

R&S[®] SMU-K353, R&S[®] SMJ-K353, R&S[®] SMBV-K353 DAB+ Streams

Manual



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The Manual describes the content of the DAB+ Streams DVD:

R&S[®]SMU-K353 1408.8652.02
R&S[®]SMJ-K353 1409.3525.02
R&S[®]SMBV-K353 1415.8702.02

© 2012 Rohde & Schwarz GmbH & Co. KG
Muehldorfstr. 15, 81671 Munich, Germany
Phone: +49 89 41 29 - 0
Fax: +49 89 41 29 12 164
E-mail: info@rohde-schwarz.com
Internet: <http://www.rohde-schwarz.com>

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The following abbreviations are used throughout this manual:
R&S[®]SMU is abbreviated as R&S SMU, R&S[®]SMJ is abbreviated as R&S SMJ, R&S[®]SMBV is abbreviated as R&S SMBV

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 $\pm 10\%$ shall apply to the nominal voltage and $\pm 5\%$ 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 $V_{\text{rms}} > 30 \text{ V}$, 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.

Basic Safety Instructions

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.







Informaciones elementales de seguridad

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	Advertencia: 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 $\pm 10\%$ sobre el voltaje nominal y de $\pm 5\%$ 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 $U_{\text{eff}} > 30 \text{ V}$ 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 señalar 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.

Informaciones elementales de seguridad

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 ISO9001 und ISO14001 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 ISO9001 and ISO14001.

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 ISO9001 et ISO14001.

Engagement écologique

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

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

Phone +49 89 4129 12345
customersupport@rohde-schwarz.com

North America

Phone 1-888-TEST-RSA (1-888-837-8772)
customer.support@rsa.rohde-schwarz.com

Latin America

Phone +1-410-910-7988
customersupport.la@rohde-schwarz.com

Asia/Pacific

Phone +65 65 13 04 88
customersupport.asia@rohde-schwarz.com

China

Phone +86-800-810-8228 /
+86-400-650-5896
customersupport.china@rohde-schwarz.com



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1 Getting Started

This DVD contains transport stream files (*.DABP_C) to be played on the DAB/T-DMB Option of the instruments listed under "[System Requirements](#)" on page **Error!**
Bookmark not defined..

1.1 Contents of the DVD

- This document
- 6 transport stream files (*.DABP_C)

1.2 Version History



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

1.2.1 Version 1.20

Initial release.

1.3 System Requirements

The stream library can be used on the instruments listed below. The instrument must be equipped with the options listed in [Table 1-1](#).

Table 1-1: Required options

Option name	
R&S SMx-K53	DAB/T-DMB

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.

Supported Instruments:

- R&S SMU Vector Signal Generator
- R&S SMJ Vector Signal Generator
- R&S SMBV Vector Signal Generator

1.4 Installation Instructions



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

If the transport stream files are supplied together with a new instrument, the license key are already installed. To install the license key on your instrument, proceed as described in the “Installation Instructions for Options” included in the delivery.

To install the transport stream files on your instrument, proceed as described below.

1. Copy the transport stream files from the DVD 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 transport stream files to the instrument target directory, e.g. `transfer`.
4. Alternatively, store the files to a network drive and connect the instrument to the LAN.

Enabling the Instrument to Play the DAB+ Transport Stream Files

5. Enable the instrument to play the encrypted files (see [Enabling the Instrument to Play the DAB+ Transport Stream Files](#)).

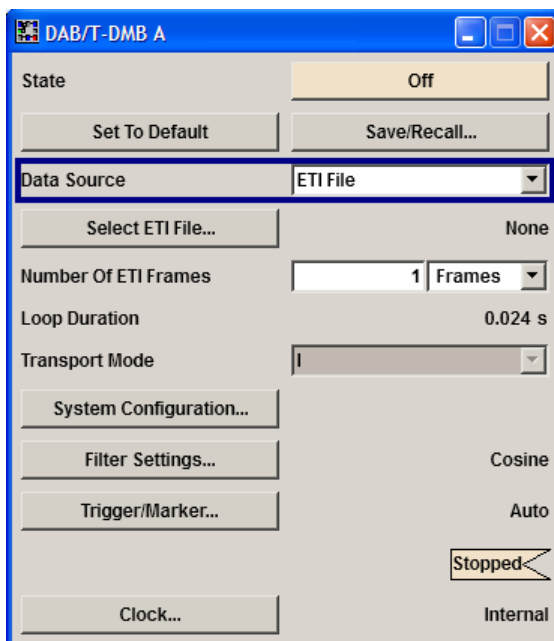
1.5 Enabling the Instrument to Play the DAB+ Transport Stream Files

To play the DAB+ stream files on your instrument, proceed as described below.

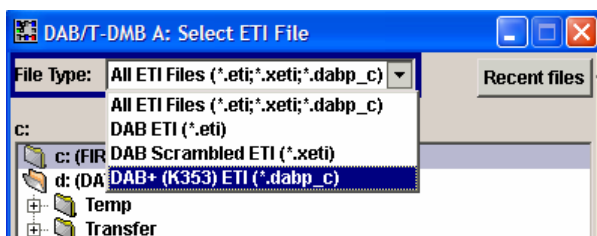
1. Press the PRESET key.

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

2. Select “Baseband > DAB/T-DMB > Data Source > ETI File”



3. Select “Select ETI File”, navigate to the directory with the DAB+ stream files and select a file from the list.



Only files with extension **.dabp_c* are displayed.

Set “DAB/T-DMB > State > ON” to enable signal generation.

2 Available Stream Files

This chapter contains a description of the available stream files.

- [DAB+ Audio Variety \(eti1_file.dabp_c\)](#)
- [DAB DAB+ Audio Mix \(eti2_file.dabp_c\)](#)
- [DAB+ Audio Changes \(eti3_file.dabp_c\)](#)
- [DAB+ CISPR13/14 \(eti4_file.dabp_c\)](#)
- [DATA Services \(eti5_file.dabp_c\)](#)

2.1 DAB+ Audio Variety (eti1_file.dabp_c)

2.1.1 Purpose

This ETI file contains several DAB+ audio streams and program services that use these audio streams. Different protection levels (all EEP A) are used. DAB+ audio is used as primary service component or as a secondary audio service component. Some streams use MPEG surround. One stream uses PAD.

Therefore this tests permits to determine if:

- The decoder is able to process DAB+ at different bit rates / protection levels
- The decoder is able to correctly evaluate and present DAB services with DAB+ being primary and/or secondary audio service component
- MPEG surround is supported
- X-PAD data can be extracted from a DAB+ stream



ETI file "Data service" also provides a data service with DAB+ audio as a secondary service component.

2.1.2 General Ensemble Information

Ensemble label	'DAB+·variety' (abbreviated label: 'DAB+·var'; flag field 0xff00; character set EBU basic core)
Ensemble identifier	0xdab1
Transmission mode	1
Ensemble country	Germany (D) (ecc and country code: e0d)
International table for PTy codes	All countries, except for North America
Ensemble time zone	Europe/Berlin
DAB time format (FIG0/10)	Long-form version

2.1.3 Service Information

Table 2-1: Service 1 ('192kbps PL1 Surr')

Service label	'192kbps-PL1·Surr' (abbreviated label: '192PL1·S'; flag field 0xe0f8; character set EBU basic core)
Service identifier	0xd07b (audio service)
Program type (PTy)	Information (PTy code 3; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Speech (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 1
SCIdS	0 (automatically assigned)

Table 2-2: Service 2 ('192kbps PL3 Ster')

Service label	'192kbps-PL3-Ster' (abbreviated label: '192PL3-'; flag field 0xe0e0; character set EBU basic core)
Service identifier	0xd07c (audio service)
Program type (PTy)	Leisure (PTy code 23; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Park scene (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 2
SCIdS	0 (automatically assigned)

Table 2-3: Service 3 ('160kbps PL3 Ster')

Service label	'160kbps-PL3-Ster' (abbreviated label: '160PL3-'; flag field 0xe0e0; character set EBU basic core)
Service identifier	0xd07d (audio service)
Program type (PTy)	Serious Classical (PTy code 14; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Bach (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 3
SCIdS	0 (automatically assigned)

Table 2-4: Service 4 ('128kbps PL3 Surr')

Service label	'128kbps·PL3·Surr' (abbreviated label: '128PL3·S'; flag field 0xe0f8; character set EBU basic core)
Service identifier	0xd07e (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Frequency sweep (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 4
SCIdS	0 (automatically assigned)

Table 2-5: Service 5 ('96kbps PL4 Surr')

Service label	'96kbps·PL4·Surr' (abbreviated label: '96PL4·S'; flag field 0xe0f8; character set EBU basic core)
Service identifier	0xd07f (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Different sines on each channel (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 5
SCIdS	0 (automatically assigned)

Table 2-6: Service 6 ('96kbps PL3 Mono')

Service label	'96kbps·PL3·Mono' (abbreviated label: '96PL3·M'; flag field 0xe0f8; character set EBU basic core)
Service identifier	0xd080 (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	16 tone (mono) (audio: live source or play list)
Service component carried in	Stream 6
SCIdS	0 (automatically assigned)
PAD data	SLS PAD1 (Application: MOT Slideshow) DLS PAD1 (Application: Dynamic labels) Journaline PAD1 (Application: Journaline(R))

Table 2-7: Service 7 ('48kbps PL4 Ster')

Service label	'48kbps·PL4·Ster' (abbreviated label: '48PL4·'; flag field 0xe0e0; character set EBU basic core)
Service identifier	0xd081 (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Sine 10 kHz (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 7
SCIdS	0 (automatically assigned)

Table 2-8: Service 8 ('Secondary SCs')

Service label	'Secondary·SCs' (abbreviated label: 'Secondar'; flag field 0xff00; character set EBU basic core)
Service identifier	0xd082 (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Speech (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 1
SCIdS	0 (automatically assigned)
Service component label	'192kbps·PL1·Surr' (abbreviated label: '192PL1·S'; flag field 0xe0f8; character set EBU basic core)
Secondary service component 1	Park scene (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 2
SCIdS	1 (automatically assigned)
Service component label	'192kbps·PL3·Ster' (abbreviated label: '192PL3·'; flag field 0xe0e0; character set EBU basic core)
Secondary service component 2	Bach (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 3
SCIdS	2 (automatically assigned)
Service component label	'160kbps·PL3·Ster' (abbreviated label: '160PL3·'; flag field 0xe0e0; character set EBU basic core)

DAB+ Audio Variety (eti1_file.dabp_c)

Secondary service component 3	Frequency sweep (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 4
SCIdS	3 (automatically assigned)
Service component label	'128kbps-PL3-Surr' (abbreviated label: '128PL3-S'; flag field 0xe0f8; character set EBU basic core)
Secondary service component 4	Different sines on each channel (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 5
SCIdS	4 (automatically assigned)
Service component label	'96kbps-PL4-Surr' (abbreviated label: '96PL4-S'; flag field 0xe0f8; character set EBU basic core)
Secondary service component 5	16 tone (mono) (audio: live source or play list)
Service component carried in	Stream 6
SCIdS	5 (automatically assigned)
PAD data	SLS PAD1 (Application: MOT Slideshow) DLS PAD1 (Application: Dynamic labels) Journaline PAD1 (Application: Journaline(R))
Service component label	'96kbps-PL3-Mono' (abbreviated label: '96PL3-M'; flag field 0xe0f8; character set EBU basic core)
Secondary service component 6	Sine 10 kHz (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 7
SCIdS	6 (automatically assigned)
Service component label	'48kbps-PL4-Ster' (abbreviated label: '48PL4-'; flag field 0xe0e0; character set EBU basic core)

2.1.4 Stream Information

Table 2-9: Stream 1

Subchannel mode	audio
Bit rate	192 kbps (288 CUs)
Protection level	EEP 1-A
Subchannel identifier	2 (automatically assigned)
Service component	Speech (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '192kbps PL1 Surr' (primary service component) Audio (program) service 'Secondary SCs ' (primary service component '192kbps PL1 Surr')

Table 2-10: Stream 2

Subchannel mode	audio
Bit rate	192 kbps (144 CUs)
Protection level	EEP 3-A
Subchannel identifier	1 (automatically assigned)
Service component	Park scene (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '192kbps PL3 Ster' (primary service component) Audio (program) service 'Secondary SCs ' (secondary service component '192kbps PL3 Ster')

Table 2-11: Stream 3

Subchannel mode	audio
Bit rate	160 kbps (120 CUs)
Protection level	EEP 3-A
Subchannel identifier	0 (automatically assigned)
Service component	Bach (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '160kbps PL3 Ster' (primary service component) Audio (program) service 'Secondary SCs ' (secondary service component '160kbps PL3 Ster')

Table 2-12: Stream 4

Subchannel mode	audio
Bit rate	128 kbps (96 CUs)
Protection level	EEP 3-A
Subchannel identifier	3 (automatically assigned)
Service component	Frequency sweep (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '128kbps PL3 Surr' (primary service component) Audio (program) service 'Secondary SCs ' (secondary service component '128kbps PL3 Surr')

Table 2-13: Stream 5

Subchannel mode	audio
Bit rate	96 kbps (48 CUs)
Protection level	EEP 4-A
Subchannel identifier	4 (automatically assigned)
Service component	Different sines on each channel (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service ' 96kbps PL4 Surr' (primary service component) Audio (program) service 'Secondary SCs ' (secondary service component ' 96kbps PL4 Surr')

Table 2-14: Stream 6

Subchannel mode	audio
Bit rate	96 kbps (72 CUs)
Protection level	EEP 3-A
Subchannel identifier	5 (automatically assigned)
Service component	16 tone (mono) (audio: live source or play list)
Service component used by	Audio (program) service ' 96kbps PL3 Mono' (primary service component) Audio (program) service 'Secondary SCs ' (secondary service component ' 96kbps PL3 Mono')
X-PAD service component	SLS PAD1 (Application: MOT Slideshow)
Bit rate	8000 bps
X-PAD apptype	12 (automatically assigned)
X-PAD service component	DLS PAD1 (Application: Dynamic labels)
Bit rate	200 bps
X-PAD apptype	2 (automatically assigned)
X-PAD service component	Journaline PAD1 (Application: Journaline(R))
Bit rate	6000 bps
Content providers	Fraunhofer Research News PAD1: 6000 bps
X-PAD apptype	4 (automatically assigned)

Table 2-15: Stream 7

Subchannel mode	audio
Bit rate	48 kbps (24 CUs)
Protection level	EEP 4-A
Subchannel identifier	13 (automatically assigned)
Service component	Sine 10 kHz (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '48kbps PL4 Ster' (primary service component) Audio (program) service 'Secondary SCs ' (secondary service component '48kbps PL4 Ster')

2.1.5 Expected Receiver Behavior

The recording comprises 25000 DAB frame (10 minutes). If the ETI player loops around, a dropout will occur.

2.1.5.1 Audio service "192 kbps PL1 Surr"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

Every DAB+ decoder including MPEG surround MUST be able to extract and play the surround signal. The encoded speech starts in the center speaker, then moves to the front left, back left, back right and front right speaker. The recording also contains some background noise (e.g., shuffling of papers) coming from some sources.

The audio parameters are: DAB+, 192 kbps, stereo, 48 kHz, no SBR, 5.1 MPEG surround with 5.1 output channels.

2.1.5.2 Audio service "192 kbps PL3 Ster"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal (park scene).

The audio parameters are: DAB+, 192 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

DAB+ Audio Variety (eti1_file.dabp_c)

2.1.5.3 Audio service "160 kbps PL3 Ster"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal (classical music).

The audio parameters are: DAB+, 160 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

2.1.5.4 Audio service "128 kbps PL3 Surr"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal (frequency sweep from 20 Hz to 20 kHz).

Every DAB+ decoder including MPEG surround MUST be able to extract and play the surround signal.

The audio parameters are: DAB+, 128 kbps, stereo, 48 kHz, no SBR, MPEG surround with 5.1 output channels.

2.1.5.5 Audio service " 96 kbps PL3 Surr"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

Every DAB+ decoder including MPEG surround MUST be able to extract and play the surround signal. The audio comprises several sines: center speaker (440 Hz), front left (880 Hz), back left (1760 Hz), back right (3520 Hz), front right (7040 Hz); LFE (80 Hz)

The audio parameters are: DAB+, 96 kbps, stereo, 48 kHz, no SBR, MPEG surround with 5.1 output channels.

2.1.5.6 Audio service " 96 kbps PL3 Mono"

This audio stream also contains PAD data: Dynamic Labels, Slideshow and Journaline[®].

Every DAB+ decoder MUST be able to extract and play the mono core of the signal (16 tones).

Every Dynamic Label decoder MUST be able to extract and present the encoded Dynamic Labels.

Every Slideshow decoder MUST be able to extract and present the encoded slides.

Every Journaline[®]. decoder MUST be able to extract and present the encoded Journaline[®] data.

DAB DAB+ Audio Mix (eti2_file.dabp_c)

A more detailed test of the data services is covered by ETI file "Data services".

The audio parameters are: DAB+, 96 kbps, mono, 32 kHz, no SBR, no MPEG surround.

2.1.5.7 Audio service " 48 kbps PL4 Ster"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal (10 kHz sine).

The audio parameters are: DAB+, 48 kbps, stereo, 48 kHz, SBR, no MPEG surround.

Audio service "Secondary SCs"

This service has 7 secondary service components. The Service Components and their Service Component Labels are equal to the Services mentioned before.

Every DAB+ receiver MUST be able to select this service and then to select any of its Service Components. The user MUST get an indication which service and which service component is played.

2.2 DAB DAB+ Audio Mix (eti2_file.dabp_c)

2.2.1 Purpose

This ETI file contains several DAB+ and MPEG Audio Layer II audio streams and program services that use these audio streams.

This tests permits to determine if:

- The receiver is able to handle ensembles with both DAB+ and MPEG Audio Layer II:
- The decoder is able to decode DAB+ from 192 kbps (maximum) down to 24 kbps.

2.2.2 General Ensemble Information

Ensemble label	'DAB/DAB+·mix' (abbreviated label: 'DAB/DAB+'; flag field 0xff00; character set EBU basic core)
Ensemble identifier	0xdab2
Transmission mode	1
Ensemble country	Germany (D) (ecc and country code: e0d)
International table for PTy codes	All countries, except for North America
Ensemble time zone	Europe/Berlin
DAB time format (FIG0/10)	Long-form version

2.2.3 Service Information

Table 2-16: Service 1 ('192kbps L II')

Service label	'192kbps-L·II' (abbreviated label: '192-L·II'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd07b (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Synthetic audio 1 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 1
SCIdS	0 (automatically assigned)

Table 2-17: Service 2 ('160kbps L II')

Service label	'160kbps-L-II' (abbreviated label: '160-L-II'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd07c (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Synthetic audio 2 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 2
SCIdS	0 (automatically assigned)

Table 2-18: Service 3 ('128kbps L II')

Service label	'128kbps-L-II' (abbreviated label: '128-L-II'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd07d (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Synthetic audio 3 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 3
SCIdS	0 (automatically assigned)

Table 2-19: Service 4 ('192kbps DAB+')

Service label	'192kbps-DAB+' (abbreviated label: '192-DAB+'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd07e (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Frequency sweep stereo (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 4
SCIdS	0 (automatically assigned)

Table 2-20: Service 5 ('96kbps DAB+')

Service label	'96kbps-DAB+' (abbreviated label: '96-DAB+'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd07f (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Sines (stereo) (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 5
SCIdS	0 (automatically assigned)

Table 2-21: Service 6 ('64kbps DAB+')

Service label	'64kbps·DAB+' (abbreviated label: '64·DAB+'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd080 (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Sine 100 Hz (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 6
SCIdS	0 (automatically assigned)

Table 2-22: Service 7 ('40kbps DAB+')

Service label	'40kbps·DAB+' (abbreviated label: '40·DAB+'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd081 (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Sine 10 kHz (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 7
SCIdS	0 (automatically assigned)

Table 2-23: Service 8 ('24kbps DAB+')

Service label	'24kbps·DAB+' (abbreviated label: '24·DAB+'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd082 (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Sine 1 kHz/-6dB (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 8
SCIdS	0 (automatically assigned)

2.2.4 Stream Information

Table 2-24: Stream 1

Subchannel mode	audio
Bit rate	192 kbps (140 CUs)
Protection level	UEP 3
Subchannel identifier	7 (automatically assigned)
Service component	Synthetic audio 1 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '192kbps L II ' (primary service component)

Table 2-25: Stream 2

Subchannel mode	audio
Bit rate	160 kbps (116 CUs)
Protection level	UEP 3
Subchannel identifier	8 (automatically assigned)
Service component	Synthetic audio 2 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '160kbps L II ' (primary service component)

Table 2-26: Stream 3

Subchannel mode	audio
Bit rate	128 kbps (96 CUs)
Protection level	UEP 3
Subchannel identifier	9 (automatically assigned)
Service component	Synthetic audio 3 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '128kbps L II ' (primary service component)

Table 2-27: Stream 4

Subchannel mode	audio
Bit rate	192 kbps (144 CUs)
Protection level	EEP 3-A
Subchannel identifier	10 (automatically assigned)
Service component	Frequency sweep stereo (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '192kbps DAB+ ' (primary service component)

Table 2-28: Stream 5

Subchannel mode	audio
Bit rate	96 kbps (72 CUs)
Protection level	EEP 3-A
Subchannel identifier	11 (automatically assigned)
Service component	Sines (stereo) (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service ' 96kbps DAB+ ' (primary service component)

Table 2-29: Stream 6

Subchannel mode	audio
Bit rate	64 kbps (48 CUs)
Protection level	EEP 3-A
Subchannel identifier	12 (automatically assigned)
Service component	Sine 100 Hz (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '64kbps DAB+ ' (primary service component)

Table 2-30: Stream 7

Subchannel mode	audio
Bit rate	40 kbps (30 CUs)
Protection level	EEP 3-A
Subchannel identifier	13 (automatically assigned)
Service component	Sine 10 kHz (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service ' 40kbps DAB+ ' (primary service component)

Table 2-31: Stream 8

Subchannel mode	audio
Bit rate	24 kbps (18 CUs)
Protection level	EEP 3-A
Subchannel identifier	14 (automatically assigned)
Service component	Sine 1 kHz/-6dB (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service ' 24kbps DAB+ ' (primary service component)

2.2.5 Expected Receiver Behavior

Every DAB+ decoder MUST be able to extract and play the DAB+ services.

Every MPEG Audio Layer II decoder MUST be able to extract and play the MPEG Audio Layer II services.

The recording comprises 25000 DAB frame (10 minutes). If the ETI player loops around, a dropout will occur.

2.2.5.1 Audio Service "192 kbps L II"

Every MPEG Audio Layer II decoder MUST be able to extract and play the signal (synthetic audio).

The audio parameters are: MPEG Audio Layer II, 192 kbps, stereo, 48 kHz, no MPEG surround.

2.2.5.2 Audio Service "160 kbps L II"

Every MPEG Audio Layer II decoder MUST be able to extract and play the signal (synthetic audio).

The audio parameters are: MPEG Audio Layer II, 160 kbps, stereo, 24 kHz, no MPEG surround.

DAB DAB+ Audio Mix (eti2_file.dabp_c)

2.2.5.3 Audio Service "128 kbps L II"

Every MPEG Audio Layer II decoder MUST be able to extract and play the signal (synthetic audio).

The audio parameters are: MPEG Audio Layer II, 128 kbps, stereo, 48 kHz, no MPEG surround.

2.2.5.4 Audio Service "192 kbps DAB+"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

The signal is a stereo frequency sweep from 20 Hz to 20 kHz.

The audio parameters are: DAB+, 192 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

2.2.5.5 Audio Service " 96 kbps DAB+"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

The signal is a 440 Hz sine on the left channel and a 880 Hz sine on the right channel.

The audio parameters are: DAB+, 96 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

2.2.5.6 Audio Service " 64 kbps DAB+"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

The signal is a 100 Hz sine on both channels.

The audio parameters are: DAB+, 64 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

2.2.5.7 Audio Service " 40 kbps DAB+"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

The signal is a 10 kHz sine on both channels.

The audio parameters are: DAB+, 40 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

2.2.5.8 Audio Service " 24 kbps DAB+"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

The signal is a 1 kHz sine (-6 dB) on both channels.

The audio parameters are: DAB+, 192 kbps, stereo, 48 kHz, SBR, no MPEG surround.

2.3 DAB+ Audio Changes (eti3_file.dabp_c)

2.3.1 Purpose

This ETI file contains several DAB+ audio streams. The bit rate of these streams is fixed. The audio configuration within these streams changes every 12s.



The audio configuration (sample rate, SBR mode, channel mode, surround mode) is signaled at the beginning of a DAB+ audio super frame. As long as the bit rate of a DAB+ stream is not changed, the audio configuration can be changed without needing a DAB multiplex reconfiguration. In theory, the audio configuration could be changed every DAB+ super frame.

This tests permits to determine if:

- The decoder is able to handle changes of the audio configuration. The DAB+ standard does not require a seamless switch to a new configuration; the broadcast is urged to plan audio configurations changes carefully (e.g. during a period of silence).
- The MPEG surround decoder is able to dynamically switch from and to surround mode.

2.3.2 General Ensemble Information

Ensemble label	'DAB+-audiochange' (abbreviated label: 'DAB+-chn'; flag field 0xf034; character set EBU basic core)
Ensemble identifier	0xdab3
Transmission mode	1
Ensemble country	Germany (D) (ecc and country code: e0d)
International table for PTy codes	All countries, except for North America
Ensemble time zone	Europe/Berlin
DAB time format (FIG0/10)	Long-form version

2.3.3 Service Information

Table 2-32: Service 1 ('64kbps stereo 1')

Service label	'64kbps-stereo-1' (abbreviated label: '64-str1'; flag field 0x61d1; character set EBU basic core)
Service identifier	0xd07b (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Audio reconfigs stereo1 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 1
SCIdS	0 (automatically assigned)

Table 2-33: Service 2 ('64kbps stereo 2')

Service label	'64kbps-stereo-2' (abbreviated label: '64-str2'; flag field 0x61d1; character set EBU basic core)
Service identifier	0xd07c (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Audio reconfigs stereo2 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 2
SCIdS	0 (automatically assigned)

Table 2-34: Service 3 ('128kbps surround')

Service label	'128kbps-surround' (abbreviated label: '128-surr'; flag field 0xe0f0; character set EBU basic core)
Service identifier	0xd07d (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Audio reconfigs surround1 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 3
SCIdS	0 (automatically assigned)

Table 2-35: Service 4 ('64kbps surround')

Service label	'64kbps-surround' (abbreviated label: '64-surr'; flag field 0xe0f0; character set EBU basic core)
Service identifier	0xd07e (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Audio reconfigs surround2 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 4
SCIdS	0 (automatically assigned)

Table 2-36: Service 5 ('128kbps mix')

Service label	'128kbps-mix' (abbreviated label: '128-mix-'; flag field 0xe0f0; character set EBU basic core)
Service identifier	0xd07f (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Audio reconfig mix1 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 5
SCIdS	0 (automatically assigned)

Table 2-37: Service 6 ('64kbps mix')

Service label	'64kbps-mix' (abbreviated label: '64-mix'; flag field 0xe0f0; character set EBU basic core)
Service identifier	0xd080 (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Audio reconfigs mix2 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 6
SCIdS	0 (automatically assigned)

2.3.4 Stream Information

Table 2-38: Stream 1

Subchannel mode	audio
Bit rate	64 kbps (48 CUs)
Protection level	EEP 3-A
Subchannel identifier	6 (automatically assigned)
Service component	Audio reconfigs stereo1 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '64kbps stereo 1' (primary service component)

Table 2-39: Stream 2

Subchannel mode	audio
Bit rate	64 kbps (48 CUs)
Protection level	EEP 3-A
Subchannel identifier	15 (automatically assigned)
Service component	Audio reconfigs stereo2 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '64kbps stereo 2' (primary service component)

Table 2-40: Stream 3

Subchannel mode	audio
Bit rate	128 kbps (96 CUs)
Protection level	EEP 3-A
Subchannel identifier	16 (automatically assigned)
Service component	Audio reconfigs surround1 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '128kbps surround' (primary service component)

Table 2-41: Stream 4

Subchannel mode	audio
Bit rate	64 kbps (48 CUs)
Protection level	EEP 3-A
Subchannel identifier	26 (automatically assigned)
Service component	Audio reconfigs surround2 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '64kbps surround' (primary service component)

Table 2-42: Stream 5

Subchannel mode	audio
Bit rate	128 kbps (96 CUs)
Protection level	EEP 3-A
Subchannel identifier	27 (automatically assigned)
Service component	Audio reconfigs mix1 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '128kbps mix ' (primary service component)

Table 2-43: Stream 6

Subchannel mode	Audio
Bit rate	64 kbps (48 CUs)
Protection level	EEP 3-A
Subchannel identifier	28 (automatically assigned)
Service component	Audio reconfigs mix2 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component used by	Audio (program) service '64kbps mix ' (primary service component)

2.3.5 Expected Receiver Behavior

Every DAB+ decoder MUST be able to extract and play the DAB+ services.

For all services, the signal is a 1 kHz, -6B sine.

The recording comprises 25000 DAB frame (10 minutes). If the ETI player loops around, a dropout will occur.

2.3.5.1 Audio Service "64 kbps stereo1"

Every DAB+ decoder MUST be able to extract and play the signal.

The signal switches audio configuration every 12 seconds (i.e., 5 times per minute). The following configurations are used (all at 64kbps):

DAB+ Audio Changes (eti3_file.dabp_c)

1	32 kHz, no SBR, mono
2	48 kHz, no SBR, mono
3	32 kHz, no SBR, stereo
4	48 kHz, no SBR, stereo
5	32 kHz, SBR, mono
6	48 kHz, SBR, mono
7	32 kHz, SBR, stereo
8	48 kHz, SBR, stereo
9	32 kHz, SBR, parametric stereo
10	48 kHz, SBR, parametric stereo

If SBR is off, the then AAC core runs at the indicated sample rate. If SBR is on, then the run runs at half the indicated sample rate.

Together with audio service "64kbps stereo2", this test contains all transitions from any of these configurations to any other configuration.

The stream iterate through these configurations the following way:

1 2 1 3 1 4 1 5 1 6 1 7 1 8 1 9 1 10 1

2 3 2 4 2 5 2 6 2 7 2 8 2 9 2 10 2

3 4 3 5 3 6 3 7 3 8 3 9 3 10

If the decoder produces an audible drop out when the configuration changes, this is no acceptable. However, the dropout should be as concealed as possible (no loud click or hissing). During the 12 seconds each configuration is used, no further dropouts must occur.

2.3.5.2 Audio Service "64 kbps stereo2"

Every DAB+ decoder MUST be able to extract and play the signal.

The signal uses the same configurations as audio service "64 kbps stereo1", but iterates through the remaining configurations:

3

4 5 4 6 4 7 4 8 4 9 4 10 4

5 6 5 7 5 8 5 9 5 10 5

6 7 6 8 6 9 6 10 6

7 8 7 9 7 10 7

8 9 8 10 8

9 10 9

3

If the decoder produces an audible drop out when the configuration changes, this is not acceptable. However, the dropout should be as concealed as possible (no loud click or hissing). During the 12 seconds each configuration is used, no further dropouts must occur.

2.3.5.3 Audio Service "128 kbps surround"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

Every DAB+ decoder including MPEG surround MUST be able to extract and play the surround signal.

The signal switches audio configuration every 12 seconds (i.e., 5 times per minute). The following configurations are used (all at 128kbps):

1	32 kHz, no SBR, mono
2	48 kHz, no SBR, mono
3	32 kHz, no SBR, stereo
4	48 kHz, no SBR, stereo
5	32 kHz, SBR, stereo
6	48 kHz, SBR, stereo

If SBR is off, the then AAC core runs at the indicated sample rate. If SBR is on, then the run runs at half the indicated sample rate.

This test contains all transitions from any of these configurations to any other configuration.

The stream iterate through these configurations the following way:

1 2 1 3 1 4 1 5 1 6 1

2 3 2 4 2 5 2 6 2

3 4 3 5 3 6 3

4 5 4 6 4

5 6 5

Then the loop starts over again.

If the decoder produces an audible drop out when the configuration changes, this is no acceptable. However, the dropout should be as concealed as possible (no loud click or hissing). During the 12 seconds each configuration is used, no further dropouts must occur.

2.3.5.4 Audio Service "64 kbps surround"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

Every DAB+ decoder including MPEG surround MUST be able to extract and play the surround signal.

The signal switches audio configuration every 12 seconds (i.e., 5 times per minute). The following configurations are used (all at 64kbps):

1	32 kHz, SBR, mono
2	48 kHz, SBR, mono
3	32 kHz, SBR, stereo
4	48 kHz, SBR, stereo

If SBR is off, the then AAC core runs at the indicated sample rate. If SBR is on, then the run runs at half the indicated sample rate.

This test contains all transitions from any of these configurations to any other configuration.

The stream iterate through these configurations the following way:

1 2 1 3 1 4 1

2 3 2 4 2

3 4 3

Then the loop starts over again.

If the decoder produces an audible drop out when the configuration changes, this is not acceptable. However, the dropout should be as concealed as possible (no loud click or hissing). During the 12 seconds each configuration is used, no further dropouts must occur.

2.3.5.5 Audio Service "128 kbps mix"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

Every DAB+ decoder including MPEG surround MUST be able to extract and play the surround signal of the configurations using surround sound.

The signal iterates over the following configurations (all at 128kbps) and then the loop starts over again.

Mono, no SBR, 32 kHz
Mono, no SBR, 32 kHz, 5.1 MPEG surround with 5.1 output channels
Mono, no SBR, 48 kHz
Mono, no SBR, 48 kHz, 5.1 MPEG surround with 5.1 output channels
Stereo, no SBR, 32 kHz
Stereo, no SBR, 32 kHz, 5.1 MPEG surround with 5.1 output channels
Stereo, no SBR, 48 kHz
Stereo, no SBR, 48 kHz, 5.1 MPEG surround with 5.1 output channels
Stereo, SBR, 32 kHz, 5.1 MPEG surround with 5.1 output channels
Stereo, SBR, 48 kHz, 5.1 MPEG surround with 5.1 output channels

If the decoder produces an audible drop out when the configuration changes, this is not acceptable. However, the dropout should be as concealed as possible (no loud click or hissing). During the 12 seconds each configuration is used, no further dropouts must occur.

2.3.5.6 Audio Service "64 kbps mix"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

Every DAB+ decoder including MPEG surround MUST be able to extract and play the surround signal of the configurations using surround sound.

The signal iterates over the following configurations (all at 128kbps) and then the loop starts over again.

Mono, no SBR, 32 kHz
Mono, no SBR, 32 kHz, 5.1 MPEG surround with 5.1 output channels
Mono, no SBR, 48 kHz
Mono, no SBR, 48 kHz, 5.1 MPEG surround with 5.1 output channels
Stereo, no SBR, 32 kHz
Stereo, no SBR, 32 kHz, 5.1 MPEG surround with 5.1 output channels
Stereo, no SBR, 48 kHz
Stereo, no SBR, 48 kHz, 5.1 MPEG surround with 5.1 output channels
Stereo, SBR, 32 kHz, 5.1 MPEG surround with 5.1 output channels
Stereo, SBR, 48 kHz, 5.1 MPEG surround with 5.1 output channels

If the decoder produces an audible drop out when the configuration changes, this is not acceptable. However, the dropout should be as concealed as possible (no loud click or hissing). During the 12 seconds each configuration is used, no further dropouts must occur.

2.4 DAB+ CISPR13/14 (eti4_file.dabp_c)

2.4.1 Purpose

This ETI file contains several DAB+ audio streams for EMC measurements.

2.4.2 General Ensemble Information

Ensemble label	'DAB+·CISPR13/14' (abbreviated label: 'DAB+·CIS'; flag field 0xff00; character set EBU basic core)
Ensemble identifier	0xdab4
Transmission mode	1
Ensemble country	Germany (D) (ecc and country code: e0d)
International table for PTy codes	All countries, except for North America
Ensemble time zone	Europe/Berlin
DAB time format (FIG0/10)	Long-form version

2.4.3 Service Information

Table 2-44: Service 1 ('1k fullscale')

Service label	'1k-fullscale' (abbreviated label: '1k-full'; flag field 0xfe00; character set EBU basic core)
Service identifier	0xd07b (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	1 kHz sine, full-scale CISPR13 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 1
SCIdS	0 (automatically assigned)

Table 2-45: Service 2 ('1k -6dB CISPR13')

Service label	'1k-6dB-CISPR13' (abbreviated label: '1k-6dB'; flag field 0xfe00; character set EBU basic core)
Service identifier	0xd07c (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	1 kHz sine, -6dB CISPR13 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 2
SCIdS	0 (automatically assigned)

Table 2-46: Service 3 ('1k -10dB CISPR13')

Service label	'1k-10dB-CISPR13' (abbreviated label: '110-surr'; flag field 0xff00; character set EBU basic core)
Service identifier	0xd07d (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	1 kHz sine, -10dB CISPR13 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 3
SCIdS	0 (automatically assigned)

Table 2-47: Service 4 ('1k -60dB CISPR14')

Service label	'1k-60dB-CISPR14' (abbreviated label: '110-surr'; flag field 0xff00; character set EBU basic core)
Service identifier	0xd07e (audio service)
Program type (PTy)	Education (PTy code 5; code for all countries except North America)
Program language	German (language code 8)
Primary service component	1 kHz sine, -60dB CISPR14 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Service component carried in	Stream 4
SCIdS	0 (automatically assigned)

2.4.4 Stream Information

Table 2-48: Stream 1

Subchannel mode	audio
Bit rate	192 kbps (144 CUs)
Protection level	EEP 3-A
Subchannel identifier	17 (automatically assigned)
Service component	1 kHz sine, full-scale CISPR13 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Audio configuration	MPEG Audio Layer II (,
Service component used by	Audio (program) service '1k fullscale ' (primary service component)

Table 2-49: Stream 2

Subchannel mode	audio
Bit rate	192 kbps (144 CUs)
Protection level	EEP 3-A
Subchannel identifier	18 (automatically assigned)
Service component	1 kHz sine, -6dB CISPR13 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Audio configuration	MPEG Audio Layer II (,
Service component used by	Audio (program) service '1k -6dB CISPR13' (primary service component)

Table 2-50: Stream 3

Subchannel mode	audio
Bit rate	192 kbps (144 CUs)
Protection level	EEP 3-A
Subchannel identifier	19 (automatically assigned)
Service component	1 kHz sine, -10dB CISPR13 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Audio configuration	MPEG Audio Layer II (,
Service component used by	Audio (program) service '1k -10dB CISPR13' (primary service component)

Table 2-51: Stream 4

Subchannel mode	audio
Bit rate	192 kbps (144 CUs)
Protection level	EEP 3-A
Subchannel identifier	20 (automatically assigned)
Service component	1 kHz sine, -60dB CISPR14 (Protocol: Audio subchannel insertion (Layer 2 or HE-AAC v2))
Audio configuration	MPEG Audio Layer II (,
Service component used by	Audio (program) service '1k -60dB CISPR14' (primary service component)

2.4.5 Expected Receiver Behavior

Every DAB+ decoder MUST be able to extract and play the DAB+ services.

The recording comprises 25000 DAB frame (10 minutes). If the ETI player loops around, a dropout will occur.

2.4.5.1 Audio Service "1 k fullscale"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

The signal is a 1 kHz sine, full scale, CISPR 13.

The audio parameters are: DAB+, 192 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

2.4.5.2 Audio Service "1 k -6dB CISPR13"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

The signal is a 1 kHz sine, -6dB, CISPR 13.

The audio parameters are: DAB+, 192 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

2.4.5.3 Audio Service "1 k -10dB CISPR13"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

The signal is a 1 kHz sine, -10dB, CISPR 13.

The audio parameters are: DAB+, 192 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

2.4.5.4 Audio Service "1 k -60dB CISPR14"

Every DAB+ decoder MUST be able to extract and play the stereo core of the signal.

The signal is a 1 kHz sine, -60dB, CISPR 14.

The audio parameters are: DAB+, 192 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

2.5 DATA Services (eti5_file.dabp_c)

2.5.1 Purpose

This ETI file contains several data applications in PAD an packet mode. In addition this multiplex contains many secondary services (e.g. an audio service has a secondary data service component or a data service has a secondary audio service component).

Therefore this tests permits to determine if:

- The FIC decoder is able to process a complex multiplex.
- The receiver is able to decode and present several DAB data applications.

2.5.2 General Ensemble Information

Ensemble label	'Data services' (abbreviated label: 'Data'; flag field 0xf000; character set EBU basic core)
Ensemble identifier	0xd06c
Transmission mode	1
Ensemble country	Germany (D) (ecc and country code: e0d)
International table for PTy codes	All countries, except for North America
Ensemble time zone	Europe/Berlin
DAB time format (FIG0/10)	Long-form version

2.5.3 Service Information

Table 2-52: Service 1 ('192kbps LII A')

Service label	'192kbps·LII·A' (abbreviated label: '192LII·A'; flag field 0xe0f8; character set EBU basic core)
Service identifier	0xd220 (audio service)
Program type (PTy)	Serious Classical (PTy code 14; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Bach (live coded) (audio: live source or play list)
Service component carried in	Stream 1
SCIdS	0 (automatically assigned)
PAD data	SLS PAD1 (Application: MOT Slideshow) DLS PAD1 (Application: Dynamic labels) Journaline PAD1 (Application: Journaline(R))

Table 2-53: Service 2 ('96kbps DAB+ A')

Service label	'96kbps·DAB+·A' (abbreviated label: '96DAB+A'; flag field 0xe0f4; character set EBU basic core)
Service identifier	0xd210 (audio service)
Program type (PTy)	Pop Music (PTy code 10; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Herre (audio: live source or play list)
Service component carried in	Stream 2
SCIdS	0 (automatically assigned)
PAD data	SLS PAD2 (Application: MOT Slideshow) DLS PAD2 (Application: Dynamic labels) Journaline PAD2 (Application: Journaline(R))
Service component label	'Audio' (abbreviated label: 'Audio'; flag field 0xfc00; character set EBU basic core)

Table 2-54: Service 3 ('192kbps LII')

Service label	'192kbps-LII' (abbreviated label: '192-LII'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd07b (audio service)
Program type (PTy)	Serious Classical (PTy code 14; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Bach (live coded) (audio: live source or play list)
Service component carried in	Stream 1
SCIdS	0 (automatically assigned)
PAD data	SLS PAD1 (Application: MOT Slideshow) DLS PAD1 (Application: Dynamic labels) Journaline PAD1 (Application: Journaline(R))
Service component label	'Audio1' (abbreviated label: 'Audio1'; flag field 0xfc00; character set EBU basic core)
Secondary service component 1	BWS Simple (Application: MOT Broadcast Web Site)
Service component carried in	Stream 4
SCIdS	1 (automatically assigned)
Service component label	'BWS-Simple' (abbreviated label: 'BWS-Simp'; flag field 0xff00; character set EBU basic core)

Table 2-55: Service 4 ('96kbps DAB+')

Service label	'96kbps·DAB+' (abbreviated label: '96·DAB+'; flag field 0xe1f0; character set EBU basic core)
Service identifier	0xd07c (audio service)
Program type (PTy)	Pop Music (PTy code 10; code for all countries except North America)
Program language	German (language code 8)
Primary service component	Herre (audio: live source or play list)
Service component carried in	Stream 2
SCIdS	0 (automatically assigned)
PAD data	SLS PAD2 (Application: MOT Slideshow) DLS PAD2 (Application: Dynamic labels) Journaline PAD2 (Application: Journaline(R))
Service component label	'Audio2' (abbreviated label: 'Audio2'; flag field 0xfc00; character set EBU basic core)
Secondary service component 1	BWS Full (Application: MOT Broadcast Web Site)
Service component carried in	Stream 4
SCIdS	1 (automatically assigned)
Service component label	'BWS·Full' (abbreviated label: 'BWS·Full'; flag field 0xff00; character set EBU basic core)

Table 2-56: Service 5 ('SLS Slide NOW')

Service label	'SLS·Slide·NOW' (abbreviated label: 'SL·NOW'; flag field 0xd038; character set EBU basic core)
Service identifier	0xe0dcafe1 (data service)
Primary service component	SLS SL NOW (Application: MOT Slideshow)
Service component carried in	Stream 3
SCIdS	0 (automatically assigned)

Table 2-57: Service 6 ('SLS Slide Abs')

Service label	'SLS·Slide·Abs' (abbreviated label: 'SL·Abs'; flag field 0xd038; character set EBU basic core)
Service identifier	0xe0dcafe2 (data service)
Primary service component	SLS SL ABS (Application: MOT Slideshow)
Service component carried in	Stream 3
SCIdS	0 (automatically assigned)

Table 2-58: Service 7 ('SLS HdrUpd NOW')

Service label	'SLS·HdrUpd·NOW' (abbreviated label: 'HU·NOW'; flag field 0x093c; character set EBU basic core)
Service identifier	0xe0dcafe3 (data service)
Primary service component	SLS HU NOW (Application: MOT Slideshow)
Service component carried in	Stream 3
SCIdS	0 (automatically assigned)

Table 2-59: Service 8 ('SLS HdrUpd Abs')

Service label	'SLS·HdrUpd·Abs' (abbreviated label: 'HU·Abs'; flag field 0x093c; character set EBU basic core)
Service identifier	0xe0dcafe4 (data service)
Primary service component	SLS HU ABS (Application: MOT Slideshow)
Service component carried in	Stream 3
SCIdS	0 (automatically assigned)

Table 2-60: Service 9 ('BWS Simple')

Service label	'BWS·Simple' (abbreviated label: 'BWS·Simp'; flag field 0xff00; character set EBU basic core)
Service identifier	0xe0dcafe5 (data service)
Primary service component	BWS Simple (Application: MOT Broadcast Web Site)
Service component carried in	Stream 4
SCIdS	0 (automatically assigned)
Service component label	'BWS' (abbreviated label: 'BWS'; flag field 0xe000; character set EBU basic core)
Secondary service component 1	Bach (live coded) (audio: live source or play list)
Service component carried in	Stream 1
SCIdS	1 (automatically assigned)
PAD data	SLS PAD1 (Application: MOT Slideshow) DLS PAD1 (Application: Dynamic labels) Journaline PAD1 (Application: Journaline(R))
Service component label	'192kbps·LII' (abbreviated label: '192·LII'; flag field 0xe1f0; character set EBU basic core)

Table 2-61: Service 10 ('BWS Full')

Service label	'BWS·Full' (abbreviated label: 'BWS·Full'; flag field 0xff00; character set EBU basic core)
Service identifier	0xe0dcafe6 (data service)
Primary service component	BWS Full (Application: MOT Broadcast Web Site)
Service component carried in	Stream 4
SCIdS	0 (automatically assigned)
Service component label	'BWS' (abbreviated label: 'BWS'; flag field 0xe000; character set EBU basic core)
Secondary service component 1	Herre (audio: live source or play list)
Service component carried in	Stream 2
SCIdS	1 (automatically assigned)
PAD data	SLS PAD2 (Application: MOT Slideshow) DLS PAD2 (Application: Dynamic labels) Journaline PAD2 (Application: Journaline(R))
Service component label	'·96kbps·DAB+' (abbreviated label: '96·DAB+'; flag field 0xe1f0; character set EBU basic core)

Table 2-62: Service 11 ('EPG')

Service label	'EPG' (abbreviated label: 'EPG'; flag field 0xe000; character set EBU basic core)
Service identifier	0xe0dcafe7 (data service)
Primary service component	EPG (Application: Electronic Program Guide (EPG))
Service component carried in	Stream 5
SCIdS	0 (automatically assigned)

Table 2-63: Service 12 ('Journaline')

Service label	'Journaline' (abbreviated label: 'Journal'; flag field 0xfe00; character set EBU basic core)
Service identifier	0xe0dcafe9 (data service)
Primary service component	Journaline full (Application: Journaline(R))
Service component carried in	Stream 4
SCIdS	0 (automatically assigned)

Table 2-64: Service 13 ('TPEG Mobile.Info')

Service label	'TPEG-Mobile.Info' (abbreviated label: 'TPEG-M.I'; flag field 0xf418; character set EBU basic core)
Service identifier	0xe0dcafea (data service)
Primary service component	TPEG (Application: TPEG (traffic and travel information))
Service component carried in	Stream 5
SCIdS	0 (automatically assigned)

Table 2-65: Service 14 ('TPEG Encr/Journy')

Service label	'TPEG-Encr/Journy' (abbreviated label: 'TPEG-E/J'; flag field 0xf460; character set EBU basic core)
Service identifier	0xe0dcafeb (data service)
Primary service component	TPEG Encrypted Journaline (Application: TPEG (traffic and travel information))
Service component carried in	Stream 5
SCIdS	0 (automatically assigned)

2.5.4 Stream Information

Table 2-66: Stream 1

Subchannel mode	audio
Bit rate	192 kbps (140 CUs)
Protection level	UEP 3
Subchannel identifier	25 (automatically assigned)
Service component	Bach (live coded) (audio: live source or play list)
Audio configuration	MPEG Audio Layer II (stereo, 48 kHz, no MPEG surround)
Service component used by	Audio (program) service '192kbps LII A ' (primary service component) Audio (program) service '192kbps LII ' (primary service component 'Audio1 ') Data service 'BWS Simple ' (secondary service component '192kbps LII ')
X-PAD service component	SLS PAD1 (Application: MOT Slideshow)
Bit rate	8000 bps
X-PAD apptype	12 (automatically assigned)
X-PAD service component	DLS PAD1 (Application: Dynamic labels)
Bit rate	200 bps
X-PAD apptype	2 (automatically assigned)
X-PAD service component	Journaline PAD1 (Application: Journaline(R))
Bit rate	6000 bps
Content providers	Fraunhofer Research News PAD1: 6000 bps
X-PAD apptype	4 (automatically assigned)

Table 2-67: Stream 2

Subchannel mode	audio
Bit rate	96 kbps (72 CUs)
Protection level	EEP 3-A
Subchannel identifier	26 (automatically assigned)
Service component	Herre (audio: live source or play list)
Audio configuration	DAB+ (stereo, 48 kHz, SBR off, no MPEG surround)
Service component used by	Audio (program) service ' 96kbps DAB+ A ' (primary service component 'Audio ') Audio (program) service ' 96kbps DAB+ ' (primary service component 'Audio2 ') Data service 'BWS Full ' (secondary service component ' 96kbps DAB+ ')
X-PAD service component	SLS PAD2 (Application: MOT Slideshow)
Bit rate	8000 bps
X-PAD apptype	12 (automatically assigned)
X-PAD service component	DLS PAD2 (Application: Dynamic labels)
Bit rate	200 bps
X-PAD apptype	2 (automatically assigned)
X-PAD service component	Journaline PAD2 (Application: Journaline(R))
Bit rate	6000 bps
Content providers	Fraunhofer Research News PAD2: 6000 bps
X-PAD apptype	4 (automatically assigned)

Table 2-68: Stream 3

Subchannel mode	packet mode
Bit rate	64 kbps (48 CUs)
Protection level	EEP 3-A
Enhanced packet mode	no
Assigned bit rate	64000.0 bps
Subchannel identifier	27 (automatically assigned)
Service component	SLS SL NOW (Application: MOT Slideshow)
Service component used by	Data service 'SLS Slide NOW ' (primary service component)
Bit rate	16000 bps
Packet address	1 (automatically assigned)
SCID	0 (automatically assigned)
Service component	SLS SL ABS (Application: MOT Slideshow)
Service component used by	Data service 'SLS Slide Abs ' (primary service component)
Bit rate	16000 bps
Packet address	2 (automatically assigned)
SCID	1 (automatically assigned)
Service component	SLS HU NOW (Application: MOT Slideshow)
Service component used by	Data service 'SLS HdrUpd NOW ' (primary service component)
Bit rate	16000 bps
Packet address	3 (automatically assigned)
SCID	2 (automatically assigned)
Service component	SLS HU ABS (Application: MOT Slideshow)
Service component used by	Data service 'SLS HdrUpd Abs ' (primary service component)
Bit rate	16000 bps
Packet address	4 (automatically assigned)
SCID	3 (automatically assigned)

Table 2-69: Stream 4

Subchannel mode	packet mode
Bit rate	96 kbps (72 CUs)
Protection level	EEP 3-A
Enhanced packet mode	no
Assigned bit rate	87100.0 bps
Subchannel identifier	28 (automatically assigned)
Service component	BWS Simple (Application: MOT Broadcast Web Site)
Service component used by	Audio (program) service '192kbps LII ' (secondary service component 'BWS Simple ') Data service 'BWS Simple ' (primary service component 'BWS ')
Bit rate	64000 bps
Content providers	BWS Simple (Journaline): 32000 bps BWS Simple (Surround): 32000 bps
Packet address	5 (automatically assigned)
SCID	4 (automatically assigned)
Service component	BWS Full (Application: MOT Broadcast Web Site)
Service component used by	Audio (program) service ' 96kbps DAB+ ' (secondary service component 'BWS Full ') Data service 'BWS Full ' (primary service component 'BWS ')
Bit rate	16000 bps
Content providers	BWS Full: 16000 bps
Packet address	6 (automatically assigned)
SCID	5 (automatically assigned)
Service component	Journaline full (Application: Journaline(R))
Service component used by	Data service 'Journaline' (primary service component)
Bit rate	7100 bps
Content providers	Deutsche Welle Nachrichten: 1000 bps Deutsche Welle News: 1000 bps Deutsche Welle News (Hindi): 1000 bps Fraunhofer Research News: 4000 bps Journaline Ticker: 100 bps

Packet address	7 (automatically assigned)
SCID	6 (automatically assigned)

Table 2-70: Stream 5

Subchannel mode	packet mode
Bit rate	24 kbps (18 CUs)
Protection level	EEP 3-A
Enhanced packet mode	no
Assigned bit rate	24000.0 bps
Subchannel identifier	29 (automatically assigned)
Service component	EPG (Application: Electronic Program Guide (EPG))
Service component used by	Data service 'EPG' (primary service component)
Bit rate	21000 bps
Content providers	EPG: 17000 bps EPG test files: 4000 bps
Packet address	8 (automatically assigned)
SCID	7 (automatically assigned)
Service component	TPEG (Application: TPEG (traffic and travel information))
Service component used by	Data service 'TPEG Mobile.Info' (primary service component)
Bit rate	2000 bps
Packet address	9 (automatically assigned)
SCID	8 (automatically assigned)
Service component	TPEG Encrypted Journaline (Application: TPEG (traffic and travel information))
Service component used by	Data service 'TPEG Encr/Journy' (primary service component)
Bit rate	1000 bps
Packet address	10 (automatically assigned)
SCID	9 (automatically assigned)

2.5.5 Description of Data Service Components

2.5.5.1 Service Component "SLS PAD"

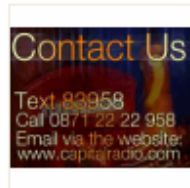
A sequence of real-world slides provided by GCap media plc. The slides are broadcast without a gap between two slides. The presentation time of a slide depends on the transmission time of the next slide.



1748054.jpg



capital_breakf...



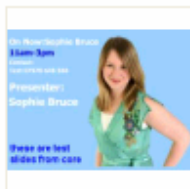
contact_us_s...



news.jpg



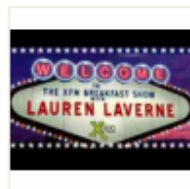
onair.jpg



SlideShow2_...



slideshow3.jpg

static_laverne_s
m.jpg

travel.jpg

The file lengths are as follows:

File name	Length of MOT body (JPG file)
1748054.jpg	7593
capital_breakfast_nosunsilk_sm.jpg	10339
contact_us_sm.jpg	12837
news.jpg	12889
onair.jpg	13112
SlideShow2_mid.jpg	10204
slideshow3.jpg	9450
static_laverne_sm.jpg	12110
travel.jpg	13280

Please note that the filenames are not used as ContentNames. However, the files are broadcast in the sequence shown above.

2.5.5.2 Service Component "DLS PAD"

A sequence of Dynamic Labels. Each Dynamic Labels is presented for 10 seconds.

There are three different sources for the sequence of Dynamic Labels (DL). The sequence starts with a message of group 1, followed by a message of group 2, followed by a message of group 3 and then again of group 1 and so on. The prefix of the DL indicates the used source.

Group	Prefix	Description
Test messages	1/3:	The following DLs: <ul style="list-style-type: none"> • short • a bit longer DLS • this is an extremely long dynamic label that easily exceeds the maximum of 128 characters per message, and this is a test. • Special characters: äöüàèùòáéúóĂÖÛß
German news (DW online)	2/3:	A sequence of German news headlines
English news (DW online)	3/3:	A sequence of English news headlines

DATA Services (eti5_file.dabp_c)

2.5.5.3 Service Component "Journaline PAD"

Carries a Journaline® data application. The content shows Fraunhofer Research news (English). The entry page is a menu starting with the following entries:



The screenshot shows the Journaline® website interface. At the top left is the "NewsService Journaline®" logo. At the top right is the "Journaline®" logo. Below the logos are navigation buttons: "< previous", "↑ up", and "next >". A search bar contains the text "Fraunhofer Research News PAD1". Below the search bar is a highlighted section titled "Fraunhofer Research News PAD1". Under this section is a list of ten blue hyperlinks:

- [Gene hunt in dyslexia](#)
- [Simplifying data management for farmers](#)
- [Using electrons to treat organic seeds](#)
- [Writing patterns, logos and lettering in light](#)
- [Ultrasound reduces number of animal tests](#)
- [Spectral imager for detecting bruised fruit](#)
- [The hybrid offensive](#)
- [Building bridges to the Far East](#)
- [Fraunhofer in Korea – Trends for mega cities](#)
- [Functional food – delicious and healthy](#)

2.5.5.4 Service Component "SLS"

A sequence of numbered slides. All slides are presented for 20 seconds.



001_SFU_sma...



002_SFE_sma...



003_SFE100_...



004_DVSG_s...



005_ETL_sma...



006_DVM400...



End_small.jpg

The file lengths are as follows:

File name	Length of MOT body (JPG file)
001_SFU_small_1.png	17145
002_SFE_small_2.jpg	7105
003_SFE100_small_3.png	17290
004_DVSG_small_4.jpg	8728
005_ETL_small_5.png	15904
006_DVM400_small_6.jpg	8048
End_small.jpg	991

Please note that the filenames are not used as ContentNames. However, the files are broadcast in the sequence shown above.

Please note that the 4 services in packet mode will display the slides at different instances in time.

- Service "SLS Slide NOW" tells the Slideshow decoder to preset the slide as soon as it is received. Slower receivers (or receivers that because of some reception problem during the first transmission need a slide repetition) might thus show the slide slightly later than fast receivers (or receiver that get the slide at the first transmission).
- Service "SLS Slide ABS" tells the Slideshow decoder to preset the slide at the end of the transmission (and possibly repetition) of the slide. All receivers should present the slide at the same time.
- Service "SLS HDR NOW" first broadcasts (and possibly repeats) a slide and then uses a HeaderUpdate telling the Slideshow decoder to preset the slide as soon as it is received. Slower receivers might thus show the slide slightly later than fast receivers.
- Service "SLS HDR ABS" first broadcasts (and possibly repeats) a slide and then uses a HeaderUpdate telling the Slideshow decoder to preset the slide some time in the future. All receivers should present the slide at the same time.

2.5.5.5 Service Component "BWS Simple"

A BWS data application describing both Journaline[®] and MPEG surround for DAB. The entry page is:

Technologies

New technologies within [WorldDMB](#) are:

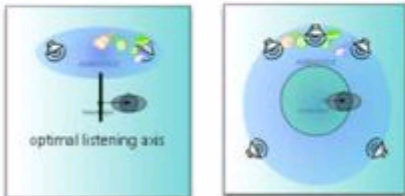
- [Surround Sound](#)
- [Journaline\(R\)](#)

The link "Surround Sound" leads to (only the beginning is shown):

Surround Sound

Why Surround Sound?

"Bring Carnegie Hall to your living room!" could be the slogan for multi-channel music. The sound experience is made possible by a special setup of speakers, the so-called 5.1 surround home theatre system. Three of the five speakers are positioned in front of the listener, two in the rear, while the subwoofer produces the resounding low notes and can be placed out of sight. The listener is instantly engulfed by the music and is able to feel it physically. This spatial experience is created by delivering the ambient reflections and reverberation tails of a concert hall or of a studio environment via the rear speakers. Through the integration of the center speaker, the sound panorama remains stable in a larger space. Additionally, the surround-sound effect encompasses the listener from all directions.



Stereo Playback Surround Playback

The link "Journaline(R)" leads to (only the beginning is shown):

Journaline® overview

[Introduction](#)
[Functionality](#)
[Object types](#)
[Object coding](#)
[Transport in DAB and DRM](#)
[Status](#)
[Bibliography and references](#)

Introduction

All modern digital radio standards permit to broadcast short text messages. RDS "Radio Text", DAB "Dynamic Label" and DRM "Text Messages" provide almost the same functionality. The big advantage of this simple data service is the support by almost every receiver. This data service is mainly intended for programme associated information: title/artist, news headlines, wheather information or the web site of the station.

The broadcaster decides what type of information is presented and in what order. The listener can neither select the type of information he is interesed in, nor can he access the information whenever he wants.

2.5.5.6 Service Component "BWS Full"

This BWS contains links to test whether the BWS engine is able to correctly process absolute links (e.g. "/images/logo.jpg") and links to directories. If a link to a directory is selected (e.g. to "/traffic/"), then the receiver should retrieve a file within this directory that depends on its profile. If the DirectoryIndex parameter within the MOT directory signals "index_255.html" for the "Unrestricted (PC) profile", then such a receiver should thus retrieve file "/traffic/index_255.html".

Several links within the HTML pages indicate the encoded HTML link and the supposed behavior of the BWS engine.

There is also a file of length 0. There will be no MOT body broadcast for this MOT object.

The entry page for the "Unrestricted (PC) profile" (ContentName "index_255.htm") starts with:

Entry page of profile 255

Filename of this file: "index_255.htm"

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These files are provided for development and test of DAB receivers or for the demonstration of DAB data services. Other uses than these require the prior written consent of Fraunhofer IIS or Rohde & Schwarz.

2.5.5.7 Service Component "EPG"

It contains data for 2 services:

- d210 (Deutschlandfunk; in this ETI file service "96kbps DAB+ A")
- d220 (DKultur; in this ETI file service "192kbps LII A")
- d230 (Test)

An EPG decoder must be able to decode and present the EPG for both audio services "96kbps DAB+ A" and "192kbps LII A".

The test EPG files use all elements/attributes the EPG specification permits. The content is nonsense, but the EPG decoder must be able to parse these files. For example files refer to the documentation directory.

The beginning of file "w20081010wdD210C0.EHB" is:

```
- <epg>
  - <schedule version="1">
    <scope stopTime="2008-10-11T00:00:00+02:00" startTime="2008-10-10T00:00:00+02:00"/>
    - <programme shortId="50001">
      - <epg:location>
        <epg:time time="2008-10-10T00:00:00+02:00" duration="PT0H5M0S"/>
        <epg:bearer id="e0.d06c.d210.0"/>
      </epg:location>
      <epg:mediumName>Nachrichten</epg:mediumName>
    </programme>
    - <programme shortId="50002">
      - <epg:mediaDescription>
        <epg:shortDescription>Kultur vom Tage</epg:shortDescription>
      </epg:mediaDescription>
      - <epg:location>
        <epg:time time="2008-10-10T00:05:00+02:00" duration="PT0H55M0S"/>
        <epg:bearer id="e0.d06c.d210.0"/>
      </epg:location>
      <epg:mediumName>Fazit</epg:mediumName>
    </programme>
    - <programme shortId="50003">
      - <epg:location>
        <epg:time time="2008-10-10T01:00:00+02:00" duration="PT0H5M0S"/>
        <epg:bearer id="e0.d06c.d210.0"/>
      </epg:location>
      <epg:mediumName>Nachrichten</epg:mediumName>
    </programme>
```

2.5.5.8 Service Component "Journaline"

This data application comprises several sources. It contains news messages in German, English and Hindi (non European characters!) an Fraunhofer Research news. It also contains a news ticker. This ticker changes every 20 seconds. It can be used to check whether the Journaline decoder is able to correctly process updates of an object. The OID of the ticker is 60001.

The entry page of the service looks like:



2.5.5.9 Service Component "TPEG"

This recording made during the Mobile.Info project starts at 09:00. It starts with a stream directory. This is repeated every 10 seconds. Its size is 13 bytes.

Within the first minute there is just an SNI component that signals an additional TEC component. Since there are no TPEG messages available, the TEC component is not yet within the TPEG stream. This TPEG frame has a size of 86 bytes.

At 09:01 a TEC messages gets available (MessageID = 1, VersionNumber = 0). The size of the TPEG transport frame increases to 145 bytes.

At 09:02 this message is updated (MessageID = 1, VersionNumber = 1). The size of the TPEG transport frame remains at 145 bytes.

At 09:03 the message gets a Cancellation (MessageID = 1, VersionNumber = 2); the size decreases to 113 bytes.

DATA Services (eti5_file.dabp_c)

At 09:03:59 the recording ends. In real-life, the message would still be broadcast for 15 minutes and might then be removed from the broadcast cycle.

In this ETI file, the 4 minute cycle starts from scratch.

The TPEG Service uses SID ABC = 0.44.203 (decimal), the TPEG Service Name is "TEC cycle", the Service Description is "TEC cycle generated by GEWI".

2.5.5.10 Service Component "TPEG Encr/Journey"

This data application uses two TPEG frames. The first frame carries three encrypted Journaline objects with OID 0x2ee1, 0x2eeb and 0x2eec. The used CAS is 124.

The second frame carries three unencrypted Journaline objects with OID 0x0005, 0x4e23, 0x6d61.

2.5.6 Service Description / Expected Receiver Behavior

The recording comprises 25000 DAB frames (10 minutes). If the ETI player loops around, a dropout will occur.

2.5.6.1 Audio Service "192kbps LII A"

Every MPEG Audio Layer II decoder MUST be able to extract and play the signal (classical music).

The audio parameters are: MPEG Audio Layer II, 192 kbps, stereo, 48 kHz, no MPEG surround.

The PAD channel of the audio carries the service components "SLS PAD" (Slideshow), "DLS PAD" (Dynamic Labels) and "Journaline PAD" (Journaline®).

2.5.6.2 Audio Service "96kbps DAB+ A"

Every DAB+ decoder MUST be able to extract and play the signal (synthetic audio).

The audio parameters are: DAB+, 96 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

The PAD channel of the audio carries the service components "SLS PAD" (Slideshow), "DLS PAD" (Dynamic Labels) and "Journaline PAD" (Journaline®).

2.5.6.3 Audio Service "192kbps LII"

Every MPEG Audio Layer II decoder MUST be able to extract and play the signal (classical music).

The audio parameters are: MPEG Audio Layer II, 192 kbps, stereo, 48 kHz, no MPEG surround.

The PAD channel of the audio carries the service components "SLS PAD" (Slideshow), "DLS PAD" (Dynamic Labels) and "Journaline PAD" (Journaline[®]).

The audio service has a secondary data service components ("BWS Simple").

2.5.6.4 Audio Service "96kbps DAB+"

Every DAB+ decoder MUST be able to extract and play the signal (synthetic audio).

The audio parameters are: DAB+, 96 kbps, stereo, 48 kHz, no SBR, no MPEG surround.

The PAD channel of the audio carries the service components "SLS PAD" (Slideshow), "DLS PAD" (Dynamic Labels) and "Journaline PAD" (Journaline[®]).

The audio service has a secondary data service components ("BWS Full").

2.5.6.5 Data Service "SLS Slide NOW"

The data service is a slideshow that uses TriggerTime NOW in the MOT headers of the slide objects for triggering.

Service component "SLS" provides more details about the broadcast slides.

2.5.6.6 Data Service "SLS Slide ABS"

The data service is a slideshow that uses an absolute TriggerTime in the MOT headers of the slide objects for triggering.

Service component "SLS" provides more details about the broadcast slides.

2.5.6.7 Data Service "SLS HdrUpd NOW"

The data service is a slideshow that uses TriggerTime NOW in a HeaderUpdate object for triggering. The slides do not have a parameter TriggerTime.

Service component "SLS" provides more details about the broadcast slides.

2.5.6.8 Data Service "SLS HdrUpd ABS"

The data service is a slideshow that uses an absolute TriggerTime in a HeaderUpdate object for triggering. The slides do not have a parameter TriggerTime.

Service component "SLS" provides more details about the broadcast slides.

2.5.6.9 Data Service "BWS Simple"

This data service is a Broadcast Web Side as primary service component and a secondary audio service component (classical music) including PAD data.

2.5.6.10 Data Service "BWS Full"

This data service is a Broadcast Web Side as primary service component and a secondary audio service component (synthetic audio) including PAD data.

2.5.6.11 Data Service "EPG"

This data service is an EPG describing two audio services ("192kbps LII A" and "96kbps DAB+ A").

2.5.6.12 Data Service "Journaline"

This data service is a Journaline[®] data application.

2.5.6.13 Data Service "TPEG Mobile.Info"

This data service carries a TPEG data application.

2.5.6.14 Data Service "TPEG Encr/Journy"

This data service carries a TPEG data application with CAI and Journaline embedded in TPEG frames.



ROHDE & SCHWARZ GmbH & Co. KG ▪ Muehldorfstraße 15 ▪ D-81671 Muenchen
Tel. (+49 89) 4129-0 ▪ customersupport@rohde-schwarz.com ▪ www.rohde-schwarz.com

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