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

Manual

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Test & Measurement

Manual

ROHDE&SCHWARZ

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®SMBV is abbreviated as R&S SMBV, R&S®SMJ is abbreviated as R&S SMJ, R&S®SMU is abbreviated as R&S SMU, R&S®AFQ is abbreviated as R&S AFQ

Basic Safety Instructions

Always read through and comply with the following safety instructions!

All plants and locations of the Rohde & Schwarz group of companies make every effort to keep the safety standards of our products up to date and to offer our customers the highest possible degree of safety. Our products and the auxiliary equipment they require are designed, built and tested in accordance with the safety standards that apply in each case. Compliance with these standards is continuously monitored by our quality assurance system. The product described here has been designed, built and tested in accordance with the attached EC Certificate of Conformity and has left the manufacturer's plant in a condition fully complying with safety standards. To maintain this condition and to ensure safe operation, you must observe all instructions and warnings provided in this manual. If you have any questions regarding these safety instructions, the Rohde & Schwarz group of companies will be happy to answer them.

Furthermore, it is your responsibility to use the product in an appropriate manner. This product is designed for use solely in industrial and laboratory environments or, if expressly permitted, also in the field and must not be used in any way that may cause personal injury or property damage. You are responsible if the product is used for any intention other than its designated purpose or in disregard of the manufacturer's instructions. The manufacturer shall assume no responsibility for such use of the product.

The product is used for its designated purpose if it is used in accordance with its product documentation and within its performance limits (see data sheet, documentation, the following safety instructions). Using the product requires technical skills and a basic knowledge of English. It is therefore essential that only skilled and specialized staff or thoroughly trained personnel with the required skills be allowed to use the product. If personal safety gear is required for using Rohde & Schwarz products, this will be indicated at the appropriate place in the product documentation. Keep the basic safety instructions and the product documentation in a safe place and pass them on to the subsequent users.

Observing the safety instructions will help prevent personal injury or damage of any kind caused by dangerous situations. Therefore, carefully read through and adhere to the following safety instructions before and when using the product. It is also absolutely essential to observe the additional safety instructions on personal safety, for example, that appear in relevant parts of the product documentation. In these safety instructions, the word "product" refers to all merchandise sold and distributed by the Rohde & Schwarz group of companies, including instruments, systems and all accessories.

Symbols and safety labels

							
Notice, general danger location Observe product documentation	Caution when handling heavy equipment	Danger of electric shock	Warning! Hot surface	PE terminal	Ground	Ground terminal	Be careful when handling electrostatic sensitive devices

					
ON/OFF supply voltage	Standby indication	Direct current (DC)	Alternating current (AC)	Direct/alternating current (DC/AC)	Device fully protected by double (reinforced) insulation

Tags and their meaning

The following signal words are used in the product documentation in order to warn the reader about risks and dangers.

indicates a hazardous situation which, if not avoided, will result in death or serious injury.

indicates a hazardous situation which, if not avoided, could result in death or serious injury.

indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

indicates the possibility of incorrect operation which can result in damage to the product.
In the product documentation, the word ATTENTION is used synonymously.

These tags are in accordance with the standard definition for civil applications in the European Economic Area. Definitions that deviate from the standard definition may also exist in other economic areas or military applications. It is therefore essential to make sure that the tags described here are always used only in connection with the related product documentation and the related product. The use of tags in connection with unrelated products or documentation can result in misinterpretation and in personal injury or material damage.

Operating states and operating positions

The product may be operated only under the operating conditions and in the positions specified by the manufacturer, without the product's ventilation being obstructed. If the manufacturer's specifications are not observed, this can result in electric shock, fire and/or serious personal injury or death. Applicable local or national safety regulations and rules for the prevention of accidents must be observed in all work performed.

1. Unless otherwise specified, the following requirements apply to Rohde & Schwarz products: predefined operating position is always with the housing floor facing down, IP protection 2X, pollution severity 2, overvoltage category 2, use only indoors, max. operating altitude 2000 m above sea level, max. transport altitude 4500 m above sea level. A tolerance of ±10 % shall apply to the nominal voltage and ±5 % to the nominal frequency.
2. Do not place the product on surfaces, vehicles, cabinets or tables that for reasons of weight or stability are unsuitable for this purpose. Always follow the manufacturer's installation instructions when installing the product and fastening it to objects or structures (e.g. walls and shelves). An installation that is not carried out as described in the product documentation could result in personal injury or death.
3. Do not place the product on heat-generating devices such as radiators or fan heaters. The ambient temperature must not exceed the maximum temperature specified in the product documentation or in the data sheet. Product overheating can cause electric shock, fire and/or serious personal injury or death.

Electrical safety

If the information on electrical safety is not observed either at all to the extent necessary, electric shock, fire and/or serious personal injury or death may occur.

1. Prior to switching on the product, always ensure that the nominal voltage setting on the product matches the nominal voltage of the AC supply network. If a different voltage is to be set, the power fuse of the product may have to be changed accordingly.
2. In the case of products of safety class I with movable power cord and connector, operation is permitted only on sockets with an earthing contact and protective earth connection.
3. Intentionally breaking the protective earth connection either in the feed line or in the product itself is not permitted. Doing so can result in the danger of an electric shock from the product. If extension cords or connector strips are implemented, they must be checked on a regular basis to ensure that they are safe to use.
4. If the product does not have a power switch for disconnection from the AC supply network, the plug of the connecting cable is regarded as the disconnecting device. In such cases, always ensure that the power plug is easily reachable and accessible at all times (corresponding to the length of connecting cable, approx. 2 m). Functional or electronic switches are not suitable for providing disconnection from the AC supply network. If products without power switches are integrated into racks or systems, a disconnecting device must be provided at the system level.
5. Never use the product if the power cable is damaged. Check the power cable on a regular basis to ensure that it is in proper operating condition. By taking appropriate safety measures and carefully laying the power cable, you can ensure that the cable will not be damaged and that no one can be hurt by, for example, tripping over the cable or suffering an electric shock.
6. The product may be operated only from TN/TT supply networks fused with max. 16 A (higher fuse only after consulting with the Rohde & Schwarz group of companies).
7. Do not insert the plug into sockets that are dusty or dirty. Insert the plug firmly and all the way into the socket. Otherwise, sparks that result in fire and/or injuries may occur.
8. Do not overload any sockets, extension cords or connector strips; doing so can cause fire or electric shocks.
9. For measurements in circuits with voltages V_{rms} > 30 V, suitable measures (e.g. appropriate measuring equipment, fusing, current limiting, electrical separation, insulation) should be taken to avoid any hazards.
10. Ensure that the connections with information technology equipment, e.g. PCs or other industrial computers, comply with the IEC60950-1/EN60950-1 or IEC61010-1/EN 61010-1 standards that apply in each case.
11. Unless expressly permitted, never remove the cover or any part of the housing while the product is in operation. Doing so will expose circuits and components and can lead to injuries, fire or damage to the product.
12. If a product is to be permanently installed, the connection between the PE terminal on site and the product's PE conductor must be made first before any other connection is made. The product may be installed and connected only by a licensed electrician.
13. For permanently installed equipment without built-in fuses, circuit breakers or similar protective devices, the supply circuit must be fused in such a way that anyone who has access to the product, as well as the product itself, is adequately protected from injury or damage.

14. Use suitable overvoltage protection to ensure that no overvoltage (such as that caused by a bolt of lightning) can reach the product. Otherwise, the person operating the product will be exposed to the danger of an electric shock.
15. Any object that is not designed to be placed in the openings of the housing must not be used for this purpose. Doing so can cause short circuits inside the product and/or electric shocks, fire or injuries.
16. Unless specified otherwise, products are not liquid-proof (see also section "Operating states and operating positions", item 1. Therefore, the equipment must be protected against penetration by liquids. If the necessary precautions are not taken, the user may suffer electric shock or the product itself may be damaged, which can also lead to personal injury.
17. Never use the product under conditions in which condensation has formed or can form in or on the product, e.g. if the product has been moved from a cold to a warm environment. Penetration by water increases the risk of electric shock.
18. Prior to cleaning the product, disconnect it completely from the power supply (e.g. AC supply network or battery). Use a soft, non-linting cloth to clean the product. Never use chemical cleaning agents such as alcohol, acetone or diluents for cellulose lacquers.

Operation

1. Operating the products requires special training and intense concentration. Make sure that persons who use the products are physically, mentally and emotionally fit enough to do so; otherwise, injuries or material damage may occur. It is the responsibility of the employer/operator to select suitable personnel for operating the products.
2. Before you move or transport the product, read and observe the section titled "Transport".
3. As with all industrially manufactured goods, the use of substances that induce an allergic reaction (allergens) such as nickel cannot be generally excluded. If you develop an allergic reaction (such as a skin rash, frequent sneezing, red eyes or respiratory difficulties) when using a Rohde & Schwarz product, consult a physician immediately to determine the cause and to prevent health problems or stress.
4. Before you start processing the product mechanically and/or thermally, or before you take it apart, be sure to read and pay special attention to the section titled "Waste disposal", item 1.
5. Depending on the function, certain products such as RF radio equipment can produce an elevated level of electromagnetic radiation. Considering that unborn babies require increased protection, pregnant women must be protected by appropriate measures. Persons with pacemakers may also be exposed to risks from electromagnetic radiation. The employer/operator must evaluate workplaces where there is a special risk of exposure to radiation and, if necessary, take measures to avert the potential danger.
6. Should a fire occur, the product may release hazardous substances (gases, fluids, etc.) that can cause health problems. Therefore, suitable measures must be taken, e.g. protective masks and protective clothing must be worn.
7. If a laser product (e.g. a CD/DVD drive) is integrated into a Rohde & Schwarz product, absolutely no other settings or functions may be used as described in the product documentation. The objective is to prevent personal injury (e.g. due to laser beams).

Repair and service

1. The product may be opened only by authorized, specially trained personnel. Before any work is performed on the product or before the product is opened, it must be disconnected from the AC supply network. Otherwise, personnel will be exposed to the risk of an electric shock.
2. Adjustments, replacement of parts, maintenance and repair may be performed only by electrical experts authorized by Rohde & Schwarz. Only original parts may be used for replacing parts relevant to safety (e.g. power switches, power transformers, fuses). A safety test must always be performed after parts relevant to safety have been replaced (visual inspection, PE conductor test, insulation resistance measurement, leakage current measurement, functional test). This helps ensure the continued safety of the product.

Batteries and rechargeable batteries/cells

If the information regarding batteries and rechargeable batteries/cells is not observed either at all or to the extent necessary, product users may be exposed to the risk of explosions, fire and/or serious personal injury, and, in some cases, death. Batteries and rechargeable batteries with alkaline electrolytes (e.g. lithium cells) must be handled in accordance with the EN 62133 standard.

1. Cells must not be taken apart or crushed.
2. Cells or batteries must not be exposed to heat or fire. Storage in direct sunlight must be avoided. Keep cells and batteries clean and dry. Clean soiled connectors using a dry, clean cloth.
3. Cells or batteries must not be short-circuited. Cells or batteries must not be stored in a box or in a drawer where they can short-circuit each other, or where they can be short-circuited by other conductive materials. Cells and batteries must not be removed from their original packaging until they are ready to be used.
4. Keep cells and batteries out of the hands of children. If a cell or a battery has been swallowed, seek medical aid immediately.
5. Cells and batteries must not be exposed to any mechanical shocks that are stronger than permitted.
6. If a cell develops a leak, the fluid must not be allowed to come into contact with the skin or eyes. If contact occurs, wash the affected area with plenty of water and seek medical aid.
7. Improperly replacing or charging cells or batteries that contain alkaline electrolytes (e.g. lithium cells) can cause explosions. Replace cells or batteries only with the matching Rohde & Schwarz type (see parts list) in order to ensure the safety of the product.
8. Cells and batteries must be recycled and kept separate from residual waste. Rechargeable batteries and normal batteries that contain lead, mercury or cadmium are hazardous waste. Observe the national regulations regarding waste disposal and recycling.

Transport

1. The product may be very heavy. Therefore, the product must be handled with care. In some cases, the user may require a suitable means of lifting or moving the product (e.g. with a lift-truck) to avoid back or other physical injuries.

2. Handles on the products are designed exclusively to enable personnel to transport the product. It is therefore not permissible to use handles to fasten the product to or on transport equipment such as cranes, fork lifts, wagons, etc. The user is responsible for securely fastening the products to or on the means of transport or lifting. Observe the safety regulations of the manufacturer of the means of transport or lifting. Noncompliance can result in personal injury or material damage.
3. If you use the product in a vehicle, it is the sole responsibility of the driver to drive the vehicle safely and properly. The manufacturer assumes no responsibility for accidents or collisions. Never use the product in a moving vehicle if doing so could distract the driver of the vehicle. Adequately secure the product in the vehicle to prevent injuries or other damage in the event of an accident.

Waste disposal

1. If products or their components are mechanically and/or thermally processed in a manner that goes beyond their intended use, hazardous substances (heavy-metal dust such as lead, beryllium, nickel) may be released. For this reason, the product may only be disassembled by specially trained personnel. Improper disassembly may be hazardous to your health. National waste disposal regulations must be observed.
2. If handling the product releases hazardous substances or fuels that must be disposed of in a special way, e.g. coolants or engine oils that must be replenished regularly, the safety instructions of the manufacturer of the hazardous substances or fuels and the applicable regional waste disposal regulations must be observed. Also observe the relevant safety instructions in the product documentation. The improper disposal of hazardous substances or fuels can cause health problems and lead to environmental damage.

Informaciones elementales de seguridad

Es imprescindible leer y observar las siguientes instrucciones e informaciones de seguridad!

El principio del grupo de empresas Rohde & Schwarz consiste en tener nuestros productos siempre al día con los estándares de seguridad y de ofrecer a nuestros clientes el máximo grado de seguridad. Nuestros productos y todos los equipos adicionales son siempre fabricados y examinados según las normas de seguridad vigentes. Nuestro sistema de garantía de calidad controla constantemente que sean cumplidas estas normas. El presente producto ha sido fabricado y examinado según el certificado de conformidad adjunto de la UE y ha salido de nuestra planta en estado impecable según los estándares técnicos de seguridad. Para poder preservar este estado y garantizar un funcionamiento libre de peligros, el usuario deberá atenerse a todas las indicaciones, informaciones de seguridad y notas de alerta. El grupo de empresas Rohde & Schwarz está siempre a su disposición en caso de que tengan preguntas referentes a estas informaciones de seguridad.

Además queda en la responsabilidad del usuario utilizar el producto en la forma debida. Este producto está destinado exclusivamente al uso en la industria y el laboratorio o, si ha sido expresamente autorizado, para aplicaciones de campo y de ninguna manera deberá ser utilizado de modo que alguna persona/cosa pueda sufrir daño. El uso del producto fuera de sus fines definidos o sin tener en cuenta las instrucciones del fabricante queda en la responsabilidad del usuario. El fabricante no se hace en ninguna forma responsable de consecuencias a causa del mal uso del producto.

Se parte del uso correcto del producto para los fines definidos si el producto es utilizado conforme a las indicaciones de la correspondiente documentación del producto y dentro del margen de rendimiento definido (ver hoja de datos, documentación, informaciones de seguridad que siguen). El uso del producto hace necesarios conocimientos técnicos y ciertos conocimientos del idioma inglés. Por eso se debe tener en cuenta que el producto solo pueda ser operado por personal especializado o personas instruidas en profundidad con las capacidades correspondientes. Si fuera necesaria indumentaria de seguridad para el uso de productos de Rohde & Schwarz, encontraría la información debida en la documentación del producto en el capítulo correspondiente. Guarde bien las informaciones de seguridad elementales, así como la documentación del producto, y entréguelas a usuarios posteriores.

Tener en cuenta las informaciones de seguridad sirve para evitar en lo posible lesiones o daños por peligros de toda clase. Por eso es imprescindible leer detalladamente y comprender por completo las siguientes informaciones de seguridad antes de usar el producto, y respetarlas durante el uso del producto. Deberán tenerse en cuenta todas las demás informaciones de seguridad, como p. ej. las referentes a la protección de personas, que encontrarán en el capítulo correspondiente de la documentación del producto y que también son de obligado cumplimiento. En las presentes informaciones de seguridad se recogen todos los objetos que distribuye el grupo de empresas Rohde & Schwarz bajo la denominación de "producto", entre ellos también aparatos, instalaciones así como toda clase de accesorios.

Símbolos y definiciones de seguridad

							
Aviso: punto de peligro general Observar la documentación del producto	Atención en el manejo de dispositivos de peso elevado	Peligro de choque eléctrico	Adver-tencia: superficie caliente	Conexión a conductor de protección	Conexión a tierra	Conexión a masa	Aviso: Cuidado en el manejo de dispositivos sensibles a la electrostática (ESD)

					
Tensión de alimentación de PUESTA EN MARCHA / PARADA	Indicación de estado de espera (Standby)	Corriente continua (DC)	Corriente alterna (AC)	Corriente continua / Corriente alterna (DC/AC)	El aparato está protegido en su totalidad por un aislamiento doble (reforzado)

Palabras de señal y su significado

En la documentación del producto se utilizan las siguientes palabras de señal con el fin de advertir contra riesgos y peligros.

PELIGRO identifica un peligro inminente con riesgo elevado que provocará muerte o lesiones graves si no se evita.

ADVERTENCIA identifica un posible peligro con riesgo medio de provocar muerte o lesiones (graves) si no se evita.

ATENCIÓN identifica un peligro con riesgo reducido de provocar lesiones leves o moderadas si no se evita.

AVISO indica la posibilidad de utilizar mal el producto y, como consecuencia, dañarlo.
En la documentación del producto se emplea de forma sinónima el término CUIDADO.

Las palabras de señal corresponden a la definición habitual para aplicaciones civiles en el área económica europea. Pueden existir definiciones diferentes a esta definición en otras áreas económicas o en aplicaciones militares. Por eso se deberá tener en cuenta que las palabras de señal aquí descritas sean utilizadas siempre solamente en combinación con la correspondiente documentación del producto y solamente en combinación con el producto correspondiente. La utilización de las palabras de señal en combinación con productos o documentaciones que no les correspondan puede llevar a interpretaciones equivocadas y tener por consecuencia daños en personas u objetos.

Estados operativos y posiciones de funcionamiento

El producto solamente debe ser utilizado según lo indicado por el fabricante respecto a los estados operativos y posiciones de funcionamiento sin que se obstruya la ventilación. Si no se siguen las indicaciones del fabricante, pueden producirse choques eléctricos, incendios y/o lesiones graves con posible consecuencia de muerte. En todos los trabajos deberán ser tenidas en cuenta las normas nacionales y locales de seguridad del trabajo y de prevención de accidentes.

1. Si no se convino de otra manera, es para los productos Rohde & Schwarz válido lo que sigue: como posición de funcionamiento se define por principio la posición con el suelo de la caja para abajo, modo de protección IP 2X, grado de suciedad 2, categoría de sobrecarga eléctrica 2, uso solamente en estancias interiores, utilización hasta 2000 m sobre el nivel del mar, transporte hasta 4500 m sobre el nivel del mar. Se aplicará una tolerancia de ±10 % sobre el voltaje nominal y de ±5 % sobre la frecuencia nominal.
2. No sitúe el producto encima de superficies, vehículos, estantes o mesas, que por sus características de peso o de estabilidad no sean aptos para él. Siga siempre las instrucciones de instalación del fabricante cuando instale y asegure el producto en objetos o estructuras (p. ej. paredes y estantes). Si se realiza la instalación de modo distinto al indicado en la documentación del producto, pueden causarse lesiones o incluso la muerte.
3. No ponga el producto sobre aparatos que generen calor (p. ej. radiadores o calefactores). La temperatura ambiente no debe superar la temperatura máxima especificada en la documentación del producto o en la hoja de datos. En caso de sobrecalentamiento del producto, pueden producirse choques eléctricos, incendios y/o lesiones graves con posible consecuencia de muerte.

Seguridad eléctrica

Si no se siguen (o se siguen de modo insuficiente) las indicaciones del fabricante en cuanto a seguridad eléctrica, pueden producirse choques eléctricos, incendios y/o lesiones graves con posible consecuencia de muerte.

1. Antes de la puesta en marcha del producto se deberá comprobar siempre que la tensión preseleccionada en el producto coincida con la de la red de alimentación eléctrica. Si es necesario modificar el ajuste de tensión, también se deberán cambiar en caso dado los fusibles correspondientes del producto.
2. Los productos de la clase de protección I con alimentación móvil y enchufe individual solamente podrán enchufarse a tomas de corriente con contacto de seguridad y con conductor de protección conectado.
3. Queda prohibida la interrupción intencionada del conductor de protección, tanto en la toma de corriente como en el mismo producto. La interrupción puede tener como consecuencia el riesgo de que el producto sea fuente de choques eléctricos. Si se utilizan cables alargadores o regletas de enchufe, deberá garantizarse la realización de un examen regular de los mismos en cuanto a su estado técnico de seguridad.
4. Si el producto no está equipado con un interruptor para desconectarlo de la red, se deberá considerar el enchufe del cable de conexión como interruptor. En estos casos se deberá asegurar que el enchufe siempre sea de fácil acceso (de acuerdo con la longitud del cable de conexión, aproximadamente 2 m). Los interruptores de función o electrónicos no son aptos para el corte de la red eléctrica. Si los productos sin interruptor están integrados en bastidores o instalaciones, se deberá colocar el interruptor en el nivel de la instalación.
5. No utilice nunca el producto si está dañado el cable de conexión a red. Compruebe regularmente el correcto estado de los cables de conexión a red. Asegúrese, mediante las medidas de protección y de instalación adecuadas, de que el cable de conexión a red no pueda ser dañado o de que nadie pueda ser dañado por él, p. ej. al tropezar o por un choque eléctrico.
6. Solamente está permitido el funcionamiento en redes de alimentación TN/TT aseguradas con fusibles de 16 A como máximo (utilización de fusibles de mayor amperaje solo previa consulta con el grupo de empresas Rohde & Schwarz).
7. Nunca conecte el enchufe en tomas de corriente sucias o llenas de polvo. Introduzca el enchufe por completo y fuertemente en la toma de corriente. La no observación de estas medidas puede provocar chispas, fuego y/o lesiones.
8. No sobrecargue las tomas de corriente, los cables alargadores o las regletas de enchufe ya que esto podría causar fuego o choques eléctricos.
9. En las mediciones en circuitos de corriente con una tensión U_{eff} > 30 V se deberán tomar las medidas apropiadas para impedir cualquier peligro (p. ej. medios de medición adecuados, seguros, limitación de tensión, corte protector, aislamiento etc.).
10. Para la conexión con dispositivos informáticos como un PC o un ordenador industrial, debe comprobarse que éstos cumplan los estándares IEC60950-1/EN60950-1 o IEC61010-1/EN 61010-1 válidos en cada caso.
11. A menos que esté permitido expresamente, no retire nunca la tapa ni componentes de la carcasa mientras el producto esté en servicio. Esto pone a descubierto los cables y componentes eléctricos y puede causar lesiones, fuego o daños en el producto.

12. Si un producto se instala en un lugar fijo, se deberá primero conectar el conductor de protección fijo con el conductor de protección del producto antes de hacer cualquier otra conexión. La instalación y la conexión deberán ser efectuadas por un electricista especializado.
13. En el caso de dispositivos fijos que no estén provistos de fusibles, interruptor automático ni otros mecanismos de seguridad similares, el circuito de alimentación debe estar protegido de modo que todas las personas que puedan acceder al producto, así como el producto mismo, estén a salvo de posibles daños.
14. Todo producto debe estar protegido contra sobretensión (debida p. ej. a una caída del rayo) mediante los correspondientes sistemas de protección. Si no, el personal que lo utilice quedará expuesto al peligro de choque eléctrico.
15. No debe introducirse en los orificios de la caja del aparato ningún objeto que no esté destinado a ello. Esto puede producir cortocircuitos en el producto y/o puede causar choques eléctricos, fuego o lesiones.
16. Salvo indicación contraria, los productos no están impermeabilizados (ver también el capítulo "Estados operativos y posiciones de funcionamiento", punto 1). Por eso es necesario tomar las medidas necesarias para evitar la entrada de líquidos. En caso contrario, existe peligro de choque eléctrico para el usuario o de daños en el producto, que también pueden redundar en peligro para las personas.
17. No utilice el producto en condiciones en las que pueda producirse o ya se hayan producido condensaciones sobre el producto o en el interior de éste, como p. ej. al desplazarlo de un lugar frío a otro caliente. La entrada de agua aumenta el riesgo de choque eléctrico.
18. Antes de la limpieza, desconecte por completo el producto de la alimentación de tensión (p. ej. red de alimentación o batería). Realice la limpieza de los aparatos con un paño suave, que no se deshilache. No utilice bajo ningún concepto productos de limpieza químicos como alcohol, acetona o diluyentes para lacas nitrocelulósicas.

Funcionamiento

1. El uso del producto requiere instrucciones especiales y una alta concentración durante el manejo. Debe asegurarse que las personas que manejen el producto estén a la altura de los requerimientos necesarios en cuanto a aptitudes físicas, psíquicas y emocionales, ya que de otra manera no se pueden excluir lesiones o daños de objetos. El empresario u operador es responsable de seleccionar el personal usuario apto para el manejo del producto.
2. Antes de desplazar o transportar el producto, lea y tenga en cuenta el capítulo "Transporte".
3. Como con todo producto de fabricación industrial no puede quedar excluida en general la posibilidad de que se produzcan alergias provocadas por algunos materiales empleados, los llamados alérgenos (p. ej. el níquel). Si durante el manejo de productos Rohde & Schwarz se producen reacciones alérgicas, como p. ej. irritaciones cutáneas, estornudos continuos, enrojecimiento de la conjuntiva o dificultades respiratorias, debe avisarse inmediatamente a un médico para investigar las causas y evitar cualquier molestia o daño a la salud.
4. Antes de la manipulación mecánica y/o térmica o el desmontaje del producto, debe tenerse en cuenta imprescindiblemente el capítulo "Eliminación", punto 1.

5. Ciertos productos, como p. ej. las instalaciones de radiocomunicación RF, pueden a causa de su función natural, emitir una radiación electromagnética aumentada. Deben tomarse todas las medidas necesarias para la protección de las mujeres embarazadas. También las personas con marcapasos pueden correr peligro a causa de la radiación electromagnética. El empresario/operador tiene la obligación de evaluar y señalizar las áreas de trabajo en las que exista un riesgo elevado de exposición a radiaciones.
6. Tenga en cuenta que en caso de incendio pueden desprenderse del producto sustancias tóxicas (gases, líquidos etc.) que pueden generar daños a la salud. Por eso, en caso de incendio deben usarse medidas adecuadas, como p. ej. máscaras antigás e indumentaria de protección.
7. En caso de que un producto Rohde & Schwarz contenga un producto láser (p. ej. un lector de CD/DVD), no debe usarse ninguna otra configuración o función aparte de las descritas en la documentación del producto, a fin de evitar lesiones (p. ej. debidas a irradiación láser).

Reparación y mantenimiento

1. El producto solamente debe ser abierto por personal especializado con autorización para ello. Antes de manipular el producto o abrirlo, es obligatorio desconectarlo de la tensión de alimentación, para evitar toda posibilidad de choque eléctrico.
2. El ajuste, el cambio de partes, el mantenimiento y la reparación deberán ser efectuadas solamente por electricistas autorizados por Rohde & Schwarz. Si se reponen partes con importancia para los aspectos de seguridad (p. ej. el enchufe, los transformadores o los fusibles), solamente podrán ser sustituidos por partes originales. Después de cada cambio de partes relevantes para la seguridad deberá realizarse un control de seguridad (control a primera vista, control del conductor de protección, medición de resistencia de aislamiento, medición de la corriente de fuga, control de funcionamiento). Con esto queda garantizada la seguridad del producto.

Baterías y acumuladores o celdas

Si no se siguen (o se siguen de modo insuficiente) las indicaciones en cuanto a las baterías y acumuladores o celdas, pueden producirse explosiones, incendios y/o lesiones graves con posible consecuencia de muerte. El manejo de baterías y acumuladores con electrolitos alcalinos (p. ej. celdas de litio) debe seguir el estándar EN 62133.

1. No deben desmontarse, abrirse ni triturarse las celdas.
2. Las celdas o baterías no deben someterse a calor ni fuego. Debe evitarse el almacenamiento a la luz directa del sol. Las celdas y baterías deben mantenerse limpias y secas. Limpiar las conexiones sucias con un paño seco y limpio.
3. Las celdas o baterías no deben cortocircuitarse. Es peligroso almacenar las celdas o baterías en estuches o cajones en cuyo interior puedan cortocircuitarse por contacto recíproco o por contacto con otros materiales conductores. No deben extraerse las celdas o baterías de sus embalajes originales hasta el momento en que vayan a utilizarse.
4. Mantener baterías y celdas fuera del alcance de los niños. En caso de ingestión de una celda o batería, avisar inmediatamente a un médico.
5. Las celdas o baterías no deben someterse a impactos mecánicos fuertes indebidos.

6. En caso de falta de estanqueidad de una celda, el líquido vertido no debe entrar en contacto con la piel ni los ojos. Si se produce contacto, lavar con agua abundante la zona afectada y avisar a un médico.
7. En caso de cambio o recarga inadecuados, las celdas o baterías que contienen electrolitos alcalinos (p. ej. las celdas de litio) pueden explotar. Para garantizar la seguridad del producto, las celdas o baterías solo deben ser sustituidas por el tipo Rohde & Schwarz correspondiente (ver lista de recambios).
8. Las baterías y celdas deben reciclarse y no deben tirarse a la basura doméstica. Las baterías o acumuladores que contienen plomo, mercurio o cadmio deben tratarse como residuos especiales. Respete en esta relación las normas nacionales de eliminación y reciclaje.

Transporte

1. El producto puede tener un peso elevado. Por eso es necesario desplazarlo o transportarlo con precaución y, si es necesario, usando un sistema de elevación adecuado (p. ej. una carretilla elevadora), a fin de evitar lesiones en la espalda u otros daños personales.
2. Las asas instaladas en los productos sirven solamente de ayuda para el transporte del producto por personas. Por eso no está permitido utilizar las asas para la sujeción en o sobre medios de transporte como p. ej. grúas, carretillas elevadoras de horquilla, carros etc. Es responsabilidad suya fijar los productos de manera segura a los medios de transporte o elevación. Para evitar daños personales o daños en el producto, siga las instrucciones de seguridad del fabricante del medio de transporte o elevación utilizado.
3. Si se utiliza el producto dentro de un vehículo, recae de manera exclusiva en el conductor la responsabilidad de conducir el vehículo de manera segura y adecuada. El fabricante no asumirá ninguna responsabilidad por accidentes o colisiones. No utilice nunca el producto dentro de un vehículo en movimiento si esto pudiera distraer al conductor. Asegure el producto dentro del vehículo debidamente para evitar, en caso de un accidente, lesiones u otra clase de daños.

Eliminación

1. Si se trabaja de manera mecánica y/o térmica cualquier producto o componente más allá del funcionamiento previsto, pueden liberarse sustancias peligrosas (polvos con contenido de metales pesados como p. ej. plomo, berilio o níquel). Por eso el producto solo debe ser desmontado por personal especializado con formación adecuada. Un desmontaje inadecuado puede ocasionar daños para la salud. Se deben tener en cuenta las directivas nacionales referentes a la eliminación de residuos.
2. En caso de que durante el trato del producto se formen sustancias peligrosas o combustibles que deban tratarse como residuos especiales (p. ej. refrigerantes o aceites de motor con intervalos de cambio definidos), deben tenerse en cuenta las indicaciones de seguridad del fabricante de dichas sustancias y las normas regionales de eliminación de residuos. Tenga en cuenta también en caso necesario las indicaciones de seguridad especiales contenidas en la documentación del producto. La eliminación incorrecta de sustancias peligrosas o combustibles puede causar daños a la salud o daños al medio ambiente.

Qualitätszertifikat
Certificate of quality
Certificat de qualité

Certified Quality System
ISO 9001

Certified Environmental System
ISO 14001

Sehr geehrter Kunde,
Sie haben sich für den Kauf eines Rohde&Schwarz-Produktes entschieden. Hiermit erhalten Sie ein nach modernsten Fertigungsmethoden hergestelltes Produkt. Es wurde nach den Regeln unseres Qualitätsmanagementsystems entwickelt, gefertigt und geprüft. Das Rohde&Schwarz-Qualitätsmanagementsystem ist u.a. nach ISO 9001 und ISO 14001 zertifiziert.

Der Umwelt verpflichtet
- Energie-effiziente, RoHS-konforme Produkte
- Kontinuierliche Weiterentwicklung nachhaltiger Umweltkonzepte
- ISO 14001-zertifiziertes Umweltmanagementsystem

Dear Customer,
You have decided to buy a Rohde&Schwarz product. You are thus assured of receiving a product that is manufactured using the most modern methods available. This product was developed, manufactured and tested in compliance with our quality management system standards. The Rohde&Schwarz quality management system is certified according to standards such as ISO 9001 and ISO 14001.

Environmental commitment
- Energy-efficient products
- Continuous improvement in environmental sustainability
- ISO 14001-certified environmental management system

Cher client,
Vous avez choisi d'acheter un produit Rohde&Schwarz. Vous disposez donc d'un produit fabriqué d'après les méthodes les plus avancées. Le développement, la fabrication et les tests respectent nos normes de gestion qualité. Le système de gestion qualité de Rohde&Schwarz a été homologué, entre autres, conformément aux normes ISO 9001 et ISO 14001.

Engagement écologique
- Produits à efficience énergétique
- Amélioration continue de la durabilité environnementale
- Système de gestion de l'environnement certifié selon ISO 14001

ROHDE&SCHWARZ

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Customer Support

Technical support – where and when you need it

For quick, expert help with any Rohde & Schwarz equipment, contact one of our Customer Support Centers. A team of highly qualified engineers provides telephone support and will work with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz equipment.

Up-to-date information and upgrades

To keep your instrument up-to-date and to be informed about new application notes related to your instrument, please send an e-mail to the Customer Support Center stating your instrument and your wish. We will take care that you will get the right information.

Europe, Africa, Middle East

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ROHDE&SCHWARZ

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Contents

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

This manual 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 instrument 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.

These manuals can also be orderd in printed form (see ordering information in the data sheet).

Service Manual

This 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 orderd 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.

1.2 Conventions Used in the Documentation

The following conventions are used throughout this documentation:

Typographical conventions

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.
Input	Input to be entered by the user is displayed in italics.
Links	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 10.

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 DVDs

- 172 waveforms files (`*.wv`)

2.2 Version History

2.2.1 Version 1.30

- 29 new waveforms 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 waveforms files
  `IB_AMr208_e0wfc33.wv, IB_AMr208_e0wfc34.wv, IB_FMr208j_e0wfa12.wv, IB_FMr420c_e1wfr1080.wv`
- 66 updated waveforms files

Table 2-1: Updated waveforms files V1.30

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
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

Old file name	Name of replacement
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
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

2.2.2 Version 1.20

- 25 new waveforms 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 waveforms files

Table 2-2: Updated waveforms 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

2.2.3 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 2-3.

- R&S SMU200A Vector Signal Generator

- R&S SMBV100A Vector Signal Generator

- R&S SMJ100A Vector Signal Generator

- R&S AFQ100A I/Q Modulation Generator

Table 2-3: Required options

Option name	Description
• R&S SMU/SMJ-B9/B10 • R&S SMBV-B10/50/51 and -B55 • R&S AFQ-B10/B11/B12	• Baseband Generator • Baseband Generator with Memory Extension • Baseband Hardware
R&S SMx/AFQ-K352	HD RadioTM 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.

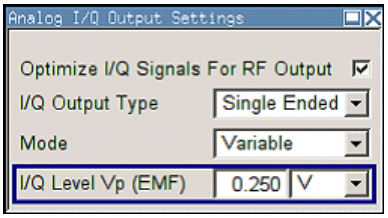
1. Copy the waveforms files from the DVDs to USB stick, external USB HDD, or use the DVD with an external USB DVD drive.
2. Connect the USB stick, USB HDD or the external USB DVD drive to USB connector of the instrument.
3. Copy the waveforms files to the instrument target directory.
4. Enable the HD 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

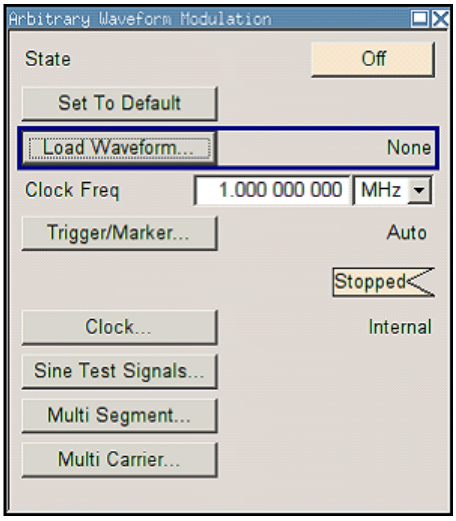
To play the HD Radio™ waveforms files on your instrument, proceed as described below.

1. Press the PRESET key.
   SCPI command: `*RST`

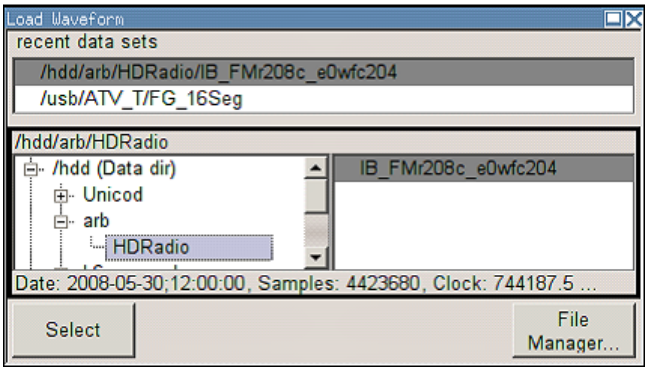
   The instrument's settings will be adjust to a standard set of operating conditions.
2. Select "AWGN/IMP > Analog I/Q Out Settings" and set the parameter "I/Q Level Vp (EMF)" to 0.25 V to meet the RF requirements for this option.



   SCPI command: `SOUR:IQ:OUTP:LEV 0.25`
3. Select "Baseband block > ARB".

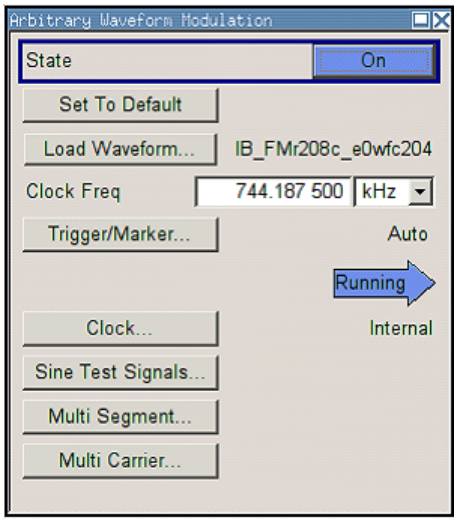


4. Select "Load Waveform" button, navigate to the directory with the HD Radio™ waveforms files (for instance `"hdd/ARB/HDRadio"`) and select a file from the list.
   Only files with extension `*.wv` are displayed.



   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.



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.

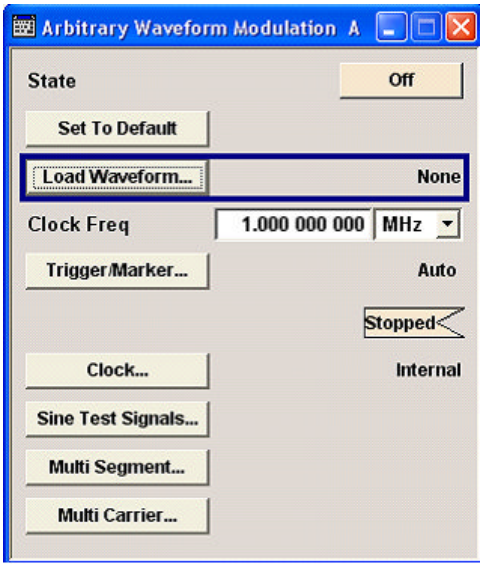
2.6 Enabling the R&S SMU/SMJ to play the HD Radio™ waveforms files

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

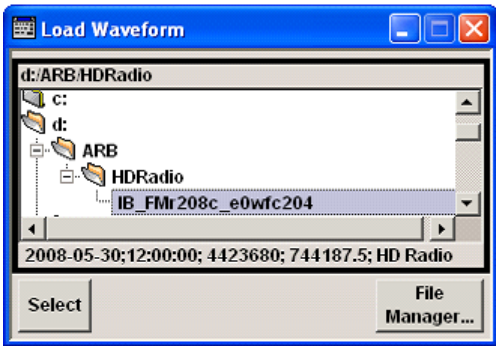
1. Press the PRESET key.
   SCPI command: `*RST`

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

2. Select "Baseband block > ARB".

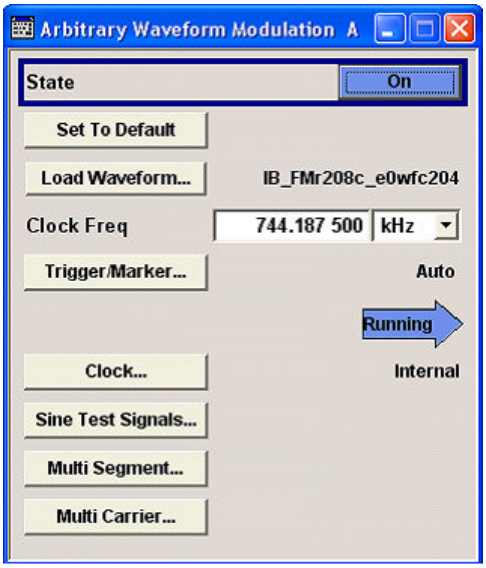


3. Select "Load Waveform" button, navigate to the directory with the HD Radio™ waveforms files (for instance `"d:/ARB/HDRadio"`) and select a file from the list.
   Only files with extension `*.wv` are displayed.



   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.



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.

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

To play the HD Radio™ waveforms files on your instrument, connect the R&S AFQ to a signal generator as shown on the figure 2-1.

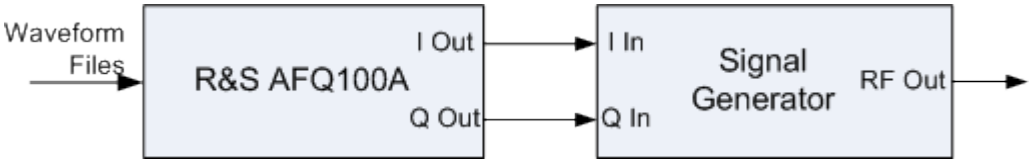


Fig. 2-1: Connecting an R&S AFQ and a signal generator

Proceed as follow:

1. Press the PRESET key.
   SCPI command: `*RST`

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

2. To overcome a possible carrier leakage interference, shift the baseband frequency bandwidth and compensate this frequency offset at the generator's side, i.e.

a) at the R&S AFQ, select "Baseband > Δt/Δf" and set the "Frequency Offset (Δf)". The recommended frequency offset is -25MHz.

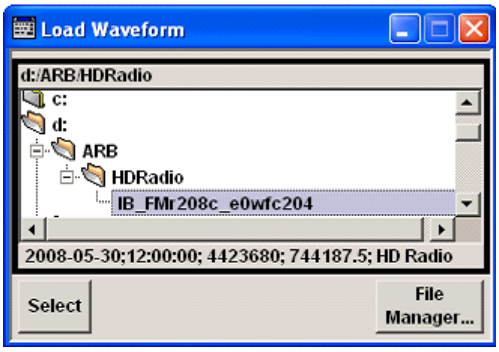
SCPI command: `SOUR:FOFF -25MHz`

b) at the signal generator, set the "RF Frequency", so that the following equation is fulfilled:
RF Frequency (output) = target Frequency - Frequency Offset

Example:

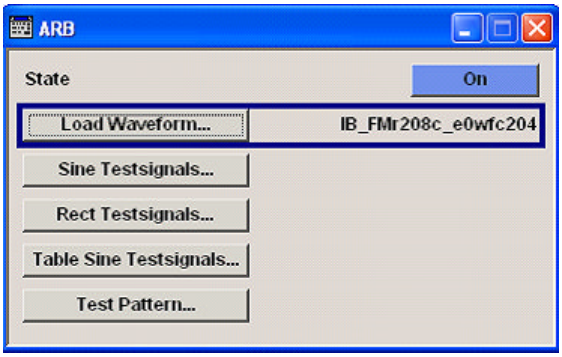
- Frequency offset = -25MHz
  - For AM frequency of 700KHz, the RF frequency has to be set to 25.7MHz.
  - For FM frequency of 95.2MHz, the RF frequency has to be set to 120.2MHz

3. Select "Baseband block > ARB".
4. 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.



5. Set the "State" to ON to enable ARB modulation.
   SCPI command: `SOUR:BB:ARB:STAT ON`

   The R&S AFQ process the selected waveform file.

3 Available Waveform Files

This chapter contains complete lists of the available waveform files, ordered by different criteria:

- File name, on page 19
- Disk number, on page 28

3.1 Waveform Files List, Ordered by File Name

Waveform file	Description	Size MB	Disk #
IB_AM_e1_awgn.wv	White Gaussian noise. Flat spectrum from -23 kHz to +23 kHz	32.4	1
IB_AM_e1a_CW_dc.wv	Unmodulated RF carrier for AM mode. Single RF carrier, frequency offset = 0 Hz	2.2	1
IB_AMr001_e1_cw_0_m10.wv	Two RF carriers $Freq_{offset1}$ = 0 Hz $Freq_{offset2}$ = -10 kHz	2.2	1
IB_AMr001_e1_cw_2_6.wv	Two RF carriers $Freq_{offset1}$ = +2 kHz $Freq_{offset2}$ = +6 kHz	2.2	1
IB_AMr001_e1_cw_m1_m2.wv	Two RF carriers $Freq_{offset1}$ = -1 kHz $Freq_{offset2}$ = -2 kHz	2.2	1
IB_AMr001_e1_cw_m30_0_30.wv	Two RF carriers $Freq_{offset1}$ = -30 kHz $Freq_{offset2}$ = 0 Hz $Freq_{offset3}$ = +30 kHz	2.2	1
IB_AMr001_e1_cw_m7p5_10.wv	Two RF carriers $Freq_{offset1}$ = -7.5 kHz $Freq_{offset2}$ = +10 kHz	2.2	1
IB_AMr201_e1awfc52.wv	MA1, Music, Blend Control Bits change from 01 to 10	34.6	1
IB_AMr208_e1awfa05.wv	MA1, Audio Mix, clean Channel, with SIS & PAD	88.6	1
IB_AMr208_e1awfa07.wv	MA3, audio mix, clean channel, with SIS & PAD	88.6	1
IB_AMr208_e1awfa10.wv	MA1, AWGN audio source, clean channel	88.6	1
IB_AMr208_e1awfb01.wv	MA3, analog source = pulsed USASI, BER pattern, clean channel	4.3	1
IB_AMr208_e1awfb02.wv	MA1, BER Pattern, GCS (triple highway over-pass, 15S under I70), field recording, 65 MPH vehicle speed	10.8	1
IB_AMr208_e1awfb03.wv	MA1, BER Pattern, GCS (double highway overpass, Alt 40W under I70), field recording, 35 MPH vehicle speed	10.8	1

Waveform file	Description	Size MB	Disk #
IB_AMr208_e1awfb04.wv	MA3, BER Pattern, GCS (double highway overpass, 27N under I70), field recording, 35 MPH vehicle speed	10.8	1
IB_AMr208_e1awfb05.wv	MA3, BER Pattern, GCS (highway overpass, sign, and power lines, I70E under Sandville Rd), field recording, 60 MPH vehicle speed	10.8	1
IB_AMr208_e1awfb102.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 65 dB-Hz	393.1	1
IB_AMr208_e1awfb104.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 67 dB-Hz	393.1	1
IB_AMr208_e1awfb111.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 74 dB-Hz	393.1	1
IB_AMr208_e1awfb113.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 76 dB-Hz	393.1	1
IB_AMr208_e1awfb119.wv	MA3 ,BER Pattern, C/No = 50 dB-Hz	393.1	1
IB_AMr208_e1awfb121.wv	MA3, BER Pattern, C/No = 52 dB-Hz	393.1	1
IB_AMr208_e1awfb124.wv	MA3, BER Pattern, C/No = 63 dB-Hz	393.1	1
IB_AMr208_e1awfb126.wv	MA3, BER Pattern, C/No = 65 dB-Hz	393.1	1
IB_AMr208_e1awfb128.wv	MA3, BER Pattern, C/No = 67 dB-Hz	393.1	1
IB_AMr208_e1awfb130.wv	MA3, BER Pattern, C/No = 61 dB-Hz	393.1	1
IB_AMr208_e1awfb131.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +17 dB	393.1	1
IB_AMr208_e1awfb132.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = -14 dB	393.1	1
IB_AMr208_e1awfb134.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = -6 dB	393.1	1
IB_AMr208_e1awfb135.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +6 dB	393.1	1
IB_AMr208_e1awfb145.wv	MA3, BER Pattern, C/No = 90 dB-Hz, hybrid lower adjacent, D/U = 0 dB	393.1	1
IB_AMr208_e1awfb243.wv	MA3, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +6 dB	393.1	1
IB_AMr208_e1awfc00.wv	alignment, clean channel	2.2	1
IB_AMr208_e1awfc04.wv	MA1, Stereo digital / mono analog, 2.5-kHz bi-level tone with calibrated analog and digital time alignment, clean channel	2.2	1
IB_AMr208_e1awfc06.wv	MA1, stereo music, clean channel	2.2	1

Waveform file	Description	Size MB	Disk #
IB_AMr208_e1awfc08.wv	MA1, Stereo digital / mono analog, 1-kHz tone with calibrated analog and digital audio levels, clean channel	2.2	1
IB_AMr208_e1awfc10.wv	MA1, 1 kHz tone (left channel only), clean channel	2.2	1
IB_AMr208_e1awfc11.wv	MA1, 1 kHz tone (right channel only), clean channel	2.2	1
IB_AMr208_e1awfc19.wv	MA1, analog audio = silence, digital audio = 1 kHz tone (right & left), clean channel	2.2	1
IB_AMr208_e1awfc20.wv	Intended for Audio Availability Testing	2.2	1
IB_AMr208_e1awfc23.wv	Analog AM only, music, clean channel	2.2	1
IB_AMr208_e1awfc24.wv	MA1, digital audio = 1kHz. Tone (Left only), analog audio = silence, C/No = 79 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208_e1awfc26.wv	Analog AM only, continuous 1kHz tone, clean channel	2.2	1
IB_AMr208_e1awfc27.wv	MA1, Stereo digital / mono analog, 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = +7 dB	2.2	1
IB_AMr208_e1awfc29.wv	MA1, digital audio = 1kHz. Tone (Left only), analog audio = silence, C/No = 76 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208_e1awfc30.wv	MA3, digital audio = 1kHz. Tone (Left only), C/No = 61 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208_e1awfc31.wv	MA3, digital audio = 1kHz. Tone (Left only), C/No = 65 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208_e1awfc32.wv	MA3, digital audio = 1kHz. Tone (Left only), C/No = 76 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208a_e1awfb00.wv	MA1, analog source = pulsed USASI, digital = BER pattern, clean channel	4.3	1
IB_AMr208a_e1awfb138.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +20 dB	393.1	1
IB_AMr208a_e1awfc33.wv	MA1, Stereo digital (left only) / mono analog, 4-kHz tone, clean channel – fixed phase discontinuity when file wraps around	2.2	1
IB_AMr208a_e1awfc34.wv	MA1, Stereo digital (right only) / mono analog, 4-kHz tone, clean channe l– fixed phase discontinuity when file wraps around	2.2	1
IB_AMr208c_e1awfa11.wv	MA1, Audio mix, AWGN. Signal alternates between the following states in this sequence: 1,2,3,2,1,2,3,2,..... 1.C/No=68dB-Hz(P1,P3 subcarriers off, ref. subcarriers on) 2.C/No=68dB-Hz (analog & digital ON) 3.C/No=90dN-Hz (analog & digital on)	393.1	1

Waveform file	Description	Size MB	Disk #
IB_AMr220_e1awfc28.wv	MA1, Stereo digital / mono analog, 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = -8 dB	2.2	1
IB_AMr230_e1awfr1005.wv	Using tagging	32.4	1
IB_AMr230a_e1awfr1001.wv	MA3, 1-kHz tone in left channel, silence in right channel	2.2	1
IB_AMr230a_e1awfr1002.wv	MA1, 1-kHz tone (left channel and right channel), AWGN such that C/No = 67 dB-Hz, Analog audio is silence	2.2	1
IB_AMr230b_e1awfc102.wv	MA1, analog 1-kHz, HD left 400 Hz, HD right 2 kHz	2.7	1
IB_AMr230d_e1awfr12.wv	MA1, audio mix, clean channel	88.6	1
IB_AMr430_e1wfr1016.wv	MA1, Secondary/tertiary subcarriers shut off; RBMI=1; Audio is 20 kbit/s mono; see Table 7-2	32.4	7
IB_AMr430_e1wfr1017.wv	MA1, Secondary/tertiary subcarriers shut off; RBMI=1; Audio is 20 kbit/s parametric stereo; see Table 7-2	32.4	7
IB_AMr430_e1wfr1018.wv	MA3, Secondary/tertiary subcarriers shut off; RBMI=1; Audio is 20 kbit/s mono; see Table 7-3	32.4	7
IB_AMr430_e1wfr1019.wv	MA3, Secondary/tertiary subcarriers shut off; RBMI=1; Audio is 20 kbit/s parametric stereo; see Table 7-3	32.4	7
IB_AMr430_e1wfr1020.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=0, PLI=0 - normal MA1 core/ enhanced; see Table 7-2	4.3	7
IB_AMr430_e1wfr1021.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=0, PLI=1 - MA1 core/ enhanced with high power secondary/tertiary; see Table 7-2	4.3	7
IB_AMr430_e1wfr1022.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=1, PLI=0 - MA1 core/ enhanced with high power PIDS; see Table 7-2	4.3	7
IB_AMr430_e1wfr1023.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=1, PLI=1 - MA1 core/ enhanced with high power secondary, tertiary, and PIDS; see Table 7-2	4.3	7
IB_AMr430_e1wfr1024.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=1, HPPI=0, PLI=0 - MA1 core only, secondary and tertiary subcarriers are shut off, high power PIDS; see Table 7-2	4.3	7

Waveform file	Description	Size MB	Disk #
IB_AMr430_e1wfr1025.wv	MA3, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=0 - normal MA3 core/ enhanced; see Table 7-3	4.3	7
IB_AMr430_e1wfr1026.wv	MA3, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=1 - MA3 core/enhanced with high power PIDS; see Table 7-3	4.3	7
IB_AMr430_e1wfr1027.wv	MA3, BER Test Pattern, contains updated definition of system control data sequence: RBMI=1, HPPI=1 - MA3 core only, secondary and tertiary subcarriers are shut off, high power PIDS; see Table 7-3	4.3	7
IB_FM_e1_awgn.wv	White Gaussian noise. Flat spectrum from -372 kHz to +372 kHz	518.4	7
IB_FM_e1_CW_dc.wv	Unmodulated RF carrier for FM mode. Single RF carrier, frequency offset = 0 Hz	34.6	7
IB_FMr001_e1_cw_0_100.wv	Two RF carriers $Freq_{offset1}$ = 0 Hz $Freq_{offset2}$ = +100 kHz	17.3	7
IB_FMr001_e1_cw_0_m100.wv	Two RF carriers $Freq_{offset1}$ = 0 Hz $Freq_{offset2}$ = -100 kHz	17.3	7
IB_FMr001_e1_cw_0_m200.wv	Two RF carriers $Freq_{offset1}$ = 0 Hz $Freq_{offset2}$ = -200 kHz	17.3	7 7
IB_FMr001_e1_cw_10_20.wv	Two RF carriers $Freq_{offset1}$ = +10 kHz $Freq_{offset2}$ = +20 kHz	17.3	7
IB_FMr001_e1_cw_50_100.wv	Two RF carriers $Freq_{offset1}$ = +50 kHz $Freq_{offset2}$ = +100 kHz	17.3	7
IB_FMr001_e1_cw_m275_0_275.wv	Two RF carriers $Freq_{offset1}$ = -275 kHz $Freq_{offset2}$ = 0 Hz $Freq_{offset3}$ = +275 kHz	17.3	7
IB_FMr001_e1_cw_m50_0.wv	Two RF carriers $Freq_{offset1}$ = -50 kHz $Freq_{offset2}$ = 0 Hz	17.3	7
IB_FMr001_e1_cw_m80_m90.wv	Two RF carriers $Freq_{offset1}$ = -80 kHz $Freq_{offset2}$ = -90 kHz	17.3	7
IB_FMr201_e1wfc52.wv	MP1, Music, Blend Control Bits change from 01 to 10	553.0	3
IB_FMr208c_e1wfa05.wv	MP1, Audio Mix, clean Channel, with SIS & PAD	518.4	2
IB_FMr208c_e1wfa25.wv	MP6, Audio Mix, clean Channel	518.4	2
IB_FMr208c_e1wfa98.wv	Analog FM only, continuous stereo 1kHz tone, clean channel	17.3	2
IB_FMr208c_e1wfa99.wv	Analog FM only, stereo music, clean channel	129.6	2

Waveform file	Description	Size MB	Disk #
IB_FMr208c_e1wfc00.wv	MP1, stereo pulsed 125-Hz tone (active 0.37 seconds, off 11.51 seconds) with calibrated analog and digital time alignment	34.6	2
IB_FMr208c_e1wfc03.wv	MP1, Stereo 4-kHz bi-level tone with calibrated analog and digital time alignment, clean channel	34.6	2
IB_FMr208c_e1wfc08.wv	MP1, Stereo 1-kHz tone with calibrated analog and digital audio levels, clean channel	17.3	2
IB_FMr208c_e1wfc09.wv	MP1, 1 kHz tone (left channel only), clean channel	17.3	2
IB_FMr208c_e1wfc10.wv	MP1, 1 kHz tone (right channel only), clean channel	17.3	2
IB_FMr208c_e1wfc201.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 54 dB-Hz	518.4	3
IB_FMr208c_e1wfc203.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 56 dB-Hz	1036.8	3
IB_FMr208c_e1wfc204.wv	MP1, analog source = audio mix, BER Pattern, clean channel	17.3	3
IB_FMr208c_e1wfc206.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 57 dB-Hz, urban fast fading	518.4	3
IB_FMr208c_e1wfc209.wv	MP1, analog source = audio mix, BER Pattern, no noise, urban fast fading	518.4	3
IB_FMr208c_e1wfc210.wv	Specific to the Portable Radio Matrix	518.4	3
IB_FMr208c_e1wfc211.wv	MP1, analog source = audio mix, BER Pattern, AWGN Channel, Cd/No = 58 dB-Hz, analog-only upper first adjacent, D/U = +6 dB	518.4	3
IB_FMr208c_e1wfc227.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 62 dB-Hz, urban fast fading, hybrid lower 1st adjacent, D/U = +6 dB	518.4	3
IB_FMr208c_e1wfc230.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 65 dB-Hz, urban fast fading, hybrid lower 1st adjacent, D/U = +6 dB	1036.8	3
IB_FMr208c_e1wfc27.wv	MP1, Stereo 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = +7 dB	17.3	2
IB_FMr208c_e1wfc28.wv	MP1, Stereo 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = -8 dB	17.3	2
IB_FMr208c_e1wfc30.wv	MP1, analog audio = silence, digital audio = 1 kHz tone (right & left), clean channel	17.3	2
IB_FMr208c_e1wfc46.wv	MP6, BER Pattern, clean channel	17.3	2
IB_FMr208c_e10wfc546.wv	MP5, BER Pattern, Cd/No = 56 dB-Hz, urban fast fading	518.4	4

Waveform file	Description	Size MB	Disk #
IB_FMr208c_e1wfc547.wv	MP5, BER Pattern, Cd/No = 57 dB-Hz, urban fast fading	1036.8	4
IB_FMr208c_e1wfc548.wv	MP5, BER Pattern, Cd/No = 59 dB-Hz, urban fast fading	1036.8	4
IB_FMr208c_e1wfc90.wv	Intended for FM Interference Performance Testing	518.4	3
IB_FMr208d_e1wfa141.wv	MP1, 3 programs; Prog 1: on P1, rate changes, 52 kbit/s / 74 kbit/s every 90 sec. Prog 4: on P1, 22 kbit/s Prog 6: on P1, 22 kbit/s for 90 seconds then off for 90 seconds	518.4	2
IB_FMr208d_e1wfc208.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 60 dB-Hz, urban fast fading	1036.8	3
IB_FMr208d_e1wfc538.wv	MP5, BER Pattern, Cd/No = 53 dB-Hz	518.4	4
IB_FMr208d_e1wfc540.wv	MP5, BER Pattern, Cd/No = 55 dB-Hz	518.4	4
IB_FMr208d_e1wfc542.wv	MP5, BER Pattern, Cd/No = 57 dB-Hz	1036.8	4
IB_FMr208d_e1wfc549.wv	MP5, BER Pattern, Cd/No = 60 dB-Hz, urban fast fading	1036.8	4
IB_FMr208e_e1wfc12.wv	MP1, 8 kHz tone (left channel only), clean channel	17.3	2
IB_FMr208e_e1wfc13.wv	MP1, 8 kHz tone (right channel only), clean channel	17.3	2
IB_FMr208g_e1wfc94.wv	MP5, digital audio = 1kHz. Tone (Left only), analog audio = silence, Cd/No = 58 dB-Hz, with SIS & PAD	518.4	3
IB_FMr208i_e1wfa58.wv	MP1, Audio Mix, AWGN, Cd/No changes from 52, 62, 52, 62, … dB-Hz, 15 seconds in each state	1036.8	2
IB_FMr208j_e1wfa105.wv	MP1, 3 programs;Prog 1: on P1, 52 kbit/s;Prog 6: on P1, 22 kbit/s;Prog 4: on P1, 22 kbit/s	518.4	2
IB_FMr208j_e1wfa106.wv	MP2, 2 programs;Prog 1: on P1, 96 kbit/s;Prog 4: on P3, 12 kbit/s	518.4	2
IB_FMr208j_e1wfa107.wv	MP2, 3 programs;Prog 1: on P1, 52 kbit/s;Prog 6: on P1, 44 kbit/s;Prog 4: on P3, 12 kbit/s	518.4	2
IB_FMr208j_e1wfa108.wv	MP3, 2 programs; Prog 1: on P1, 96 kbit/s;Prog 4: on P3, 24 kbit/s	518.4	2
IB_FMr208j_e1wfa109.wv	MP3, 3 programs;Prog 1: on P1, 52 kbit/s;Prog 6: on P1, 44 kbit/s;Prog 4: on P3, 24 kbit/s	518.4	2
IB_FMr208j_e1wfa11.wv	MP1, Audio Mix, clean Channel (same as a05 vector but different audio, SIS, and PSD), TXGain = +2 dB – fixed error in session type – changed from 01 to 00	518.4	2

Waveform file	Description	Size MB	Disk #
IB_FMr208j_e1wfc31.wv	MP1, AWGN audio source, clean channel	121.0	2
IB_FMr208j_e1wfc89.wv	MP1, digital audio = 1-kHz stereo tone, analog audio = silence, Cd/No = 58 dB-Hz, with SIS & PSD	121.0	3
IB_FMr208k_e1wfa104.wv	MP1, 2 programs;Prog 1: on P1, 65 kbit/s;Prog 4: on P1, 31 kbit/s	518.4	2
IB_FMr220a_e1wfc100.wv	MP3, 3 programs Analog: 1 kHz tone ; Prog 1: 1 kHz tone; Prog 4: 1 kHz tone; Prog 6: 1 kHz tone; (all level aligned)	17.3	3
IB_FMr220a_e1wfc101.wv	MP3, 3 programs Analog: 1 kHz tone ; Prog 1: 2 kHz tone; Prog 4: 400 Hz tone; Prog 6: 4 kHz tone	17.3	3
IB_FMr220a_e1wfc553.wv	MP5, BER Pattern, AWGN Channel, Cd/No = 55 dB-Hz, analog-only lower first adjacent, D/U = -4 dB	518.4	4
IB_FMr220a_e1wfc555.wv	MP5, BER Pattern, AWGN Channel, Cd/No = 57 dB-Hz, analog-only lower first adjacent, D/U = -4 dB	1036.8	4
IB_FMr230_e1wfc14.wv	MP3, contains reserved Service ID/Session Types in PSD, clean channel	17.3	2
IB_FMr230_e1wfr1061.wv	Music Tagging Vector (Mediabase)	518.4	5
IB_FMr230_e1wfr143.wv	MP3, 3 programs; Prog 1: on P1, 52 kbit/s Prog 4: on P3, 24 kbit/s for 90 seconds then off for 90 seconds Prog 6: on P1, 44 kbit/s	518.4	5
IB_FMr230a_e1wfa153.wv	MP11, MPS: 48 kbit/s on P1, Prog 2, 4, 6, and 8: 24 kbit/s	518.4	2
IB_FMr230a_e1wfc102.wv	MP1, analog 1-kHz, HD left 400 Hz, HD right 2 kHz, clean channel	103.7	3
IB_FMr230a_e1wfr1000.wv	MP1, used for Test 6i, ISO-8859-1 Character Set, Part 1	69.1	5
IB_FMr230a_e1wfr1001.wv	MP1, used for Test 6i, ISO-8859-1 Character Set, Part 2	69.1	5
IB_FMr230a_e1wfr1003.wv	MP1, used for Test 6i, ISO-8859-1 Character Set, Part 4	69.1	5
IB_FMr230a_e1wfr1004.wv	MP1, used for Test 6h - Maximum length PSD, Long title	69.1	5
IB_FMr230a_e1wfr1005.wv	MP1, used for Test 6h - Maximum length PSD, Long artist	69.1	5
IB_FMr230a_e1wfr1006.wv	MP1, used for Test 6h - Maximum length PSD, Long album	69.1	5
IB_FMr230a_e1wfr1007.wv	MP1, used for Test 6h - Maximum length PSD, Long genre	69.1	5
IB_FMr230a_e1wfr1008.wv	MP1, used for Test 6h - Maximum length PSD, Long comment	69.1	5

Waveform file	Description	Size MB	Disk #
IB_FMr230a_e1wfr1009.wv	MP1, used for Test 6h - Maximum length PSD, Long commercial	69.1	5
IB_FMr230a_e1wfr1011.wv	MP1, used for Test 6o-1, 2-character call sign display	69.1	5
IB_FMr230a_e1wfr1012.wv	MP1, used for Test 6o-2, No standard short call sign	69.1	5
IB_FMr230a_e1wfr1013.wv	MP1, used for Test 6o-3, No standard short call sign	69.1	5
IB_FMr230a_e1wfr1037.wv	Intended for Audio Clipping Testing	17.3	5
IB_FMr230b_e1wfr1002.wv	MP1, used for Test 6i - ISO/IEC 8859-1:1998 Character Set - Part 3, clean channel	69.1	5
IB_FMr230b_e1wfr1010.wv	MP1, used for Test 6h - Maximum length PSD, Long everything	69.1	5
IB_FMr230b_e1wfr1024.wv	Using tagging	259.2	5
IB_FMr230c_e1wfd204.wv	Demo LOT Vector	518.4	4
IB_FMr230c_e1wfr1022.wv	Using tagging	518.4	5
IB_FMr230c_e1wfr1032.wv	Intended for All Digital Max Power and All Digital Sensitivity Testing	17.3	5
IB_FMr230d_e1wfa78.wv	Demo AAS Traffic Vector	518.4	2
IB_FMr230d_e1wfr1025.wv	iTunes® Tagging Vector #4	518.4	5
IB_FMr230f_e1wfr1023.wv	Using tagging	518.4	5
IB_FMr430_e1wfr1070.wv	Conditional Access Vector #1	2073.6	5
IB_FMr430_e1wfr1071.wv	Conditional Access Vector #2	2073.6	5
IB_FMr430_e1wfr1072.wv	Conditional Access Vector #3	2073.6	6
IB_FMr430_e1wfr1073.wv	Conditional Access Vector #4	2073.6	6
IB_FMr430_e1wfr1074.wv	Conditional Access Vector #5	2073.6	6
IB_FMr430_e1wfr1075.wv	Conditional Access Vector #6	1036.8	6
IB_FMr430_e1wfr1080.wv	Traffic Vector	2073.6	7
IB_FMr430_e1wfr1082.wv	MP3, MPS, Analog: 1-kHz tone, Digital: Music; 24 kbit/s parametric stereo on P3, SPS1, Analog: Silence, Digital: Music	518.4	7
IB_FMr430_e1wfr1083.wv	MP3, MPS, Analog: 1-kHz tone, Digital: Music, Contains random data pattern; RLS data	518.4	7
IB_FMr430_e1wfr1086.wv		17.3	7
IB_FMr430_e1wfr1087.wv		17.3	7
IB_FMr430_e1wfr1088.wv		17.3	7

Waveform file	Description	Size MB	Disk #
IB_FMr430_e1wfr1089.wv		17.3	7
IB_FMr430a_e1wfr1081.wv	Electronic Program Guide (EPG) Vector. A single station EPG test vector, with a single service file and seven schedule files	553.0	7

3.2 Waveform Files List, Ordered by Disk Number

Waveform file	Description	Size MB	Disk #
IB_AM_e1_awgn.wv	White Gaussian noise. Flat spectrum from -23 kHz to +23 kHz	32.4	1
IB_AM_e1a_CW_dc.wv	Unmodulated RF carrier for AM mode. Single RF carrier, frequency offset = 0 Hz	2.2	1
IB_AMr001_e1_cw_0_m10.wv	Two RF carriers $Freq_{offset1}$ = 0 Hz $Freq_{offset2}$ = -10 kHz	2.2	1
IB_AMr001_e1_cw_2_6.wv	Two RF carriers $Freq_{offset1}$ = +2 kHz $Freq_{offset2}$ = +6 kHz	2.2	1
IB_AMr001_e1_cw_m1_m2.wv	Two RF carriers $Freq_{offset1}$ = -1 kHz $Freq_{offset2}$ = -2 kHz	2.2	1
IB_AMr001_e1_cw_m30_0_30.wv	Two RF carriers $Freq_{offset1}$ = -30 kHz $Freq_{offset2}$ = 0 Hz $Freq_{offset3}$ = +30 kHz	2.2	1
IB_AMr001_e1_cw_m7p5_10.wv	Two RF carriers $Freq_{offset1}$ = -7.5 kHz $Freq_{offset2}$ = +10 kHz	2.2	1
IB_AMr201_e1awfc52.wv	MA1, Music, Blend Control Bits change from 01 to 10	34.6	1
IB_AMr208_e1awfa05.wv	MA1, Audio Mix, clean Channel, with SIS & PAD	88.6	1
IB_AMr208_e1awfa07.wv	MA3, audio mix, clean channel, with SIS & PAD	88.6	1
IB_AMr208_e1awfa10.wv	MA1, AWGN audio source, clean channel	88.6	1
IB_AMr208_e1awfb01.wv	MA3, analog source = pulsed USASI, BER pattern, clean channel	4.3	1
IB_AMr208_e1awfb02.wv	MA1, BER Pattern, GCS (triple highway overpass, 15S under I70), field recording, 65 MPH vehicle speed	10.8	1
IB_AMr208_e1awfb03.wv	MA1, BER Pattern, GCS (double highway overpass, Alt 40W under I70), field recording, 35 MPH vehicle speed	10.8	1
IB_AMr208_e1awfb04.wv	MA3, BER Pattern, GCS (double highway overpass, 27N under I70), field recording, 35 MPH vehicle speed	10.8	1

Waveform file	Description	Size MB	Disk #
IB_AMr208_e1awfb05.wv	MA3, BER Pattern, GCS (highway overpass, sign, and power lines, I70E under Sandville Rd), field recording, 60 MPH vehicle speed	10.8	1
IB_AMr208_e1awfb102.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 65 dB-Hz	393.1	1
IB_AMr208_e1awfb104.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 67 dB-Hz	393.1	1
IB_AMr208_e1awfb111.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 74 dB-Hz	393.1	1
IB_AMr208_e1awfb113.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 76 dB-Hz	393.1	1
IB_AMr208_e1awfb119.wv	MA3 ,BER Pattern, C/No = 50 dB-Hz	393.1	1
IB_AMr208_e1awfb121.wv	MA3, BER Pattern, C/No = 52 dB-Hz	393.1	1
IB_AMr208_e1awfb124.wv	MA3, BER Pattern, C/No = 63 dB-Hz	393.1	1
IB_AMr208_e1awfb126.wv	MA3, BER Pattern, C/No = 65 dB-Hz	393.1	1
IB_AMr208_e1awfb128.wv	MA3, BER Pattern, C/No = 67 dB-Hz	393.1	1
IB_AMr208_e1awfb130.wv	MA3, BER Pattern, C/No = 61 dB-Hz	393.1	1
IB_AMr208_e1awfb131.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +17 dB	393.1	1
IB_AMr208_e1awfb132.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = -14 dB	393.1	1
IB_AMr208_e1awfb134.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = -6 dB	393.1	1
IB_AMr208_e1awfb135.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +6 dB	393.1	1
IB_AMr208_e1awfb145.wv	MA3, BER Pattern, C/No = 90 dB-Hz, hybrid lower adjacent, D/U = 0 dB	393.1	1
IB_AMr208_e1awfb243.wv	MA3, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +6 dB	393.1	1
IB_AMr208_e1awfc00.wv	alignment, clean channel	2.2	1
IB_AMr208_e1awfc04.wv	MA1, Stereo digital / mono analog, 2.5-kHz bi-level tone with calibrated analog and digital time alignment, clean channel	2.2	1
IB_AMr208_e1awfc06.wv	MA1, stereo music, clean channel	2.2	1
IB_AMr208_e1awfc08.wv	MA1, Stereo digital / mono analog, 1-kHz tone with calibrated analog and digital audio levels, clean channel	2.2	1

Waveform file	Description	Size MB	Disk #
IB_AMr208_e1awfc10.wv	MA1, 1 kHz tone (left channel only), clean channel	2.2	1
IB_AMr208_e1awfc11.wv	MA1, 1 kHz tone (right channel only), clean channel	2.2	1
IB_AMr208_e1awfc19.wv	MA1, analog audio = silence, digital audio = 1 kHz tone (right & left), clean channel	2.2	1
IB_AMr208_e1awfc20.wv	Intended for Audio Availability Testing	2.2	1
IB_AMr208_e1awfc23.wv	Analog AM only, music, clean channel	2.2	1
IB_AMr208_e1awfc24.wv	MA1, digital audio = 1kHz. Tone (Left only), analog audio = silence, C/No = 79 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208_e1awfc26.wv	Analog AM only, continuous 1kHz tone, clean channel	2.2	1
IB_AMr208_e1awfc27.wv	MA1, Stereo digital / mono analog, 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = +7 dB	2.2	1
IB_AMr208_e1awfc29.wv	MA1, digital audio = 1kHz. Tone (Left only), analog audio = silence, C/No = 76 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208_e1awfc30.wv	MA3, digital audio = 1kHz. Tone (Left only), C/No = 61 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208_e1awfc31.wv	MA3, digital audio = 1kHz. Tone (Left only), C/No = 65 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208_e1awfc32.wv	MA3, digital audio = 1kHz. Tone (Left only), C/No = 76 dB-Hz, with SIS & PAD	2.2	1
IB_AMr208a_e1awfb00.wv	MA1, analog source = pulsed USASI, digital = BER pattern, clean channel	4.3	1
IB_AMr208a_e1awfb138.wv	MA1, analog source = pulsed USASI, BER Pattern, C/No = 90 dB-Hz, hybrid upper adjacent, D/U = +20 dB	393.1	1
IB_AMr208a_e1awfc33.wv	MA1, Stereo digital (left only) / mono analog, 4-kHz tone, clean channel – fixed phase discontinuity when file wraps around	2.2	1
IB_AMr208a_e1awfc34.wv	MA1, Stereo digital (right only) / mono analog, 4-kHz tone, clean channe l– fixed phase discontinuity when file wraps around	2.2	1
IB_AMr208c_e1awfa11.wv	MA1 Audio mix, AWGN. Signal alternates between the following states in this sequence: 1,2,3,2,1,2,3,2,..... 1.C/No=68dB-Hz(P1,P3 subcarriers off, ref. subcarriers on) 2.C/No=68dB-Hz (analog & digital ON) 3.C/No=90dN-Hz (analog & digital on)	393.1	1

Waveform file	Description	Size MB	Disk #
IB_AMr220_e1awfc28.wv	MA1, Stereo digital / mono analog, 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = -8 dB	2.2	1
IB_AMr230_e1awfr1005.wv	Using tagging	32.4	1
IB_AMr230a_e1awfr1001.wv	MA3, 1-kHz tone in left channel, silence in right channel	2.2	1
IB_AMr230a_e1awfr1002.wv	MA1, 1-kHz tone in left channel and right channel, AWGN such that C/No = 67 dB-Hz, Analog audio is silence	2.2	1
IB_AMr230b_e1awfc102.wv	MA1, analog 1-kHz, HD left 400 Hz, HD right 2 kHz	2.7	1
IB_AMr230d_e1awfr12.wv	MA1, audio mix, clean channel	88.6	1
IB_FMr208c_e1wfa05.wv	MP1, Audio Mix, clean Channel, with SIS and PAD	518.4	2
IB_FMr208c_e1wfa25.wv	MP6, Audio Mix, clean Channel	518.4	2
IB_FMr208c_e1wfa98.wv	Analog FM only, continuous stereo 1kHz tone, clean channel	17.3	2
IB_FMr208c_e1wfa99.wv	Analog FM only, stereo music, clean channel	129.6	2
IB_FMr208c_e1wfc00.wv	MP1, stereo pulsed 125-Hz tone (active 0.37 seconds, off 11.51 seconds) with calibrated analog and digital time alignment	34.6	2
IB_FMr208c_e1wfc03.wv	MP1, Stereo 4-kHz bi-level tone with calibrated analog and digital time alignment, clean channel	34.6	2
IB_FMr208c_e1wfc08.wv	MP1, Stereo 1-kHz tone with calibrated analog and digital audio levels, clean channel	17.3	2
IB_FMr208c_e1wfc09.wv	MP1, 1 kHz tone (left channel only), clean channel	17.3	2
IB_FMr208c_e1wfc10.wv	MP1, 1 kHz tone (right channel only), clean channel	17.3	2
IB_FMr208c_e1wfc27.wv	MP1, Stereo 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = +7 dB	17.3	2
IB_FMr208c_e1wfc28.wv	MP1, Stereo 1-kHz tone with calibrated analog and digital audio levels, clean channel, TXGain = -8 dB	17.3	2
IB_FMr208c_e1wfc30.wv	MP1, analog audio = silence, digital audio = 1 kHz tone (right & left), clean channel	17.3	2
IB_FMr208c_e1wfc46.wv	MP6, BER Pattern, clean channel	17.3	2
IB_FMr208d_e1wfa141.wv	MP1, 3 programs Prog 1: on P1, rate changes, 52 kbit/s / 74 kbit/s every 90 sec.Prog 4: on P1, 22 kbit/s Prog 6: on P1, 22 kbit/s for 90 seconds then off for 90 seconds	518.4	2

Waveform file	Description	Size MB	Disk #
IB_FMr208e_e1wfc12.wv	MP1, 8 kHz tone (left channel only), clean channel	17.3	2
IB_FMr208e_e1wfc13.wv	MP1, 8 kHz tone (right channel only), clean channel	17.3	2
IB_FMr208i_e1wfa58.wv	MP1, Audio Mix, AWGN, Cd/No changes from 52, 62, 52, 62, … dB-Hz, 15 seconds in each state	1036.8	2
IB_FMr208j_e1wfa105.wv	MP1, 3 programs;Prog 1: on P1, 52 kbit/s;Prog 6: on P1, 22 kbit/s;Prog 4: on P1, 22 kbit/s	518.4	2
IB_FMr208j_e1wfa106.wv	MP2, 2 programs;Prog 1: on P1, 96 kbit/s;Prog 4: on P3, 12 kbit/s	518.4	2
IB_FMr208j_e1wfa107.wv	MP2, 3 programs;Prog 1: on P1, 52 kbit/s;Prog 6: on P1, 44 kbit/s;Prog 4: on P3, 12 kbit/s	518.4	2
IB_FMr208j_e1wfa108.wv	MP3, 2 programs; Prog 1: on P1, 96 kbit/s;Prog 4: on P3, 24 kbit/s	518.4	2
IB_FMr208j_e1wfa109.wv	MP3, 3 programs;Prog 1: on P1, 52 kbit/s;Prog 6: on P1, 44 kbit/s;Prog 4: on P3, 24 kbit/s	518.4	2
IB_FMr208j_e1wfa11.wv	MP1, Audio Mix, clean Channel (same as a05 vector but different audio, SIS, and PSD), TXGain = +2 dB – fixed error in session type – changed from 01 to 00	518.4	2
IB_FMr208j_e1wfc31.wv	MP1, AWGN audio source, clean channel	121.0	2
IB_FMr208k_e1wfa104.wv	MP1, 2 programs;Prog 1: on P1, 65 kbit/s;Prog 4: on P1, 31 kbit/s	518.4	2
IB_FMr230_e1wfc14.wv	MP3, contains reserved Service ID/Session Types in PSD, clean channel	17.3	2
IB_FMr230a_e1wfa153.wv	MP11, MPS: 48 kbit/s on P1, Prog 2, 4, 6, and 8: 24 kbit/s	518.4	2
IB_FMr230d_e1wfa78.wv	Demo AAS Traffic Vector	518.4	2
IB_FMr201_e1wfc52.wv	MP1, Music, Blend Control Bits change from 01 to 10	553.0	3
IB_FMr208c_e1wfc201.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 54 dB-Hz	518.4	3
IB_FMr208c_e1wfc203.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 56 dB-Hz	1036.8	3
IB_FMr208c_e1wfc204.wv	MP1, analog source = audio mix, BER Pattern, clean channel	17.3	3
IB_FMr208c_e1wfc206.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 57 dB-Hz, urban fast fading	518.4	3
IB_FMr208c_e1wfc209.wv	MP1, analog source = audio mix, BER Pattern, no noise, urban fast fading	518.4	3
IB_FMr208c_e1wfc210.wv	Specific to the Portable Radio Matrix	518.4	3

Waveform file	Description	Size MB	Disk #
IB_FMr208c_e1wfc211.wv	MP1, analog source = audio mix, BER Pattern, AWGN Channel, Cd/No = 58 dB-Hz, analog-only upper first adjacent, D/U = +6 dB	518.4	3
IB_FMr208c_e1wfc227.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 62 dB-Hz, urban fast fading, hybrid lower 1st adjacent, D/U = +6 dB	518.4	3
IB_FMr208c_e1wfc230.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 65 dB-Hz, urban fast fading, hybrid lower 1st adjacent, D/U = +6 dB	1036.8	3
IB_FMr208c_e1wfc90.wv	Intended for FM Interference Performance Testing	518.4	3
IB_FMr208d_e1wfc208.wv	MP1, analog source = audio mix, BER Pattern, Cd/No = 60 dB-Hz, urban fast fading	1036.8	3
IB_FMr208g_e1wfc94.wv	MP5, digital audio = 1kHz. Tone (Left only), analog audio = silence, Cd/No = 58 dB-Hz, with SIS & PAD	518.4	3
IB_FMr208j_e1wfc89.wv	MP1, digital audio = 1-kHz stereo tone, analog audio = silence, Cd/No = 58 dB-Hz, with SIS & PSD	121.0	3
IB_FMr220a_e1wfc100.wv	MP3, 3 programs Analog: 1 kHz tone ; Prog 1: 1 kHz tone; Prog 4: 1 kHz tone; Prog 6: 1 kHz tone; (all level aligned)	17.3	3
IB_FMr220a_e1wfc101.wv	MP3, 3 programs Analog: 1 kHz tone ; Prog 1: 2 kHz tone; Prog 4: 400 Hz tone; Prog 6: 4 kHz tone	17.3	3
IB_FMr230a_e1wfc102.wv	MP1, analog 1-kHz, HD left 400 Hz, HD right 2 kHz, clean channel	103.7	3
IB_FMr208c_e1wfc546.wv	MP5, BER Pattern, Cd/No = 56 dB-Hz, urban fast fading	518.4	4
IB_FMr208c_e1wfc547.wv	MP5, BER Pattern, Cd/No = 57 dB-Hz, urban fast fading	1036.8	4
IB_FMr208c_e1wfc548.wv	MP5, BER Pattern, Cd/No = 59 dB-Hz, urban fast fading	1036.8	4
IB_FMr208d_e1wfc538.wv	MP5, BER Pattern, Cd/No = 53 dB-Hz	518.4	4
IB_FMr208d_e1wfc540.wv	MP5, BER Pattern, Cd/No = 55 dB-Hz	518.4	4
IB_FMr208d_e1wfc542.wv	MP5, BER Pattern, Cd/No = 57 dB-Hz	1036.8	4
IB_FMr208d_e1wfc549.wv	MP5, BER Pattern, Cd/No = 60 dB-Hz, urban fast fading	1036.8	4
IB_FMr220a_e1wfc553.wv	MP5, BER Pattern, AWGN Channel, Cd/No = 55 dB-Hz, analog-only lower first adjacent, D/U = -4 dB	518.4	4
IB_FMr220a_e1wfc555.wv	MP5, BER Pattern, AWGN Channel, Cd/No = 57 dB-Hz, analog-only lower first adjacent, D/U = -4 dB	1036.8	4

Waveform file	Description	Size MB	Disk #
IB_FMr230c_e1wfd204.wv	Demo LOT Vector	518.4	4
IB_FMr230_e1wfr1061.wv	Music Tagging Vector (Mediabase)	518.4	5
IB_FMr230_e1wfr143.wv	MP3, 3 programs; Prog 1: on P1, 52 kbit/s Prog 4: on P3, 24 kbit/s for 90 seconds then off for 90 seconds Prog 6: on P1, 44 kbit/s	518.4	5
IB_FMr230a_e1wfr1000.wv	MP1, used for Test 6i, ISO-8859-1 Character Set, Part 1	69.1	5
IB_FMr230a_e1wfr1001.wv	MP1, used for Test 6i, ISO-8859-1 Character Set, Part 2	69.1	5
IB_FMr230a_e1wfr1003.wv	MP1, used for Test 6i, ISO-8859-1 Character Set, Part 4	69.1	5
IB_FMr230a_e1wfr1004.wv	MP1, used for Test 6h - Maximum length PSD, Long title	69.1	5
IB_FMr230a_e1wfr1005.wv	MP1, used for Test 6h - Maximum length PSD, Long artist	69.1	5
IB_FMr230a_e1wfr1006.wv	MP1, used for Test 6h - Maximum length PSD, Long album	69.1	5
IB_FMr230a_e1wfr1007.wv	MP1, used for Test 6h - Maximum length PSD, Long genre	69.1	5
IB_FMr230a_e1wfr1008.wv	MP1, used for Test 6h - Maximum length PSD, Long comment	69.1	5
IB_FMr230a_e1wfr1009.wv	MP1, used for Test 6h - Maximum length PSD, Long commercial	69.1	5
IB_FMr230a_e1wfr1011.wv	MP1, used for Test 6o-1, 2-character call sign display	69.1	5
IB_FMr230a_e1wfr1012.wv	MP1, used for Test 6o-2, No standard short call sign	69.1	5
IB_FMr230a_e1wfr1013.wv	MP1, used for Test 6o-3, No standard short call sign	69.1	5
IB_FMr230a_e1wfr1037.wv	Intended for Audio Clipping Testing	17.3	5
IB_FMr230b_e1wfr1002.wv	MP1, used for Test 6i - ISO/IEC 8859-1:1998 Character Set - Part 3, clean channel	69.1	5
IB_FMr230b_e1wfr1010.wv	MP1, used for Test 6h - Maximum length PSD, Long everything	69.1	5
IB_FMr230b_e1wfr1024.wv	Using tagging	259.2	5
IB_FMr230c_e1wfr1022.wv	Using tagging	518.4	5
IB_FMr230c_e1wfr1032.wv	Intended for All Digital Max Power and All Digital Sensitivity Testing	17.3	5
IB_FMr230d_e1wfr1025.wv	iTunes® Tagging Vector #4	518.4	5
IB_FMr230f_e1wfr1023.wv	Using tagging	518.4	5

Waveform file	Description	Size MB	Disk #
IB_FMr430_e1wfr1070.wv	Conditional Access Vector #1	2073.6	5
IB_FMr430_e1wfr1071.wv	Conditional Access Vector #2	2073.6	5
IB_FMr430_e1wfr1072.wv	Conditional Access Vector #3	2073.6	6
IB_FMr430_e1wfr1073.wv	Conditional Access Vector #4	2073.6	6
IB_FMr430_e1wfr1074.wv	Conditional Access Vector #5	2073.6	6
IB_FMr430_e1wfr1075.wv	Conditional Access Vector #6	1036.8	6
IB_AMr430_e1wfr1016.wv	MA1, Secondary/tertiary subcarriers shut off; RBMI=1; Audio is 20 kbit/s mono; see Table 7-2	32.4	7
IB_AMr430_e1wfr1017.wv	MA1, Secondary/tertiary subcarriers shut off; RBMI=1; Audio is 20 kbit/s parametric stereo; see Table 7-2	32.4	7
IB_AMr430_e1wfr1018.wv	MA3, Secondary/tertiary subcarriers shut off; RBMI=1; Audio is 20 kbit/s mono; see Table 7-3	32.4	7
IB_AMr430_e1wfr1019.wv	MA3, Secondary/tertiary subcarriers shut off; RBMI=1; Audio is 20 kbit/s parametric stereo; see Table 7-3	32.4	7
IB_AMr430_e1wfr1020.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=0, PLI=0 - normal MA1 core/enhanced; see Table 7-2	4.3	7
IB_AMr430_e1wfr1021.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=0, PLI=1 - MA1 core/enhanced with high power secondary/tertiary; see Table 7-2	4.3	7
IB_AMr430_e1wfr1022.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=1, PLI=0 - MA1 core/enhanced with high power PIDS; see Table 7-2	4.3	7
IB_AMr430_e1wfr1023.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=1, PLI=1 - MA1 core/enhanced with high power secondary, tertiary, and PIDS; see Table 7-2	4.3	7
IB_AMr430_e1wfr1024.wv	MA1, BER Test Pattern, contains updated definition of system control data sequence: RBMI=1, HPPI=0, PLI=0 - MA1 core only, secondary and tertiary subcarriers are shut off, high power PIDS; see Table 7-2	4.3	7
IB_AMr430_e1wfr1025.wv	MA3, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=0 - normal MA3 core/enhanced; see Table 7-3	4.3	7

Waveform file	Description	Size MB	Disk #
IB_AMr430_e1wfr1026.wv	MA3, BER Test Pattern, contains updated definition of system control data sequence: RBMI=0, HPPI=1 - MA3 core/enhanced with high power PIDS; see Table 7-3	4.3	7
IB_AMr430_e1wfr1027.wv	MA3, BER Test Pattern, contains updated definition of system control data sequence: RBMI=1, HPPI=1 - MA3 core only, secondary and tertiary subcarriers are shut off, high power PIDS; see Table 7-3	4.3	7
IB_FM_e1_awgn.wv	White Gaussian noise. Flat spectrum from -372 kHz to +372 kHz	518.4	7
IB_FM_e1_CW_dc.wv	Unmodulated RF carrier for FM mode. Single RF carrier, frequency offset = 0 Hz	34.6	7
IB_FMr001_e1_cw_0_100.wv	Two RF carriers $Freq_{offset1}$ = 0 Hz $Freq_{offset2}$ = +100 kHz	17.3	7
IB_FMr001_e1_cw_0_m100.wv	Two RF carriers $Freq_{offset1}$ = 0 Hz $Freq_{offset2}$ = -100 kHz	17.3	7
IB_FMr001_e1_cw_0_m200.wv	Two RF carriers $Freq_{offset1}$ = 0 Hz $Freq_{offset2}$ = -200 kHz	17.3	7
IB_FMr001_e1_cw_10_20.wv	Two RF carriers $Freq_{offset1}$ = +10 kHz $Freq_{offset2}$ = +20 kHz	17.3	7
IB_FMr001_e1_cw_50_100.wv	Two RF carriers $Freq_{offset1}$ = +50 kHz $Freq_{offset2}$ = +100 kHz	17.3	7
IB_FMr001_e1_cw_m275_0_275.wv	Two RF carriers $Freq_{offset1}$ = -275 kHz $Freq_{offset2}$ = 0 Hz $Freq_{offset3}$ = +275 kHz	17.3	7
IB_FMr001_e1_cw_m50_0.wv	Two RF carriers $Freq_{offset1}$ = -50 kHz $Freq_{offset2}$ = 0 Hz	17.3	7
IB_FMr001_e1_cw_m80_m90.wv	Two RF carriers $Freq_{offset1}$ = -80 kHz $Freq_{offset2}$ = -90 kHz	17.3	7
IB_FMr430_e1wfr1080.wv	Traffic Vector	2073.6	7
IB_FMr430_e1wfr1082.wv	MP3, MPS, Analog: 1-kHz tone, Digital: Music; 24 kbit/s parametric stereo on P3, SPS1, Analog: Silence, Digital: Music	518.4	7
IB_FMr430_e1wfr1083.wv	MP3, MPS, Analog: 1-kHz tone, Digital: Music, Contains random data pattern; RLS data	518.4	7
IB_FMr430_e1wfr1086.wv		17.3	7
IB_FMr430_e1wfr1087.wv		17.3	7
IB_FMr430_e1wfr1088.wv		17.3	7
IB_FMr430_e1wfr1089.wv		17.3	7
IB_FMr430a_e1wfr1081.wv	Electronic Program Guide (EPG) Vector, A single station EPG test vector, with a single service file and seven schedule files	553.0	7

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