wv  
CC\_TTN\_FMr440a\_e1wfr008.wv  
CC\_TTN\_FMr440a\_e1wfr009.wv  
CC\_TTN\_FMr440a\_e1wfr010.wv  
CC\_TTN\_FMr440a\_e1wfr011.wv  
CC\_TTN\_FMr440a\_e1wfr012.wv  
CC\_TTN\_FMr440a\_e1wfr013.wv  
CC\_TTN\_FMr440a\_e1wfr014.wv  
CC\_TTN\_FMr440a\_e1wfr015.wv  
CC\_TTN\_FMr440a\_e1wfr016.wv  
CC\_TTN\_FMr440a\_e1wfr017.wv  
CC\_TTN\_FMr440a\_e1wfr018.wv  
CC\_TTN\_FMr440a\_e1wfr019.wv  
CC\_TTN\_FMr440a\_e1wfr019b.wv  
CC\_TTN\_FMr440a\_e1wfr020.wv  
CC\_TTN\_FMr440a\_e1wfr020b.wv  
CC\_TTN\_FMr440a\_e1wfr021.wv  
CC\_TTN\_FMr440a\_e1wfr022.wv  
CC\_TTN\_FMr440a\_e1wfr023.wv  
CC\_TTN\_FMr440a\_e1wfr024.wv  
CC\_TTN\_FMr440a\_e1wfr025.wv  
CC\_TTN\_FMr440a\_e1wfr026.wv  
CC\_TTN\_FMr440a\_e1wfr027.wv  
CC\_TTN\_FMr440a\_e1wfr028.wv  
CC\_TTN\_FMr440a\_e1wfr029.wv  
CC\_TTN\_FMr440a\_e1wfr030.wv  
CC\_TTN\_FMr440a\_e1wfr031.wv  
CC\_TTN\_FMr440a\_e1wfr032.wv  
CC\_TTN\_FMr440a\_e1wfr033.wv  
CC\_TTN\_FMr440a\_e1wfr034.wv  
CC\_TTN\_FMr440a\_e1wfr035.wv  
CC\_TTN\_FMr440a\_e1wfr036.wv  
CC\_TTN\_FMr440a\_e1wfr037.wv

CC\_TTN\_FMr440a\_e1wfr038.wv  
CC\_TTN\_FMr440a\_e1wfr039.wv  
CC\_TTN\_FMr440a\_e1wfr040.wv  
CC\_TTN\_FMr440a\_e1wfr041.wv  
CC\_TTN\_FMr440a\_e1wfr042.wv  
CC\_TTN\_FMr440a\_e1wfr043.wv  
CC\_TTN\_FMr440a\_e1wfr044.wv  
CC\_TTN\_FMr440a\_e1wfr045.wv  
CC\_TTN\_FMr440a\_e1wfr046.wv  
CC\_TTN\_FMr440a\_e1wfr047.wv  
CC\_TTN\_FMr440a\_e1wfr048.wv  
CC\_TTN\_FMr440a\_e1wfr049.wv  
CC\_TTN\_FMr440a\_e1wfr049b.wv  
CC\_TTN\_FMr440a\_e1wfr050.wv  
CC\_TTN\_FMr440a\_e1wfr050b.wv  
CC\_TTN\_FMr440a\_e1wfr051.wv  
CC\_TTN\_FMr440a\_e1wfr051b.wv  
CC\_TTN\_FMr440a\_e1wfr052.wv  
CC\_TTN\_FMr440a\_e1wfr053.wv  
CC\_TTN\_FMr440a\_e1wfr054.wv  
CC\_TTN\_FMr440a\_e1wfr055.wv  
CC\_TTN\_FMr440a\_e1wfr056.wv  
CC\_TTN\_FMr440a\_e1wfr057.wv  
CC\_TTN\_FMr440a\_e1wfr058.wv  
CC\_TTN\_FMr440a\_e1wfr065.wv  
CC\_TTN\_FMr440a\_e1wfr070.wv  
CC\_TTN\_FMr440a\_e1wfr071.wv  
CC\_TTN\_FMr440a\_e1wfr072.wv

### 3.3 FM Folder

Contains the following waveform files, listed in alphabetical order:

CC\_FMr440\_e1wfr015\_HighDataRate.wv

CC\_FMr440d\_e1wfr011.wv  
CC\_FMr440d\_e1wfr012.wv  
CC\_FMr440d\_e1wfr013.wv  
CC\_FMr440d\_e1wfr014.wv  
IB\_FM\_e1\_awgn.wv  
IB\_FM\_e1\_CW\_dc.wv  
IB\_FMr001\_e1\_cw\_0\_100.wv  
IB\_FMr001\_e1\_cw\_0\_m100.wv  
IB\_FMr001\_e1\_cw\_0\_m200.wv  
IB\_FMr001\_e1\_cw\_10\_20.wv  
IB\_FMr001\_e1\_cw\_50\_100.wv  
IB\_FMr001\_e1\_cw\_m275\_0\_275.wv  
IB\_FMr001\_e1\_cw\_m50\_0.wv  
IB\_FMr001\_e1\_cw\_m80\_m90.wv  
IB\_FMr201\_e1wfc52.wv  
IB\_FMr201\_e1wfr1189.wv  
IB\_FMr208\_e1wfr1122.wv  
IB\_FMr208\_e1wfr1185.wv  
IB\_FMr208\_e1wfr1246.wv  
IB\_FMr208\_e1wfr1247.wv  
IB\_FMr208\_e1wfr1248.wv  
IB\_FMr208c\_e1wfa05.wv  
IB\_FMr208c\_e1wfa25.wv  
IB\_FMr208c\_e1wfa98.wv  
IB\_FMr208c\_e1wfa99.wv  
IB\_FMr208c\_e1wfc00.wv  
IB\_FMr208c\_e1wfc03.wv  
IB\_FMr208c\_e1wfc08.wv  
IB\_FMr208c\_e1wfc09.wv  
IB\_FMr208c\_e1wfc10.wv  
IB\_FMr208c\_e1wfc201.wv  
IB\_FMr208c\_e1wfc203.wv  
IB\_FMr208c\_e1wfc204.wv

IB\_FMr208c\_e1wfc206.wv  
IB\_FMr208c\_e1wfc209.wv  
IB\_FMr208c\_e1wfc210.wv  
IB\_FMr208c\_e1wfc211.wv  
IB\_FMr208c\_e1wfc227.wv  
IB\_FMr208c\_e1wfc230.wv  
IB\_FMr208c\_e1wfc27.wv  
IB\_FMr208c\_e1wfc28.wv  
IB\_FMr208c\_e1wfc30.wv  
IB\_FMr208c\_e1wfc46.wv  
IB\_FMr208c\_e1wfc546.wv  
IB\_FMr208c\_e1wfc547.wv  
IB\_FMr208c\_e1wfc548.wv  
IB\_FMr208c\_e1wfc90.wv  
IB\_FMr208d\_e1wfa141.wv  
IB\_FMr208d\_e1wfc208.wv  
IB\_FMr208d\_e1wfc538.wv  
IB\_FMr208d\_e1wfc540.wv  
IB\_FMr208d\_e1wfc542.wv  
IB\_FMr208d\_e1wfc549.wv  
IB\_FMr208e\_e1wfc12.wv  
IB\_FMr208e\_e1wfc13.wv  
IB\_FMr208g\_e1wfc94.wv  
IB\_FMr208i\_e1wfa58.wv  
IB\_FMr208j\_e1wfa105.wv  
IB\_FMr208j\_e1wfa106.wv  
IB\_FMr208j\_e1wfa107.wv  
IB\_FMr208j\_e1wfa109.wv  
IB\_FMr208j\_e1wfa11.wv  
IB\_FMr208j\_e1wfc31.wv  
IB\_FMr208j\_e1wfc89.wv  
IB\_FMr220\_e1wfa108.wv  
IB\_FMr220a\_e1wfc100.wv

IB\_FMr220a\_e1wfc101.wv  
IB\_FMr220a\_e1wfc553.wv  
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IB\_FMr220c\_e1wfr1191.wv  
IB\_FMr230\_e1wfc14.wv  
IB\_FMr230\_e1wfr1061.wv  
IB\_FMr230\_e1wfr143.wv  
IB\_FMr230a\_e1wfa153.wv  
IB\_FMr230a\_e1wfc102.wv  
IB\_FMr230a\_e1wfr1000.wv  
IB\_FMr230a\_e1wfr1001.wv  
IB\_FMr230a\_e1wfr1003.wv  
IB\_FMr230a\_e1wfr1004.wv  
IB\_FMr230a\_e1wfr1005.wv  
IB\_FMr230a\_e1wfr1006.wv  
IB\_FMr230a\_e1wfr1007.wv  
IB\_FMr230a\_e1wfr1008.wv  
IB\_FMr230a\_e1wfr1009.wv  
IB\_FMr230a\_e1wfr1011.wv  
IB\_FMr230a\_e1wfr1012.wv  
IB\_FMr230a\_e1wfr1013.wv  
IB\_FMr230a\_e1wfr1037.wv  
IB\_FMr230b\_e1wfr1002.wv  
IB\_FMr230b\_e1wfr1010.wv  
IB\_FMr230b\_e1wfr1024.wv  
IB\_FMr230c\_e1wfd204.wv  
IB\_FMr230c\_e1wfr1022.wv  
IB\_FMr230c\_e1wfr1032.wv  
IB\_FMr230d\_e1wfa78.wv  
IB\_FMr230d\_e1wfr1025.wv  
IB\_FMr230f\_e1wfr1023.wv  
IB\_FMr430\_e1wfr1070.wv

IB\_FMr430\_e1wfr1071.wv  
IB\_FMr430\_e1wfr1072.wv  
IB\_FMr430\_e1wfr1073.wv  
IB\_FMr430\_e1wfr1074.wv  
IB\_FMr430\_e1wfr1075.wv  
IB\_FMr430\_e1wfr1080.wv  
IB\_FMr430\_e1wfr1082.wv  
IB\_FMr430\_e1wfr1083.wv  
IB\_FMr430\_e1wfr1086.wv  
IB\_FMr430\_e1wfr1087.wv  
IB\_FMr430\_e1wfr1088.wv  
IB\_FMr430\_e1wfr1089.wv  
IB\_FMr430\_e1wfr1090.wv  
IB\_FMr430\_e1wfr1091.wv  
IB\_FMr430\_e1wfr1092.wv  
IB\_FMr430\_e1wfr1093.wv  
IB\_FMr430\_e1wfr1094.wv  
IB\_FMr430\_e1wfr1095.wv  
IB\_FMr430\_e1wfr1096.wv  
IB\_FMr430\_e1wfr1097.wv  
IB\_FMr430\_e1wfr1098.wv  
IB\_FMr430\_e1wfr1099.wv  
IB\_FMr430\_e1wfr1100.wv  
IB\_FMr430\_e1wfr1101.wv  
IB\_FMr430\_e1wfr1102.wv  
IB\_FMr430\_e1wfr1152.wv  
IB\_FMr430a\_e1wfr1081.wv  
IB\_FMr430a\_e1wfr1085.wv  
IB\_FMr440\_e1wfr1111.wv  
IB\_FMr440\_e1wfr1112.wv  
IB\_FMr440\_e1wfr1113.wv  
IB\_FMr440\_e1wfr1114.wv  
IB\_FMr440\_e1wfr1115.wv

IB\_FMr440\_e1wfr1243.wv

IB\_FMr440\_e1wfr1251.wv

IB\_FMr440\_e1wfr1252.wv

IB\_FMr440\_e1wfr1253.wv

IB\_FMr440\_e1wfr1254.wv

IB\_FMr440\_e1wfr1255.wv

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