This document describes the following software options:

- R&S®AMU-K57  
  1403.4102.02
- R&S®SMATE-K57  
  1400.6450.02
- R&S®SMBV-K57  
  1415.8190.xx
- R&S®SMJ-K57  
  1403.6350.02
- R&S®SMU-K57  
  1403.6250.02

This manual version corresponds to firmware version:
FW 3.50.082.xx and later of the R&S®SMBV100A
FW 3.20.286.xx and later of the R&S®SMU200A, R&S®SMATE200A, R&S®SMJ100A and R&S®AMU200A
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1 Preface

1.1 Documentation Overview

This section provides an overview of the R&S Signal Generator user documentation. You find it on the product page at:

http://www.rohde-schwarz.com/product/SMBV100A.html > "Downloads"

Quick start guide
Introduces the R&S Signal Generator and describes how to set up and start working with the product. Includes basic operations, typical measurement examples, and general information, e.g. safety instructions, etc. A printed version is delivered with the instrument.

Online help
Offers quick, context-sensitive access to the complete information for the base unit and the software options directly on the instrument.

Operating manual
Separate manuals for the base unit and the software options are provided for download:

- Base unit manual
  Contains the description of all instrument modes and functions. It also provides an introduction to remote control, a complete description of the remote control commands with programming examples, and information on maintenance, instrument interfaces and error messages. Includes the contents of the quick start guide manual.

- Software option manual
  Contains the description of the specific functions of an option. Basic information on operating the R&S Signal Generator is not included.

The online version of the operating manual provides the complete contents for immediate display on the Internet.

Service manual
Describes the performance test for checking the rated specifications, module replacement and repair, firmware update, troubleshooting and fault elimination, and contains mechanical drawings and spare part lists.

The service manual is available for registered users on the global Rohde & Schwarz information system (GLORIS, https://gloris.rohde-schwarz.com).
Instrument security procedures manual
Deals with security issues when working with the R&S Signal Generator in secure areas.

Basic safety instructions
Contains safety instructions, operating conditions and further important information. The printed document is delivered with the instrument.

Data sheet and brochure
The data sheet contains the technical specifications of the software options, see "Digital Standards for Signal Generators - Data sheet" on the web site. It also lists the options and their order numbers.

The brochure provides an overview of the instrument and deals with the specific characteristics.

Release notes and open source acknowledgment (OSA)
The release notes of the base units list new features, improvements and known issues of the current firmware version, and describe the firmware installation.

The open source acknowledgment document provides verbatim license texts of the used open source software. See the product page of the base unit, e.g. at:
http://www.rohde-schwarz.com/product/SMBV100A.html > "Downloads" > "Firmware"

Application Notes, Application Cards, White Papers, etc.
These documents deal with special applications or background information on particular topics, see http://www.rohde-schwarz.com/appnotes.

1.2 Typographical Conventions

The following text markers are used throughout this documentation:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Graphical user interface elements&quot;</td>
<td>All names of graphical user interface elements on the screen, such as dialog boxes, menus, options, buttons, and softkeys are enclosed by quotation marks.</td>
</tr>
<tr>
<td>KEYS</td>
<td>Key names are written in capital letters.</td>
</tr>
<tr>
<td>File names, commands, program code</td>
<td>File names, commands, coding samples and screen output are distinguished by their font.</td>
</tr>
<tr>
<td>Input</td>
<td>Input to be entered by the user is displayed in italics.</td>
</tr>
</tbody>
</table>
1.3 Notes on Screenshots

When describing the functions of the product, we use sample screenshots. These screenshots are meant to illustrate as much as possible of the provided functions and possible interdependencies between parameters. The shown values may not represent realistic test situations.

The screenshots usually show a fully equipped product, that is: with all options installed. Thus, some functions shown in the screenshots may not be available in your particular product configuration.
2 Introduction

The R&S Signal Generator enables you to generate signals in accordance with the following standards:

- The United States Radio Broadcast Data System (RBDS) standard
- The European standard CENELEC EN50067 "Specification of the Radio Data System (RDS) for VHF FM sound broadcasting in the frequency range from 87.5 MHz to 108.0 MHz”.

The R&S Signal Generator simulates FM-Stereo signal at the physical layer. The following list gives an overview of the main options provided by the R&S Signal Generator for generating an FM-Stereo signal in accordance with the RDS/RBDS standard:

- Generation of standard compliant FM-Stereo signal with Stereo audio signal and RDS/RBDS signal
- Full configuration of all group types and versions
- Internal modulation sources from LF generator and wave file for digital stereo signal
- External modulation sources from digital S/P DIF interface for digital stereo signal
- In case of two path instrument, simulation of two independent FM radio transmitters
- Configuration of other networks and alternative frequency list

2.1 Modulation System FM-Stereo

Figure 2-1 shows the multiplex containing the data signal.

![Figure 2-1: FM baseband spectrum including RDS/RBDS subcarrier](image-url)
The radio frequency signal consists of a frequency modulated carrier with frequency of 19 kHz and maximum frequency deviation of 80 kHz.

The multiplex signal consists of the following:
- A mono signal
- The sidebands of the stereo signal with suppressed subcarrier at 38 kHz
- A pilot signal with exactly one half of the subcarrier frequency.

The mono signal M is the sum of the left-hand signal L and the right-hand signal R. The stereo signal S is the difference between the signals L and R. A preemphasis can be applied to both L and R signal before stereo coding.

The RDS/RBDS subcarrier is locked to the third harmonic of the 19 kHz pilot tone and suppressed.

The R&S Signal Generator enables you to configure the pilot's phase and frequency deviation, the RDS/RBDS subcarrier's phase and frequency deviation and the preemphasis. The pilot's phase and the RDS/RBDS subcarrier phase are set with respect to the 38 kHz subcarrier.

The figure below shows the FM-Stereo block diagram.

![Figure 2-2: FM-Stereo block diagram](image)

### 2.2 Baseband Coding and Group Structure

The figure below shows the baseband coding principle.
The basic element in the signal structure is the group. There are 16 groups (0 to 15) with 104 bits each. Each group consists of 4 blocks, 26 bits each. A block comprises an information word (16 bits) and a check word (10 bits).

Each group has two versions, version A and version B. The figure below shows the group structure for both versions.

**Figure 2-4: Version A and B group format**

The table below gives an overview of the available frame formats per group type and group type version. The frame format is displayed in the "RDS/RBDS User Message Table" dialog of the corresponding group type and group type version.

**Table 2-1: Frame formats per group type and group type version**

<table>
<thead>
<tr>
<th>Group Type</th>
<th>Frame format for group type version A</th>
<th>Frame format for group type version B</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group Type</td>
<td>Frame format for group type version A</td>
<td>Frame format for group type version B</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>2</td>
<td><img src="image1" alt="Frame format for group type version A" /></td>
<td><img src="image2" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>3</td>
<td><img src="image3" alt="Frame format for group type version A" /></td>
<td><img src="image4" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>4</td>
<td><img src="image5" alt="Frame format for group type version A" /></td>
<td><img src="image6" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>5</td>
<td><img src="image7" alt="Frame format for group type version A" /></td>
<td><img src="image8" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>6</td>
<td><img src="image9" alt="Frame format for group type version A" /></td>
<td><img src="image10" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>7</td>
<td><img src="image11" alt="Frame format for group type version A" /></td>
<td><img src="image12" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>8</td>
<td><img src="image13" alt="Frame format for group type version A" /></td>
<td><img src="image14" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>9</td>
<td><img src="image15" alt="Frame format for group type version A" /></td>
<td><img src="image16" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>10</td>
<td><img src="image17" alt="Frame format for group type version A" /></td>
<td><img src="image18" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>11</td>
<td><img src="image19" alt="Frame format for group type version A" /></td>
<td><img src="image20" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>12</td>
<td><img src="image21" alt="Frame format for group type version A" /></td>
<td><img src="image22" alt="Frame format for group type version B" /></td>
</tr>
<tr>
<td>Group Type</td>
<td>Frame format for group type version A</td>
<td>Frame format for group type version B</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>13</td>
<td><img src="image" alt="Frame format A" /></td>
<td><img src="image" alt="Frame format B" /></td>
</tr>
<tr>
<td>14</td>
<td><img src="image" alt="Frame format B" /></td>
<td><img src="image" alt="Frame format A" /></td>
</tr>
<tr>
<td>15</td>
<td><img src="image" alt="Frame format A" /></td>
<td><img src="image" alt="Frame format A" /></td>
</tr>
</tbody>
</table>

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3 FM-Stereo User Interface

The menu for setting the FM-Stereo digital standard is either called from the baseband block or from the menu tree under "Baseband."

The screenshots provided in this description show parameter values that have been selected to illustrate as much as possible of the provided functions and possible inter-dependencies between them.

These values are not necessarily representative of realistic test situations.

3.1 Main Settings

The menu is split into several sections for configuring the standard.

The upper menu section is where the FM-Stereo digital standard is activated and deactivated and the FM deviation is set. Configuration settings can be stored and already stored configuration settings can be loaded.

In the next two sections, the audio and stereo pilot tone settings are selected.
The buttons in the lower menu section lead to submenus for setting the trigger parameters and RDS/RBDS parameters.

### 3.1.1 General Settings

#### State
Activates the standard and deactivates all the other digital standards and digital modulation modes in the same path.

Remote command:
`[:SOURce<hw>]:BB:STEReo:STATe` on page 48

#### Set To Default
Calls the default settings. The values of the main parameters are listed in the following table.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Not affected by &quot;Set To Default&quot;</td>
</tr>
<tr>
<td>Deviation</td>
<td>67 500 Hz</td>
</tr>
<tr>
<td>Audio Source</td>
<td>Off</td>
</tr>
<tr>
<td>Audio Mode</td>
<td>Mono left</td>
</tr>
<tr>
<td>Audio Level</td>
<td>0 dBfs</td>
</tr>
<tr>
<td>Preemphasis</td>
<td>Off</td>
</tr>
<tr>
<td>Pilot state</td>
<td>On</td>
</tr>
<tr>
<td>Pilot Deviation</td>
<td>6750 Hz</td>
</tr>
<tr>
<td>Pilot Phase</td>
<td>0 deg</td>
</tr>
<tr>
<td>RDS/RBDS Configuration</td>
<td>On / 2.00 kHz / 0 deg</td>
</tr>
<tr>
<td>Trigger</td>
<td>Auto</td>
</tr>
<tr>
<td>Perform settings update</td>
<td>On</td>
</tr>
<tr>
<td>without signal interruption</td>
<td></td>
</tr>
</tbody>
</table>

Remote command:
`[:SOURce<hw>]:BB:STEReo:PRESet` on page 49

#### Save/Recall
Calls the "Save/Recall" menu.
From the "Save/Recall" menu, the "File Select" windows for saving and recalling FM-STEREO configurations and the "File Manager" is called.

FM-STEREO configurations are stored as files with the predefined file extension *.fm. The filename and the directory they are stored in are user-definable.

The complete settings in the "FM-STEREO" menu are saved and recalled.

"Recall FM-STEREO Setting"
- Opens the "File Select" window for loading a saved FM-STEREO configuration.
- The configuration of the selected (highlighted) file is loaded by pressing the "Select" button.

"Save FM-STEREO Setting"
- Opens the "File Select" window for saving the current FM-STEREO signal configuration.
- The name of the file is specified in the "Filename" entry field. The file is saved by pressing the Save button.

"File Manager"
- Calls the "File Manager".
- The "File Manager" is used to copy, delete, and rename files and to create directories.

Remote command:
- 

3.1.2 Audio Settings

In the "Audio Settings" section, the source for the audio signal and the preemphasis are selected.

**Deviation**
Sets the frequency deviation of the audio signal, i.e. the deviation of the mono signal M and the stereo signal S (see Figure 2-2).

Remote command:
- 

**Audio Source**
Selects the audio source for the FM-Stereo signal.

The sources cannot be used simultaneously.

"Off" The audio source is switched off.
"Extern S/P-DIF"
Activates the S/P-DIF input for the external digital modulation signals.
For R&S SMBV instruments:
Connect the audio source to the CLK IN connector on the rear panel.
For R&S SMU, R&S SMJ, R&S SMATE and R&S AMU instruments:
The audio source for path A/B has to be connected respectively to
the USER1/2 connector on the rear panel. The parameters "Map Out-
input Connector User 1 (BNC) / User 2 (AUX I/O) To" in the "User Marker/ AUS I/O" dialog have to be set to General Purpose Input.

Note: Applying audio signal to the S/P-DIF interface. For proper signal processing, the instrument requires an S/P-DIF source with input level of minimum 2.000 V and the following settings:

- "Extern Clock Source"
- "Global Trigger/Clock/External Inputs > Threshold Trigger/Control Input = 0.01V"
- "Global Trigger/Clock/External Inputs > Impedance Trigger/Control Input = 50 Ohm"

"LF-Generator"

The audio source is generated by the internal LF generator. The frequency of the LF generator is set with the parameter LF Generator Frequency.
"Waveform Audio File"

A *.wav file can be selected.
Audio files are selected in the Load Audio File dialog.

Remote command:
[:SOURce<hw>]:BB:STEReo:SOURce on page 51

External Clock

Sets the external clock (44.1 kHz or 48 kHz) in case an extern S/P-DIF audio source is selected.

Remote command:
[:SOURce<hw>]:BB:STEReo:AUDio:EXTClock on page 52

Load Audio File

Opens the "Load Audio File" dialog to select the *.wav file.

Remote command:
[:SOURce<hw>]:BB:STEReo:AUDio:DSELeCt on page 52

LF Generator Frequency

Sets the frequency of the LF generator in case a LF generator is selected as audio source.

Remote command:
[:SOURce<hw>]:BB:STEReo:AUDio[:FREQuency] on page 54

Audio Mode

Sets how the stereo audio source is mapped in case of mono or stereo operating mode.

"Left"
Audio signal only in the left-hand channel.

"Right"
Audio signal only in the right-hand channel.

"Stereo Left=Right"
Audio signal of same frequency and phase in both channels.
"Stereo Left=-Right"

Audio signal of same frequency but opposite phase in both channels.

This audio mode is not possible for "Audio Source > LF Generator".

"True Stereo"

Audio signal with true stereo quality, i.e. different and independent signals in both channels.

Remote command:
[:SOURce<hw>]:BB:STEReo:AUDio:MODE on page 53

Audio Level
Sets the level of the audio signal.
Remote command:
[:SOURce<hw>]:BB:STEReo:AUDio:LEVel on page 52

Preemphasis
Enables/disables and sets the preemphasis parameter value to 50 us or 75 us.
Remote command:
[:SOURce<hw>]:BB:STEReo:AUDio:PREemphasis on page 53

3.1.3 Stereo Pilot Tone Settings

Pilot State
Enables/disables the 19 kHz pilot tone.
Stereo operating mode is possible with enabled pilot tone only.
Remote command:
[:SOURce<hw>]:BB:STEReo:PILot:STATe on page 54

Pilot Deviation
Sets the frequency deviation of the pilot tone (see Figure 2-2).
The parameter is enabled only for enabled pilot tone.
Remote command:
[:SOURce<hw>]:BB:STEReo:PILot[:DEViation] on page 54

Pilot Phase
Sets the phase of the pilot tone (with respect to the 38 kHz subcarrier).
3.1.4 RDS/RBDS Parameters

RDS/RBDS Configurations
Calls the "RDS/RBDS Configurations" menu for configuring the RDS/RBDS. The currently selected RDS/RBDS parameters state, deviation and phase are displayed next to the button.

The menu is described in Chapter 3.2, "RDS/RBDS Configuration", on page 22.

Remote command:
\[:SOURce<hw>:BB:STEReo:PILot:PHASE\]
on page 54

Perform settings update without signal interruption
Sets how the FM signal is calculated in case of parameter update. If this parameter is enabled and some parameters are changed, these parameters are updated but the FM signal is not interrupted.

Disabling the parameter results in automatically recalculation of the FM signal after each parameter update. Recalculations disturb the pilot; resynchronize the receiver after recalculations.

Remote command:
\[:SOURce<hw>:BB:STEReo:PUWSint\]
on page 55

Trigger...
Calls the menu for selecting the trigger mode and trigger source, for configuring the marker signals, and for setting the time delay of an external trigger signal.

This menu is described in Chapter 3.7, "Trigger", on page 44.

The currently selected trigger mode and trigger source are displayed next to the button.

Remote command:
\[\text{n.a.}\]

3.2 RDS/RBDS Configuration

The "RDS/RBDS Configuration" menu allows you to configure the RDS/RBDS data.
**State**
Activates/deactivates RDS/RBDS function.
Remote command: `[:SOURce<hw>]:BB:STEReo:DS:STATe` on page 59

**Deviation**
Sets the frequency deviation of the RDS/RBDS subcarrier (see Figure 2-2).
Remote command: `[:SOURce<hw>]:BB:STEReo:DS:DEViation` on page 56

**Phase**
Selects the phase of the RDS/RBDS subcarrier (with respect to the 38 kHz subcarrier).
Remote command: `[:SOURce<hw>]:BB:STEReo:DS:PHASe` on page 58

**Data Rate**
Displays the RDS/RBDS data rate in Hz.
Remote command: `[:SOURce<hw>]:BB:STEReo:DS:DRATe?` on page 57

**Data Set**
Selects and activates the RDS/RBDS data set.

- "User-defined Groups" The RDS/RBDS parameters in the "RDS/RBDS Groups Message Settings" or in the "RDS/RBDS Group Hex Table" menu can be configured.

- "Group List" The RDS/RBDS parameters can be loaded from a group list file. "Group List" can be generated internally in the data editor by means of the "Save Groups" button in "RDS/RBDS Groups Message Settings" menu. The group lists files have to have an extension *.fm_gt*. Group lists are selected in the "Load Group List" window, which is called by means of the "Select Group List" button.
Groups Input Method
Selects the input format the RDS/RBDS parameters are represented for editing. There are two input formats: message format or hex table.
The parameter is enabled for data set "User-defined Groups" only.
Remote command:
[:SOURce<hw>]:BB:STEReo:DS:GIM on page 58

Standard
Selects the standard, RDS or RBDS, the signal is generated for.
Remote command:
[:SOURce<hw>]:BB:STEReo:DS:MODE on page 58

Edit User Group
Depending on the selection made for the parameter Groups Input Method, calls the "RDS/RBDS Groups Message Settings" menu or the "RDS/RBDS Group Hex Table" menu for configuring the RDS/RBDS parameters.
The parameter is enabled for data set "User-defined Groups" only.
The menus are described in sections Chapter 3.3.1, "General Settings", on page 25 and Chapter 3.6, "RDS/RBDS Group Hex Table", on page 42.
Remote command:
n.a.

Select Group List
(for "Data Set > Group List")
Calls the "Load Group List" menu for group file selection.
Remote command:
[:SOURce<hw>]:BB:STEReo:DS:DSET on page 57
[:SOURce<hw>]:BB:STEReo:DS:DSELeAct on page 57

3.3 RDS/RBDS Groups Message Settings
The "RDS/RBDS Settings" menu allows you to configure the RDS/RBDS parameters. The RDS/RBDS parameters are divided into common RDS/RBDS settings and group type specific settings.
3.3.1 General Settings

Set Groups to Default
Sets all group parameter values to the default settings.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:PRESet on page 81

Save Groups
Calls "Save Groups" menu for saving the settings to a file with extension *.fm_gt.
These files can be then loaded by means of the "Select Group List ..." button in the "RDS/RBDS Configuration" menu.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:STORe on page 81

3.3.2 Common Settings

Program Identification (PI)
Sets the parameter PI (Program Identification) in hex format.
The PI code is an international network identification. PI identifies the nation, the coverage area of the service and the radio network. PI can be used for automatically tuning and is transmitted in all the groups.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:CMNS:PI on page 62
Program Type (PTY) Number
Sets the program type number (see Table 3-1).
The PTY number identifies the content of the program.
PTY can be used for automatically tuning and is transmitted in all the groups.

Table 3-1: RDS/RBDS Program Types

<table>
<thead>
<tr>
<th>PTY Code</th>
<th>RDS Program Type</th>
<th>RBDS Program Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No program type or undefined</td>
<td>No program type or undefined</td>
</tr>
<tr>
<td>1</td>
<td>News</td>
<td>News</td>
</tr>
<tr>
<td>2</td>
<td>Current Affairs</td>
<td>Information</td>
</tr>
<tr>
<td>3</td>
<td>Information</td>
<td>Sports</td>
</tr>
<tr>
<td>4</td>
<td>Sports</td>
<td>Talk</td>
</tr>
<tr>
<td>5</td>
<td>Education</td>
<td>Rock</td>
</tr>
<tr>
<td>6</td>
<td>Drama</td>
<td>Classic Rock</td>
</tr>
<tr>
<td>7</td>
<td>Culture</td>
<td>Adult Hits</td>
</tr>
<tr>
<td>8</td>
<td>Science</td>
<td>Soft Rock</td>
</tr>
<tr>
<td>9</td>
<td>Varied</td>
<td>Top 40</td>
</tr>
<tr>
<td>10</td>
<td>Pop Music</td>
<td>Country</td>
</tr>
<tr>
<td>11</td>
<td>Rock Music</td>
<td>Oldies</td>
</tr>
<tr>
<td>12</td>
<td>M.O.R. Music</td>
<td>Soft</td>
</tr>
<tr>
<td>13</td>
<td>Light classical</td>
<td>Nostalgia</td>
</tr>
<tr>
<td>14</td>
<td>Serious classical</td>
<td>Jazz</td>
</tr>
<tr>
<td>15</td>
<td>Other Music</td>
<td>Classical</td>
</tr>
<tr>
<td>16</td>
<td>Weather</td>
<td>Rhythm and Blues</td>
</tr>
<tr>
<td>17</td>
<td>Finance</td>
<td>Soft Rhythm and Blues</td>
</tr>
<tr>
<td>18</td>
<td>Children's programs</td>
<td>Foreign Language</td>
</tr>
<tr>
<td>19</td>
<td>Social Affairs</td>
<td>Religious Music</td>
</tr>
<tr>
<td>20</td>
<td>Religion</td>
<td>Religious Talk</td>
</tr>
<tr>
<td>21</td>
<td>Phone In</td>
<td>Personality</td>
</tr>
<tr>
<td>22</td>
<td>Travel</td>
<td>Public</td>
</tr>
<tr>
<td>23</td>
<td>Leisure</td>
<td>College</td>
</tr>
<tr>
<td>24</td>
<td>Jazz Music</td>
<td>Unassigned</td>
</tr>
<tr>
<td>25</td>
<td>Country Music</td>
<td>Unassigned</td>
</tr>
<tr>
<td>26</td>
<td>National Music</td>
<td>Unassigned</td>
</tr>
<tr>
<td>27</td>
<td>Oldies Music</td>
<td>Unassigned</td>
</tr>
<tr>
<td>28</td>
<td>Folk Music</td>
<td>Unassigned</td>
</tr>
<tr>
<td>PTY Code</td>
<td>RDS Program Type</td>
<td>RBDS Program Type</td>
</tr>
<tr>
<td>----------</td>
<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>29</td>
<td>Documentary</td>
<td>Weather</td>
</tr>
<tr>
<td>30</td>
<td>Alarm Test</td>
<td>Emergency Test</td>
</tr>
<tr>
<td>31</td>
<td>Alarm</td>
<td>Emergency Test</td>
</tr>
</tbody>
</table>

Remote command:
```
[:SOURce<hw>]:BB:STEReo:GRPS:CMNS:PTY
```
on page 63

Program Type (PTY)
Displays the program type name of the selected PTY number (see Table 3-1).
Remote command:
```
n.a.
```

Traffic Program (TP)
Enables/ disables the traffic program. TP code identifies radio programs that continuously broadcast traffic information.
TP can be used for automatically tuning and is transmitted in all the groups.
Remote command:
```
[:SOURce<hw>]:BB:STEReo:GRPS:CMNS:TP
```
on page 63

### 3.3.3 Group Type 0A .. 15B Settings

The parameters in this section depend on the group type selected. To enable a group type for configuration, enable the corresponding parameter Do Conf. in the "Group Table".

The Table 3-2 gives an overview of the available RDS/RBDS group types.

**Table 3-2: RDS/RBDS group type codes**

<table>
<thead>
<tr>
<th>Group Type</th>
<th>Group Type Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>A</td>
<td>Basic tuning and switching information only</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Basic tuning and switching information only</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>Program Item Number and slow labeling codes only</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Program Item Number</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>Radio text only</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Radio text only</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>Applications Identification for ODA only</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Open Data Applications</td>
</tr>
<tr>
<td>4</td>
<td>A</td>
<td>Clock-time and date only</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Open Data Applications</td>
</tr>
<tr>
<td>5</td>
<td>A</td>
<td>Transparent Data Channels (32 channels) or ODA</td>
</tr>
</tbody>
</table>
Table 2-1 gives an overview of the available frame formats per group type and group type version. The frame format is displayed in the RDS/RBDS User Message Table dialog of the corresponding group type and group type version.

**Set to Default**
Resets the RDS/RBDS group-specific settings.

**Input Method**
Selects the format the corresponding group type 0 ..15 is represented for editing.

*"Standard"*  Configuration based on direct parameter input

*"User-defined"*  Allows configuration of the group type using a user-defined message

Remote command: 

```
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:INPMethod
```

on page 67
Group Type Version
Selects the group type version for the corresponding group type.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:VERSion on page 80

Text A/B Flag
(for "Group Type 2A/B")
Sets the "Text A/B Flag" to 0 (disabled parameter) or 1 (enabled parameter).
Each change of the state of the parameter (form 0 to 1 and from 1 to 0) triggers the receiver to clear the radio text and the program type name.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TABFlag on page 77

Radio Text
(for "Group Type 2A/2B")
Sets the radio text.
The radio text is maximum 64 characters long for group type 2A and maximum 32 characters for group type 2B.
If less than 64 respectively 32 characters are used, the unused positions are filled in with zeros (0x00).
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:RADText on page 75

A/B Flag
(Enabled for "Group Type 10A/B" only)
Sets the "A/B Flag" to 0 (disabled parameter) or 1 (enabled parameter).
Each change of the state of the parameter (form 0 to 1 and from 1 to 0) triggers the receiver to clear the radio text and the program type name.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:ABFLag on page 63

Program Type Name
(for "Group Type 10A")
Enters the program type name (max eight characters).
If fewer than eight characters are used, the unused positions are filled in with zeros (0x00).
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PTName on page 74

Extended Configuration - RDS/RBDS
(for "Input Method > Parameters")
Calls the "Group 0/4A/14/15B Extended Configuration" menu for configuring the RDS/RBDS parameters.
The menus are described in Chapter 3.4, "Extended Configuration", on page 31.
Edit User Message Table - RDS/RBDS
(For "Input Method > User Message Table")
Calls the "RDS/RBDS User Message Table - Group 0A .. 15B" menu for configuring
the RDS/RBDS user message parameters in hex format. The checkwords are calculat-
ted automatically.
The menus are described in Chapter 3.5, "RDS/RBDS User Message Table - Group
0A .. 15B", on page 41.

3.3.4 Group Table

The "Group Table" is located in the lower part of the menu.

Group
Displays the group type number.
Remote command:
n.a.

Type
Displays the group type version.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:VERSion on page 80

Tx Time
Sets the transmit time of the selected group. The transmit time is the group repetition
rate given as proportion.
The sum of the transmit times of all groups cannot exceed 100%. If the total transmit
time is less than 100%, during the rest of the transmit time zeros are transmitted.
Only groups with "State > On" are transmitted.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TTIMe on page 78

State
Enables/disables the transmission of the corresponding group type.
Only groups with "State > On" are transmitted.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:STATe on page 76

Do Conf
Enables/disables the corresponding group type for configuration. All editable parame-
ters are displayed in the menu section "Group Type 0A .. 15B" (see Chapter 3.5, "RDS/
RBDS User Message Table - Group 0A .. 15B", on page 41).
3.4 **Extended Configuration**

The menu "Extended Configuration" is enabled only for group types 0A, 0B, 4A, 14A, 14B and 15B.

3.4.1 **Group Type 0 - Extended Configuration**

The menu is separated into two sections, "Group Type" parameters and "Alternative Frequency List".

The "Alternative Frequency List" contains a group of maximum 25 frequencies. The list comprises the frequencies of the station of the same network that broadcast the same radio program within the geographical area concerned.

*Traffic Announcement*

Enables/disables broadcasting of traffic announcement. TA code indicates a traffic communication.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TA on page 77

**Music/Voice Switch**
Enables switching between speech and music transmission.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MVSWitch on page 71

**Decoder Identification (DI)**
Displays the decoder identification control code (DI) depending on the settings made for the parameter Dynamic PTY, Compressed, Artificial Head and Stereo

The DI is 4-bits long and identifies one of the 16 different operating modes of the decoder. The values of these 4 bits ($d_0$, $d_1$, $d_2$ and $d_3$) are set with the parameters "Stereo", "Artificial Head", "Compressed" and "Dynamic PTY" respectively.

**Example:**
SOUR:BB:STER:GRPS:GT0:DID:DPTY OFF
SOUR:BB:STER:GRPS:GT0:DID:COMP ON
SOUR:BB:STER:GRPS:GT0:DID:ARTH ON
SOUR:BB:STER:RDS:GT0:DID:STER OFF
SOUR:BB:STER:GRPS:GT0:DID:DATA?
Response: 0110

Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:DATA on page 66

**Dynamic PTY - DI**
Enables/disables dynamically PTY switching.
Disabled parameter corresponds to a static PTY and sets the $d_3$ bit of DI to 0; Dynamic PTY is indicated with 1.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:DPTY on page 67

**Compressed - DI**
Enables/disables the compressed bit of DI.
Disabled parameter sets the $d_2$ bit of DI to 0; enabled - to 1.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:COMPressed on page 66

**Artificial Head - DI**
Enables/disables using of Artificial Head.
Disabled parameter sets the $d_1$ bit of DI to 0; enabled - to 1.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:ARTHead on page 66
Stereo - DI
Sets the mono/stereo switch in the DI.
Disabled parameter corresponds to mono and sets the \( d_0 \) bit of DI to 0; Stereo is indicated with 1.
Remote command:
\[ [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:STEReo \] on page 67

Program Service Name
Enters the program service (PS) name. The PS name is displayed on the receiver and supplies the listener with the name of the radio station.
PS cannot be used for automatic search.
The default maximum length of PS is eight characters.
Remote command:
\[ [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PSName \] on page 73

No. Of Used Frequencies (Alternative Frequency List)
(for "Group Type Version A")
Sets the number of alternative frequencies to be configured. A maximal number of 25 AFs can be configured.
Remote command:
\[ [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:ALTF:NOENtries \] on page 65

Frequency/ MHz (Alternative Frequency List)
(for "Group Type Version A")
Sets the alternative frequency (AF) for the broadcast frequency.
The list of alternative frequencies give information on the various transmitters broadcasting the same program in the same or adjacent reception areas. It enables receivers equipped with a memory to store the list and to reduce the time for switching to another transmitter.
Remote command:
\[ [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:ALTF:DATA<ch0> \] on page 65

3.4.2 Group Type 4A - Extended Configuration

The "Group Type 4" dialog displays the clock time and date information.
**Date**  
Sets the date type to user date or system date.  
Remote command:  
[[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:DATE on page 65

**System Date**  
Displays the system date.  
Remote command:  
[[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:SYSDate on page 76

**User Date**  
Sets the user date in format DD.MM.YYYY.  
Remote command:  
[[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:USRDate on page 79

**Time**  
Sets the time type to system time or user time.  
Remote command:  
[[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:TIME on page 78

**System Time**  
Displays the system time.  
Remote command:  
[[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:SYSTime on page 76

**User Time**  
Sets the user time in format HH:MM.  
Remote command:  
[[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:USRTime on page 80

**Local Offset Time**  
(available for "User Time" only)  
Sets the local offset time expressed in multiples of half hours within the range -12h to +12h.  
The time is the sum of the user time and the local time offset.  
Remote command:  
[[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:LOTime on page 69

### 3.4.3 Group Type 14 - Extended Configuration

The dialog is separated into two sections. The first shows "Group Type" parameters and is always displayed. The second one is dynamic, where the parameters displayed depend on the selection made for the parameter **Information Block**.

The "Group Type 14" has two versions: A and B. The A version is the normal form and is used for the background transmission of Enhanced Other Networks information. The
B version of a type 14 group is used to indicate a change in the status of the TA flag of a cross-referenced program service.

The "Group Type 14 Version A" has 16 variants which can be used in any time mixture and order. Variant 4 (AF method A) and variants 5 to 9 (mapped frequency method) are defined for the transmission of frequencies of cross-referenced program services.

The Figure 3-1 shows the frame format of group type 14 version A, according to the RDS/RBDS standard.

### Figure 3-1: Frame format of group type 14A

Switching between the different variants is performed with the parameter "Information Block".

The Table 3-3 gives an overview of the cross-reference between the group type 14A variants and the content of the information block.

### Table 3-3: Information block content (group type 14A)

<table>
<thead>
<tr>
<th>Group type 14A variant</th>
<th>Information block</th>
</tr>
</thead>
<tbody>
<tr>
<td>0...3</td>
<td>PS (ON)</td>
</tr>
<tr>
<td>4</td>
<td>AF (ON)</td>
</tr>
<tr>
<td>5...8</td>
<td>Mapping between Tuning Freq. (TN) and mapped FM Freq. 0 to 3 (ON)</td>
</tr>
<tr>
<td>9</td>
<td>Mapping between Tuning Freq. (TN) and the mapped AM Freq. (ON)</td>
</tr>
<tr>
<td>10...11</td>
<td>Unallocated</td>
</tr>
<tr>
<td>12</td>
<td>Linkage information</td>
</tr>
<tr>
<td>13</td>
<td>PTY (ON), 10 reserved bits, TA (ON)</td>
</tr>
<tr>
<td>14</td>
<td>PIN (ON)</td>
</tr>
<tr>
<td>15</td>
<td>Reserved for broadcast use</td>
</tr>
</tbody>
</table>
3.4.3.1 Alternative Frequencies

Alternative frequencies are set in the "Alternative Frequency List". Method AF method A is configured with the parameters "Frequency (on)". The "Alternative Frequency List" contains a group of maximum 25 frequencies. The list comprises the frequencies of the stations of the other networks that broadcast the same radio program.

3.4.3.2 Mapped Frequencies

Mapped frequencies are set in the "Mapped Frequency List". The "Mapped Frequency List" sets the cross-reference between the frequency in the tuned network (Tuning Frequency (TN) / MHz) and the corresponding one or more frequencies in other network. The table allows a mapping to more than one VHF/FM frequency (Mapped Frequency (ON) 0 .. 3) and to one LF/MF frequency (mapped frequency (on) 4).

Program Identification (PI) - Other Networks (ON)

Sets the parameter Program Identification of other networks in hex format.

The PI code is an international network identification. PI identifies the nation, the coverage area of the service and the radio network. PI can be used for automatically tuning and is transmitted in all the groups.

Remote command:

`:SOURce<hw>:BB:STereo:GRPS:GT<st0>:PION` on page 73

Traffic Program (TP) - Other Networks (ON)

Enables/ disables the traffic program of other networks. TP code identifies radio programs that continuously broadcast traffic information.
Extended Configuration

Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TPON on page 78

Information Block
(for "Group Type Version A")

Sets the "Group Type 14A" variant codes. Depending on the selection made for this parameter; different additional parameters are displayed for configuration.

"Program Service"
Sets the content of "Information Block Variant Codes 0 to 3 - PS (ON)".

"AF"
Sets the content of "Information Block Variant Code 4 - Alternative Frequencies Method A".

"Mapped Frequency"
Sets the content of "Information Block Variant Codes 5 to 9 - Mapped Frequencies".

"Linkage Information"
Sets the content of "Information Block Variant Code 12 - Linkage Information".

"PTY/TA"
Sets the content of "Information Block Variant Code 13 - PTY (ON) and TA (ON)".

"PIN"
Sets the content of "Information Block Variant Code 14 - PIN (ON)".

Remote command:
.n.a.

State (Program Service) - Other Networks (ON)
(for "Group Type Version A" and "Information Block > Program Service")

Enables/disables sending of program service name of "Other Networks PS (ON)".

Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PSON:STATe on page 74

Program Service (PS) Name - Other Networks (ON)
(for "Group Type Version A" and "Information Block > Program Service")

Enters the program service name of other networks.
The PS name has a length of max eight characters. If fewer than eight characters are used, the unused positions are filled in with zeros (0x00).

Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PSON:PSName on page 73

State (Alternative Frequency)
(for "Group Type Version A" and "Information Block > AF")

Enables/disables using AF method A.

Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:AFON:STATe on page 64
No. Of Used Frequencies (Alternative Frequency List ON)
(for "Group Type Version A")
Sets the number of alternative frequency of other networks to be configured. A maximal number of 25 AFs can be configured.
Remote command:
[:SOURce<hw>]:BB:STereo:GRPS:GT<st0>:AFON:NOENtries on page 64

Frequency/ MHz (Alternative Frequency List ON)
(for "Group Type Version A")
Sets the alternative frequency (AF) of other networks for the broadcast frequency.
The list of alternative frequencies give information on the various transmitters of other networks broadcasting the same program in the same or adjacent reception areas. It enables receivers equipped with a memory to store the list and to reduce the time for switching to another transmitter.
Remote command:
[:SOURce<hw>]:BB:STereo:GRPS:GT<st0>:AFON:DATA<ch0> on page 63

State (Mapped Frequencies)
(for "Group Type Version A" and "Information Block > Mapped Frequencies")
Enables/disables using of mapped frequencies.
Remote command:
[:SOURce<hw>]:BB:STereo:GRPS:GT<st0>:MFL:STATe on page 71

No. Of Used Frequencies (Mapped Frequency List)
(for "Group Type Version A" and "Information Block > Mapped Frequencies")
Sets the number of mapped frequencies to be configured. A maximal number of five frequencies can be configured.
The mapped frequencies are the frequencies of other network that are cross-referenced to the frequencies in the tuned network. This cross-reference allows the transmission of several different services from the same transmitter with the same coverage area.
Remote command:
[:SOURce<hw>]:BB:STereo:GRPS:GT<st0>:MFL:NOENtries on page 71

Radio Band (Mapped Frequency List)
(for "Group Type Version A" and "Information Block > Mapped Frequencies")
Displays the radio band, AM or FM, used.
The first four frequencies (Frequency 0 to 3) are VHF/FM frequencies (FM); the last one (Frequency 4) is a LF/MF frequency (AM).
Remote command:
n.a.

Tuning Frequency (TN)/ MHz
(for "Group Type Version A" and "Information Block > Mapped Frequencies")
Sets the tuning frequency.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MFL:DATA<ch0>:TF on page 70

**Mapped Frequency (ON)/ MHz**
(for "Group Type Version A" and "Information Block > Mapped Frequencies")
Sets the FM/AM frequency.
Selected FM/AM frequency is mapped to the tuned frequency.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MFL:DATA<ch0>:MF on page 70

**State (Linkage Information)**
(for "Group Type Version A" and "Information Block > Linkage Information")
Enables/disables using of "Linkage Information (ON)".
Linkage information enables the receiver to treat several program services as a single service.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:STATE on page 69

**Linkage Actuator (LA)**
(for "Group Type Version A" and "Information Block > Linkage Information")
Enables/disables the linkage actuator LA for other networks.
Enabled LA corresponds to active link (LA=1), i.e. the program service is linked to the set of services, set with the Linkage Set Number (LSN).
Disabled LA corresponds to passive link (LA=0), i.e. the link is not active but becomes active in the feature.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:LA on page 68

**Extended Generic Indicator (EG)**
(for "Group Type Version A" and "Information Block > Linkage Information")
Enables/disables the extended generic indicator EG for other networks.
Enabled EG corresponds to EG=1, i.e. the program service is a member of an extended generic set.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:EG on page 67

**International Linkage Set Ind.**
(for "Group Type Version A" and "Information Block > Linkage Information")
Enables/disables the international linkage set indicator ILS for other networks.
Enabled ILS corresponds to international link (ILS=1).
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:ILS on page 68

**Linkage Set Number (LSN)**
(for "Group Type Version A" and "Information Block > Linkage Information")
Sets the Linkage Set Number LSN for other networks.
The LSN is a 12-bit number.
Remote command:

\[
[:\text{SOURce<hw>}:\text{BB:STEReo:GRPS:GT<st0>:LION:LSN} \text{ on page 68}
\]

**State (PTY/TA) - Other Networks (ON)**
(for "Group Type Version A" and "Information Block > PTY/TA")
Enables/disables using of PTY (ON) and TA (ON).
Remote command:

\[
[:\text{SOURce<hw>}:\text{BB:STEReo:GRPS:GT<st0>:PTYTa:STATe} \text{ on page 75}
\]

**Program Type (PTY) Number - Other Networks (ON)**
(for "Group Type Version A" and "Information Block > PTY/TA")
Sets the program type number of other networks (see Table 3-1).
Remote command:

\[
[:\text{SOURce<hw>}:\text{BB:STEReo:GRPS:GT<st0>:PTYTa:PTY} \text{ on page 74}
\]

**Traffic Announcement (TA) - Other Networks (ON)**
Enables/disables the traffic announcement (TA) of other networks. TA code indicates a traffic communication.
Remote command:

\[
[:\text{SOURce<hw>}:\text{BB:STEReo:GRPS:GT<st0>:TAON} \text{ on page 77}
\]

**State (PIN) - Other Networks (ON)**
(for "Group Type Version A" and "Information Block > PIN")
Enables/disables using of PIN (ON).
Remote command:

\[
[:\text{SOURce<hw>}:\text{BB:STEReo:GRPS:GT<st0>:PINon:STATe} \text{ on page 72}
\]

**Program Item Number (PIN) - Other Networks (ON)**
(for "Group Type Version A" and "Information Block > PIN")
Enters the program item number (PIN) of other networks.
The transmitted Program Item Number code is the scheduled broadcast start time and day of month as published by the broadcaster.
Remote command:

\[
[:\text{SOURce<hw>}:\text{BB:STEReo:GRPS:GT<st0>:PINon:PIN} \text{ on page 72}
\]

### 3.4.4 Group Type 15 - Extended Configuration

The "Group Type 15" dialog displays the basic tuning and switching information, as selected for group type 0.
Traffic Announcement
Enables/disables broadcasting of traffic announcement. TA code indicates a traffic communication.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TA on page 77

Music/Voice Switch
Enables switching between speech and music transmission.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MVSWitch on page 71

Decoder Identification (DI)
(enabled for group type version B only)
Displays the current decoder operating mode (mono, stereo, etc.) as selected for group type 0.
Remote command:
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:DATA on page 66

3.5 RDS/RBDS User Message Table - Group 0A .. 15B

The "RDS/RBDS User Message" table allows direct configuration of the user message in hex format (see also Chapter 2.2, “Baseband Coding and Group Structure”, on page 10).

Depending on the selected “Group Type” and “Group Type Version”, the frame format is displayed.

**No. Of Message Entries (User Message Table)**
Sets the number of transmitted groups per message. A maximal number of 32 groups can be configured.
3.6 RDS/RBDS Group Hex Table

Alternatively to selecting RDS/RBDS parameters, the RDS/RBDS message blocks can be directly configured in hex format.
No.
Displays the group hex table row number.

Block 1 .. 4 (Group Hex Table)
Sets the hex value for the "Block 1 to 4" of the corresponding group hex table row.
Remote command:
\[
[:\text{SOURce<hw>:BB:STEReo:GHEX:DATA<ch0>:BLOCk<st}> on page 60
\]

Preset Hex Table
Presets the group hex table.
Remote command:
\[
[:\text{SOURce<hw>:BB:STEReo:GHEX:PRESet on page 60
\]

Load Hex Data
Opens the "Load Group Hex Data" dialog for loading of group lists files in hex formal. The hex file is generated externally and has to have an extension ".fm_ghex".
A group list file in hex format is a file with extension ".fm_ghex" and the following format:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GroupTypeXXX</td>
<td>Group type and group type version, where XXX=00A, 00B, to 15A, 15B</td>
</tr>
<tr>
<td>:</td>
<td>Separator between the group type and the data blocks</td>
</tr>
<tr>
<td>0xNNNNNNNNN</td>
<td>where: 0x indicates the data format (hex format) and NNNNNNNN is the 26-bit long data per block, i.e. the information word and the checkword + offset word.</td>
</tr>
</tbody>
</table>
The figure below gives an example of group list file in hex format.

```
// Type Block 1 Block 2 Block 3 Block 4
// ----------------------------------------------------
// Group type: W 0x00 0x134567 0x123567 0x345678 // Comment
// Group type: C 0x00 0x134567 0x123567 0x345678 // Comment
// Group type: D 0x00 0x134567 0x123567 0x345678 // Comment
// Group type: A 0x00 0x134567 0x123567 0x345678 // Comment
// Group type: B 0x00 0x134567 0x123567 0x345678 // Comment
// Group type: E 0x00 0x134567 0x123567 0x345678 // Comment
// Group type: F 0x00 0x134567 0x123567 0x345678 // Comment
// Group type: G 0x00 0x134567 0x123567 0x345678 // Comment
// Group type: H 0x00 0x134567 0x123567 0x345678 // Comment
```

Remote command:
```
[:SOURce<hw>]:BB:STEReo:GHEX:LOAD
```
on page 60

**Used Entries**

Sets the number of messages to be configured. A maximal number of 64 messages can be configured.

Remote command:
```
[:SOURce<hw>]:BB:STEReo:GHEX:NOENtries
```
on page 60

### 3.7 Trigger

To access this dialog, select "Main Menu > Trigger/Marker".

The "Trigger In" section is where the trigger for the signal is set. The status of signal generation ("Running" or "Stopped") is indicated.

The buttons in the last section lead to submenu for general trigger, clock and mapping settings.

### 3.7.1 Trigger In

The "Trigger In" section is where the trigger for the signal is set.
The status of signal generation ("Running" or "Stopped") is indicated for all trigger modes.

**Trigger Mode**
Selects trigger mode.

The trigger mode determines the effect of a trigger on the signal generation.

- "Auto"  
  The signal is generated continuously.

Remote command:
[:SOURce<hw>]:BB:STEReo[:TRIGger]:SEQuence on page 56

**Running/Stopped**
Displays the status of signal generation for all trigger modes. This display appears only when signal generation is enabled.

- "Running"  
  The modulation signal is generated; a trigger was (internally or externally) initiated in triggered mode.

- "Stopped"  
  The signal is not generated, and the instrument waits for a trigger event (internal or external).

Remote command:
[:SOURce<hw>]:BB:STEReo:TRIGger:RMODe on page 55

### 3.7.2 Global Settings

The buttons in this section lead to dialogs for general trigger, clock and mapping settings.

**Global Trigger/Clock Settings**
Calls the "Global Trigger/Clock/Input Settings" dialog.

This dialog is used among other things for setting the trigger threshold, the input impedance and the polarity of the clock and trigger inputs.

The parameters in this dialog affect all digital modulations and standards, and are described in chapter "Global Trigger/Clock/Input Settings" in the Operating Manual.

**User Marker / AUX I/O Settings**
Calls the "User Marker AUX I/O Settings" dialog, used to map the connector on the rear of the instruments.

See also "User Marker / AUX I/O Settings" in the Operating Manual.
4 Remote-Control Commands

The following commands are required to perform signal generation with the FM-Stereo/RDS options in a remote environment. We assume that the R&S Signal Generator has already been set up for remote operation in a network as described in the R&S Signal Generator documentation. A knowledge about the remote control operation and the SCPI command syntax are assumed.

Conventions used in SCPI command descriptions

For a description of the conventions used in the remote command descriptions, see section “Remote Control Commands” in the R&S Signal Generator operating manual.

Common suffixes

The following common suffixes are used in remote commands:

<table>
<thead>
<tr>
<th>Suffix</th>
<th>Value range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOURce&lt;hw&gt;</td>
<td>[1]</td>
<td>2</td>
</tr>
<tr>
<td>OUTPut&lt;ch&gt;</td>
<td>1 .. 4</td>
<td>available markers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R&amp;S SMBV supports two markers</td>
</tr>
<tr>
<td>EXTernal&lt;ch&gt;</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Placeholder <root>

For commands that read out or save files in the default directory, the default directory is set using command MMEM:CDIrectory. The examples in this description use the placeholder <root> in the syntax of the command.

- D:\ - for selecting the internal hard disk of a Windows instrument
- E:\ - for selecting the memory stick which is inserted at the USB interface of a Windows instrument
- /var/user/ - for selecting the internal flash card of a Linux instrument
- /usb/ - for selecting the memory stick which is inserted at the USB interface of a Linux instrument.
Tasks (in manual or remote operation) that are also performed in the base unit in the same way are not described here.

In particular, this includes:

- Managing settings and data lists, i.e. storing and loading settings, creating and accessing data lists, accessing files in a particular directory, etc.
- Information on regular trigger, marker and clock signals as well as filter settings, if appropriate.
- General instrument configuration, such as configuring networks and remote operation
- Using the common status registers

For a description of such tasks, see the R&S Signal Generator operating manual.

The following commands specific to the SOURce:BB:STEReo subsystem are described here:

### 4.1 Primary Commands

- [:SOURce<hw>]:BB:STEReo:STATe
- [:SOURce<hw>]:BB:STEReo:PRESet
- [:SOURce<hw>]:BB:STEReo:SETTing:CATalog?
- [:SOURce<hw>]:BB:STEReo:SETTing:LOAD
- [:SOURce<hw>]:BB:STEReo:SETTing:STORe
- [:SOURce<hw>]:BB:STEReo:SETTing:STORe:FAST
- [:SOURce<hw>]:BB:STEReo:DEViation
- [:SOURce<hw>]:BB:STEReo:SOURce
- [:SOURce<hw>]:BB:STEReo:AUDio:CATalog?
- [:SOURce<hw>]:BB:STEReo:AUDio:DSELect
- [:SOURce<hw>]:BB:STEReo:AUDio:EXTClock
- [:SOURce<hw>]:BB:STEReo:AUDio:LEVel
- [:SOURce<hw>]:BB:STEReo:AUDio:MODE
- [:SOURce<hw>]:BB:STEReo:AUDio:PREemphasis
- [:SOURce<hw>]:BB:STEReo:AUDio:[FREQuency]
- [:SOURce<hw>]:BB:STEReo:PILot:PHASe
- [:SOURce<hw>]:BB:STEReo:PILot:PHASE
- [:SOURce<hw>]:BB:STEReo:PILot:STATe
- [:SOURce<hw>]:BB:STEReo:PILot:[DEViation]
- [:SOURce<hw>]:BB:STEReo:PUWSint
- [:SOURce<hw>]:BB:STEReo:TRIGger:RMODE
- [:SOURce<hw>]:BB:STEReo:[TRIGger]:SEQUence

[:SOURce<hw>]:BB:STEReo:STATe <State>

Activates the standard and deactivates all the other digital standards and digital modulation modes in the same path.
Parameters:

**<State>**

| 0 | 1 | OFF | ON |

*RST:* 0

Example: SOURcel:BB:STEReo:STATe ON

Manual operation: See "State" on page 16

**[:SOURce<hw>]:BB:STEReo:PRESet**

Sets the parameters of the digital standard to their default values (*RST values specified for the commands).

Not affected is the state set with the command SOURce<hw>:BB:STEReo:STATe.

Example: SOURcel:BB:STEReo:PRESet

Usage: Event

Manual operation: See "Set To Default" on page 16

**[:SOURce<hw>]:BB:STEReo:SETTing:CATalog?**

Reads out the files with FM-STEREO settings in the default directory.

The directory is set using command MMEM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. The file extension can be omitted. Only files with the file extension *.*.fm are listed.

Return values:

| <Catalog> | string |

Example: MMEM:CDIR '<root>FMSTereo'

Sets the default directory

SOUR:BB:STER:SETT:CAT?

Reads out all the files with FM Stereo settings in the default directory

Response: fm_stereo1, fm_stereo 2

Usage: Query only

Manual operation: See "Save/Recall" on page 16

**[:SOURce<hw>]:BB:STEReo:SETTing:LOAD <Load>**

 Loads the selected file with FM Stereo settings.

The directory is set using command MMEM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. The file extension can be omitted. Only files with the file extension *.*.fm are loaded.

Setting parameters:

| <Load> | string |
Example: SOUR:BB:STER:SETT:LOAD 'fm_configuration1'
Loads the file fm_configuration1.fm

Usage: Setting only

Manual operation: See "Save/Recall" on page 16

[:SOURce<hw>]:BB:STEReo:SETTing:STORe <Store>
Stores the selected file with FM-STEREO settings.

The directory is set using command MMEM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. The file extension can be omitted. FM-STEREO settings are stored as files with the specific file extension *.fm.

Setting parameters:
<Store> string

Example: SOUR:BB:STER:SETT:STOR 'fm_configuration1'
Stores the current setting

Usage: Setting only

Manual operation: See "Save/Recall" on page 16

[:SOURce<hw>]:BB:STEReo:SETTing:STORe:FAST <Fast>
Determines whether the instrument performs an absolute or a differential storing of the settings.

Enable this function to accelerate the saving process by saving only the settings with values different to the default ones.

Note: This function is not affected by the "Preset" function.

Parameters:
<Fast> 0 | 1 | OFF | ON
*RST: 0

[:SOURce<hw>]:BB:STEReo:DEViation <Deviation>
Sets the frequency deviation of the stereo signal.

Parameters:
<Deviation> integer
Range: 0 to 80000
Increment: 10
*RST: 67500

Example: SOURce:BB:STER:DEV 70000
sets the deviation value 70kHz

Manual operation: See "Deviation" on page 17
[:SOURce<hw>]:BB:STEReo:SOURce <Source>

Selects the audio source for the FM-Stereo signal.
The sources cannot be used simultaneously.

Parameters:

<Source> OFF | SPEXt | LFGen | FILE

OFF
The audio source is switched off.

SPEXt
Activates the S/P-DIF input for the external digital modulation signals.
For R&S SMU/SMJ/SMATE and R&S AMU instruments:
The audio source for path A/B has to be connected respectively
to the USER1/2 connector on the rear panel.
For R&S SMBV instrument:
Connect the audio source to the MARKER connector on the rear panel.

Note: In case an audio signal is applied to the S/P-DIF interface,
select an "Extern Clock Source" and set the parameter "Threshold Trigger/Control Input" to 0.01 V.

LFGen
The audio source is generated by the internal LF generator.
The frequency of the LF generator is set with the command [:SOURce<hw>]:BB:STEReo:AUDio[:FREQuency].

FILE
A *.wav file can be selected. Audio files are selected with the command [:SOURce<hw>]:BB:STEReo:AUDio:DSELect

*RST: OFF

Example:
SOUR:BB:STER:SOUR LFG
Selects the audio source
SOUR:BB:STER:AUD:FREQ 1000
Sets the LF generator frequency

Manual operation: See "Audio Source" on page 17

[:SOURce<hw>]:BB:STEReo:AUDio:CATalog?

Reads out the Waveform files in the default directory.
The directory is set using command MMEM:CDIrectory. A path can also be specified,
in which case the files in the specified directory are read. The file extension can be omitted. Only files with the file extension *.wav are listed.

Return values:

<Catalog> string
Remote-Control Commands

Example:

```
MMEM:CDIR '<root>FMStereo'
Sets the default directory
SOUR:BB:STER:AUD:CAT?
Reads out all the waveform files in the default directory
Response: fm_stereo_waveform1,
          fm_stereo_waveform2
```

Usage:
Query only

```
[:SOURce<hw>]:BB:STEReo:AUDio:DSElect <DSelect>
```

Loads the selected file with audio data. The file extension can be omitted. Only files with the file extension `.wav` are loaded.

Setting parameters:

```
<DSelect> string
```

Example:

```
SOUR:BB:STER:SOUR FILE
Selects the audio source
MMEM:CDIR '<root>waveforms'
Sets the default directory
SOUR:BB:STER:AUD:DSEL 'fm_wave'
Loads the audio file fm_wave.wav from the default directory
```

Usage:
Setting only

Manual operation: See "Load Audio File" on page 20

```
[:SOURce<hw>]:BB:STEReo:AUDio:EXTClock <ExtClock>
```

Sets the external clock (44.1 kHz or 48 kHz) in case an extern S/P-DIF audio source is selected.

Parameters:

```
<ExtClock> 44100 | 48000
*RST: 44100
```

Example:

```
SOUR:BB:STER:SOUR SPEX
Selects the audio source
SOUR:BB:STER:AUD:EXTC 48000
Sets the external clock to 48 kHz
```

Manual operation: See "External Clock" on page 20

```
[:SOURce<hw>]:BB:STEReo:AUDio:LEVel <Level>
```

Sets the level of the audio signal.
Remote-Control Commands

Parameters:

<Level>
float
Range: -30 to 10
Increment: 0.01
*RST: 0
Default unit: dBfs

Example:
SOUR:BB:STER:AUD:LEV -10.00
Sets the audio level –10dBFS

Manual operation: See "Audio Level" on page 21

[:SOURce<hw>]:BB:STEReo:AUDio:MODE <Mode>
Selects the operating mode.

Parameters:

<Mode>
LEFT | RIGHT | RELeft | REMLeft | RNELeft
LEFT
Audio signal only in the left-hand channel
RIGHT
Audio signal only in the left-hand channel
RELleft
Audio signals of the same frequency and phase in both channels
REMleft
Audio signals of same frequency but opposite phase in both channels
(not possible with source selection LF Generator)
RNEleft
Different and independent audio signals in both channels
*RST: LEFT

Example:
SOUR:BB:STER:AUD:MODE RNE
sets the audio mode to true stereo

Manual operation: See "Audio Mode" on page 20

[:SOURce<hw>]:BB:STEReo:AUDio:PREemphasish <PreEmphasis>
Enables/disables and sets the preemphasis parameter value to 50us or 75us.

Parameters:

<PreEmphasis>
OFF | 50 | 75
*RST: OFF

Example:
SOUR:BB:STER:AUD:PRE 50
Sets the preemphasis to 50 us

Manual operation: See "Preemphasis" on page 21
[:SOURce<hw>]:BB:STEReo:AUDio[:FREQuency] <Frequency>

Sets the frequency of the LF-Generator in case a LF-Generator is selected as audio source.

**Parameters:**

- **<Frequency>**
  - Type: float
  - Range: 20 to 15000
  - Increment: 0.01
  - *RST: 1000

**Example:**

```
SOUR:BB:STER:SOUR LFG
selects the audio source
SOUR:BB:STER:AUD:FREQ 1000
sets the LF Generator Frequency to 1 kHz
```

**Manual operation:** See "LF Generator Frequency" on page 20

---

[:SOURce<hw>]:BB:STEReo:PILot:PHASe <Phase>

Sets the phase of the pilot tone (with respect to the 38 kHz subcarrier). The parameter is enabled only for enabled pilot tone.

**Parameters:**

- **<Phase>**
  - Type: float
  - Range: -50 to 50
  - Increment: 0.1
  - *RST: 0

**Example:**

```
SOUR:BB:STER:PIL:PHAS -3
sets the phase to 3 degrees
```

**Manual operation:** See "Pilot Phase" on page 21

---

[:SOURce<hw>]:BB:STEReo:PILot:STATe <State>

Enables/disables the pilot tone.

Stereo operating mode is possible with enabled pilot tone only.

**Parameters:**

- **<State>**
  - 0 | 1 | OFF | ON
  - *RST: ON

**Example:**

```
SOUR:BB:STER:PIL:STAT ON
enables pilot tone
```

**Manual operation:** See "Pilot State" on page 21

---

[:SOURce<hw>]:BB:STEReo:PILot[:DEViation] <Deviation>

Sets the frequency deviation of the pilot tone. The parameter is enabled only for enabled pilot tone.
Parameters:
<Deviation> integer
Range: 0 to 10000
Increment: 10
*RST: 6750
Example: SOUR:BB:PIL:DEV 5000
sets the deviation of the pilot tone to 5 kHz
Manual operation: See "Pilot Deviation" on page 21

[:SOURce<hw>:]BB:STEReo:PUWSint <PUWS>
Sets how the FM signal is calculated in case of parameter update.

If this parameter is enabled and some parameters are changed, these parameters are updated but the FM signal is not interrupted.

Disabling the parameter results in automatically recalculation of the FM signal after each parameter update. This disturbs the pilot. Resynchronize the receiver.

Parameters:
<PUWS> 0 | 1 | OFF | ON
*RST: 1
Example: SOUR:BB:STER:PUWS 1
Enables FM Stereo signal generation without interruption
Manual operation: See "Perform settings update without signal interruption" on page 22

[:SOURce<hw>:]BB:STEReo:TRIGger:RMODe <RMode>
The command queries the status of signal generation for all trigger modes with FM Stereo modulation on.

Parameters:
<RMode> STOP | RUN
RUN The signal is generated. A trigger event occurred in the triggered mode.
STOP The signal is not generated.
*RST: STOP
Example: BB:STER:TRIG:RMOD?
Queries the status of signal generation.
Response: RUN
The signal is generated
Manual operation: See "Running/Stopped" on page 45
[:SOURce<hw>]:BB:STEReo[:TRIGger]:SEQUence <Sequence>

Sets the trigger mode.

Parameters:

<Sequence>        AUTO

AUTO
The modulation signal is generated continuously.

*RST: AUTO

Example: BB:STER:SEQ AUTO
sets the Auto trigger mode

Manual operation: See "Trigger Mode" on page 45

4.2 RDS/RBDS Configurations

[:SOURce<hw>]:BB:STEReo:DS:CATalog?

Reads out the files with the group list settings in the default directory.

The directory is set using command MMM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. The file extension can be omitted. Only files with the file extension * .fm_gt are listed.

Return values:

<string>

Example: MMEM:CDIR \'<root>FMStereo\'
Sets the default directory
SOUR:BB:STER:DS:CAT?
Reads out all the files with group lists settings in the default directory
Response: fm_stereo_GL1, fm_stereo_GL2

Usage: Query only

[:SOURce<hw>]:BB:STEReo:DS:DEViation <Deviation>

Sets the frequency deviation of the RDS/RDBS subcarrier.
Parameters:
<Deviation> integer
Range: 0 to 10000
Increment: 50
*RST: 2000

Example: SOUR:BB:STER:DS:DEV 5000
sets the deviation to 5 kHz

Manual operation: See "Deviation" on page 23

[:SOURCE<hw>]:BB:STEReo:DS:DRATe?
Queries the data rate.

Return values:
<DRate> float
Range: 1187.5 to 1187.5
Increment: 0.1
*RST: 1187.5

Example: SOUR:BB:STER:DS:DRATe?
queries the data rate
Response: 1187.5

Usage: Query only
Manual operation: See "Data Rate" on page 23

[:SOURCE<hw>]:BB:STEReo:DS:DSELect <DSelect>
Selects the group list.

Setting parameters:
<DSelect> string

Example: BB:STER:DS:DSET GRPL
selects group lists
BB:STER:DS:DSEL 'fm_group_list'
selects the group list file

Usage: Setting only
Manual operation: See "Data Set" on page 23

[:SOURCE<hw>]:BB:STEReo:DS:DSET <DSet>
Selects and activates the RDS/RBDS data set.
Parameters:  
<DSet> UDGRoups | GRPList  
UDGRoups  
User-defined Groups  
GRPList  
The RDS/RBDS parameters are loaded from group lists files  
*RST: UDGRoups  
Example:  
BB:STEReo:DS:DSET GRPL  
Selects group list files  
Manual operation: See “Data Set” on page 23

[:SOURce<hw>]:BB:STEReo:DS:GIN <Gim>  
Sets the input method.  
Parameters:  
<Gim> MSGFormat | HEXFormat  
MSGFormat  
Message Format  
HEXFormat  
Hex Format  
*RST: MSGFormat  
Example:  
BB:STEReo:DS:GIN HEXF  
Selects the group input method Hex Format  
Manual operation: See “Groups Input Method” on page 24

[:SOURce<hw>]:BB:STEReo:DS:MODE <Mode>  
Selects the standard, RDS (Radio Data System) or RBDS (Radio Broadcast Data System), the signal is generated for.  
Parameters:  
<Mode> RDS | RBDS  
*RST: RDS  
Example:  
SOUR:BB:STER:DS:MODE RBDS  
selects the Radio Broadcast Data System.  
Manual operation: See “Standard” on page 24

[:SOURce<hw>]:BB:STEReo:DS:PHASe <Phase>  
Selects the phase of the RDS/RBDS subcarrier (with respect to the 38 kHz subcarrier).
Parameters:

<Phase>  
float  
Range: 0 to 359.9  
Increment: 0.1  
*RST: 0  

Example: SOUR:BB:STER:DS:PHAse 10.1  
sets a phase of 10.1 degrees.  

Manual operation: See "Phase" on page 23  

[:SOURce<hw>]:BB:STEReo:DS:STATe <State>  
Activates/deactivates RDS/RBDS function.  

Parameters:  

<State>  
0 | 1 | OFF | ON  
*RST: ON  

Example: SOUR:BB:STER:DS:STAT ON  
activates the RDS/RBDS function  

Manual operation: See "State" on page 23  

4.3 Group Hex Settings  

[:SOURce<hw>]:BB:STEReo:GHEX:CATalog?  
Reads out the files in hex format with the group list settings in the default directory.  
The directory is set using command MMEM:CDIRectory. A path can also be specified,  
in which case the files in the specified directory are read. The file extension can be  
 omitted. Only files with the file extension *.fm_ghex are listed.  

Return values:  

<String>  

Example: MMEM:CDIR '<root>FMStereo'  
Sets the default directory  
SOUR:BB:STER:GHEX:CAT?  
Reads out all the files in hex format with group lists settings in  
the default directory  
Response: fm_stereo_GL_hex1, fm_stereo_GL_hex2
**Usage:** Query only

`:SOURce<hw>]:BB:STEReo:GHEX:DATA<ch0>:BLOCk<st> <Block>`

Sets the block data.

**Parameters:**

<table>
<thead>
<tr>
<th>&lt;Block&gt;</th>
<th>integer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range:</td>
<td>0 to #H3FFFFFF</td>
</tr>
<tr>
<td>*RST:</td>
<td>0</td>
</tr>
</tbody>
</table>

**Example:**

`SOUR:BB:STER:GHEX:DATA:BLOCK2 #HA6BE`  
sets the hex value #HA6BE for block 3 at group hex row index 2.

**Manual operation:** See "Block 1 .. 4 (Group Hex Table)" on page 43

`[:SOURce<hw>]:BB:STEReo:GHEX:LOAD <Load>`

Loads the selected file with group hex settings.

The directory is set using command `MMEM:CDIRectory`. A path can also be specified, in which case the files in the specified directory are read. The file extension can be omitted. Only files with the file extension `.fm_ghex` are loaded.

**Setting parameters:**

<table>
<thead>
<tr>
<th>&lt;Load&gt;</th>
<th>string</th>
</tr>
</thead>
</table>

**Example:**

`SOUR:BB:STER:GHEX:LOAD 'fm_stereo_GL_hex1'`  
Loads the file `fm_stereo_GL_hex1.fm`

**Usage:** Setting only

**Manual operation:** See "Load Hex Data" on page 43

`[:SOURce<hw>]:BB:STEReo:GHEX:NOENtries <NoEntries>`

Sets the number of used group hex entries.

**Parameters:**

<table>
<thead>
<tr>
<th>&lt;NoEntries&gt;</th>
<th>integer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range:</td>
<td>1 to 64</td>
</tr>
<tr>
<td>*RST:</td>
<td>1</td>
</tr>
</tbody>
</table>

**Example:**

`SOUR:BB:STER:GHEX:NOEN 5`  
selects 3 used group hex entries for signal generation

**Manual operation:** See "Used Entries" on page 44

`[:SOURce<hw>]:BB:STEReo:GHEX:PRESet`  
Resets the group hex table.

**Example:**

`SOURce1:BB:STEReo:GHEX:PRESet`
4.4 RDS/RBDS Group Settings

[:SOURce<hw>]:BB:STEReo:GRPS:AGPReset .................................................. 62
[:SOURce<hw>]:BB:STEReo:GRPS:CMNS.PI ......................................................... 62
[:SOURce<hw>]:BB:STEReo:GRPS:CMNS.PTY ......................................................... 63
[:SOURce<hw>]:BB:STEReo:GRPS:CMNS.TP ......................................................... 63
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:ABFlag .................................................. 63
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:AFON:DATA<ch0> .................................... 63
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:AFON:NOENtries .................................... 64
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:AFON:STATE ........................................ 64
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:ALTF:DATA<ch0> .................................... 65
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:ALTF:NOENtries .................................... 65
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DATE .................................................. 65
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:ARTHead ........................................ 66
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:COMPRESSED ................................... 66
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:DATA ............................................... 66
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:DPTY ................................................ 67
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:STEReo ........................................... 67
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:INPMETHOD ........................................... 67
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:EG ................................................ 67
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:ILS ............................................... 68
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:LA ............................................... 68
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:LSN ............................................. 68
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:STATE .......................................... 69
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LOTIME ................................................ 69
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MFL:DATA<ch0>:MF .................................. 70
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MFL:DATA<ch0>:TF .................................. 70
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MFL:NOENtries ....................................... 71
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MFL:STATE ............................................ 71
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MVSWITCH ............................................. 71
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PINNon:PIN .......................................... 72

Stores the current RDS/RBDS Group Hex Settings into the selected file. The directory is set using command MMEM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. Only enter the file name.

Setting parameters:
<Store> <file name>

Example: SOUR:BB:STER:GHEX:STOR 'fm_groups'
Saves the RDS/RBDS Group Hex Settings into the file
Remote-Control Commands

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PNon:STATe

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PION

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PSName

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PSON:PSName

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PSON:STATe

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PTName

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PTYTa:PTY

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PTYTa:STATe

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PTYTa:TA

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:RADText

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:STATe

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:SYSDate

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:SYSTime

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TA

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TABFlag

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TAON

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TIME

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TPON

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TTIMe

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:UMT:DATA<ch0>:BLOCk<user>

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:UMT:NOENtries

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:USRDate

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:USRTime

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:VERSion

[:SOURce<hw>]:BB:STEReo:GRPS:PRESet

[:SOURce<hw>]:BB:STEReo:GRPS:STORe

[:SOURce<hw>]:BB:STEReo:GRPS:AGPReset

Sets the parameter values of the active group to the default settings.

Example:

Sets the active group to default

Usage:

Event

[:SOURce<hw>]:BB:STEReo:GRPS:CMNS:PI <Pi>

Sets the parameter PI (Program Identification). The input format is hex format or decimal format with 4 symbols length.

Parameters:

<Pi>

integer

Range: 0 to #HFFFF

*RST: #HD238

Example:

SOUR:BB:STER:GRPS:CMNS:PI #HAB18

sets the PI to #HAB18

Manual operation: See "Program Identification (PI)" on page 25
[:SOURCE<hw>]:BB:STEReo:GRPS:CMNS:PTY <Pty>
Sets the program type number. The PTY number identifies the content of the program.
Parameters:
<Pty> integer
Range: 1 to 31
*RST: 1
Example:
SOUR:BB:STER:GRPS:CMNS:PTY 4
sets the PTY number
Manual operation: See “Program Type (PTY) Number” on page 26

[:SOURCE<hw>]:BB:STEReo:GRPS:CMNS:TP <Tp>
Enables/disables the traffic program.
Parameters:
<Tp> 0 | 1 | OFF | ON
*RST: OFF
Example:
SOUR:BB:STER:GRPS:CMNS:TP ON
enables sending of TP.
Manual operation: See “Traffic Program (TP)” on page 27

[:SOURCE<hw>]:BB:STEReo:GRPS:GT<st0>:ABFLag <AbFlag>
Sets the A/B Flag to 0 (disabled parameter) or 1 (enabled parameter).
Parameters:
<AbFlag> 0 | 1 | OFF | ON
*RST: OFF
Example:
SOUR:BB:STER:GRPS:GT10:ABFL ON
sets the A/B Flag for group type 10 to 1.
Manual operation: See “A/B Flag” on page 29

[:SOURCE<hw>]:BB:STEReo:GRPS:GT<st0>:AFON:DATA<ch0> <Data>
Sets the alternative frequency (AF) for other networks.
This command is enabled only for group type 14A.
Suffix:
<st0> 14
<ch0> 0 .. 24
Parameters:
<Data>
  float
  Range: 87.6 to 107.9
  Increment: 0.1
  *RST: 87.6

Example:
Enables using of 10 AFs.
Sets the alternative frequency at index 3 MHz to 108.5 MHz

Manual operation:
See "Frequency/ MHz (Alternative Frequency List ON)" on page 38

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:AFON:NOENtries <NoEntries>

Sets the number of alternative frequency of other networks to be configured. A maximal number of 25 AFs can be configured.

This command is enabled only for group type 14A.

Suffix:
<st0>

Parameters:
<NoEntries>
  integer
  Range: 0 to 25
  *RST: 0

Example:
enables using of 10 AFs.

Manual operation:
See "No. Of Used Frequencies (Alternative Frequency List ON)" on page 38

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:AFON:STATe <State>

Enables/disables using AF method A for other networks.

This command is enabled only for group type 14A.

Suffix:
<st0>

Parameters:
<State>
  0 | 1 | OFF | ON
  *RST: 0

Example:
SOUR:BB:STER:GRPS:GT14:AFON:STAT ON
Enables using of Alternative Frequency (ON)

Manual operation:
See "State (Alternative Frequency)" on page 37
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:ALTF:DATA<ch0> <Data>

Sets the alternative frequency (AF) for the broadcast frequency.
This command is enabled only for group type 0A.

Suffix:
<st0>  0
<ch0>  0 .. 24

Parameters:
<Data>  float
Range:  87.6 to 107.9
Increment:  0.1
*RST:  87.6

Example:
SOUR:BB:STER:GRPS:GT0:ALTF:NOEN 10
Enables using of 10 AFs.
SOUR:BB:STER:GRPS:GT0:ALTF:DATA3 108.5
Sets the alternative frequency at index 3 MHz to 108.5 MHz

Manual operation:  See "Frequency/ MHz (Alternative Frequency List)" on page 33

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:ALTF:NOENtries <NoEntries>

Sets the number of alternative frequencies to be configured. A maximal number of 25 AFs can be configured.
This command is enabled only for group type 0A.

Suffix:
<st0>  0

Parameters:
<NoEntries>  integer
Range:  0 to 25
*RST:  0

Example:
SOUR:BB:STER:GRPS:GT0:ALTF:NOEN 10
Enables using of 10 AFs.

Manual operation:  See "No. Of Used Frequencies (Alternative Frequency List)" on page 33

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DATE <Date>

Sets the date type to user date (USRDate) or system date (SYSDate).
This command is enabled only for group type 4A.

Suffix:
<st0>  4
### Remote-Control Commands

#### FM Stereo / RDS

**RDS/RBDS Group Settings**

<table>
<thead>
<tr>
<th>Parameters:</th>
<th>&lt;Date&gt;</th>
<th>SYSDate</th>
<th>USRDate</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>RST:</em></td>
<td></td>
<td>SYSDate</td>
<td></td>
</tr>
</tbody>
</table>

**Example:**

```
SOUR:BB:STER:GRPS:GT4:DATE USRD
```

**Selects user date**

**Manual operation:**

See "Date" on page 34

---

<table>
<thead>
<tr>
<th>Parameters:</th>
<th>[:SOURce&lt;hw&gt;:]:BB:STEReo:GRPS:GT&lt;st0&gt;:DID:ARTHead</th>
<th>&lt;ArtHead&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enables/disables using of Artificial Head.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example:**

```
SOUR:BB:STER:GRPS:GT0:DID:ARTH ON
```

**Enables artificial head**

**Manual operation:**

See "Artificial Head - DI" on page 32

---

<table>
<thead>
<tr>
<th>Parameters:</th>
<th>[:SOURce&lt;hw&gt;:]:BB:STEReo:GRPS:GT&lt;st0&gt;:DID:COMPRESSED</th>
<th>&lt;Compressed&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enables/disables the compressed bit of DI.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example:**

```
SOUR:BB:STER:GRPS:GT0:DID:COMP ON
```

**Enables the compressed bit**

**Manual operation:**

See "Compressed - DI" on page 32

---

<table>
<thead>
<tr>
<th>Parameters:</th>
<th>[:SOURce&lt;hw&gt;:]:BB:STEReo:GRPS:GT&lt;st0&gt;:DID:DATA</th>
<th>&lt;Data&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queries the current decoder operating mode (mono, stereo, etc.) as selected for group type 0.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This command is enabled only for group type 0 and 15B.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suffix:**

```
<st0> 0 .. 15
```

**Parameters:**

```
<integer>
```

**Range:**

0 to #HF

**Example:**

```
```

**Queries the DI**

**Response:** 0101
Manual operation:  See "Decoder Identification (DI)" on page 32

 [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:DPTY <DPty>
Enables/disables dynamically PTY switching.

Parameters:
<DPty> 0 | 1 | OFF | ON
*RST: OFF

Example: SOUR:BB:STER:GRPS:GT0:DID:DPTY OFF
disables dynamic PTY

Manual operation:  See "Dynamic PTY - DI" on page 32

 [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:DID:STEReo <Stereo>
Sets the mono/stereo switch in the DI.

Parameters:
<Stereo> 0 | 1 | OFF | ON
*RST: OFF

Example: SOUR:BB:STER:GRPS:GT0:DID:STER OFF
sets the DI bit to mono

Manual operation:  See "Stereo - DI" on page 33

 [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:INPM:UDMethod <InpMethod>
Selects the input format of the RDS/RBDS parameters.

Suffix:
<st0> 0 .. 15

Parameters:
<InpMethod> PARameters | UDMessage

PARameters
Configuration based on direct parameter input

UDMessage
User defined messages are used to configure the group types
*RST: PARameters

User defined messages are used.

Manual operation:  See "Input Method" on page 28

 [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:EG <Eg>
Enables/disables the Extended Generic Indicator EG.
This command is enabled only for group type 14A.

Suffix:  
<st0>  

Parameters:  
<Eg>  
0 | 1 | OFF | ON  
*RST: 0  

Example: SOUR:BB:STER:GRPS:GT14:LION:EG ON  
Enables the Extended Generic Indicator EG

Manual operation: See "Extended Generic Indicator (EG)" on page 39

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:ILS <Ils>  
Enables/disables the International Linkage Set indicator ILS.  
This command is enabled only for group type 14A.

Suffix:  
<st0>  

Parameters:  
<Ils>  
0 | 1 | OFF | ON  
*RST: 0  

enables ILS, i.e. sets ILS=1

Manual operation: See "International Linkage Set Ind." on page 39

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:LA <La>  
Enables/disables the Linkage Actuator LA.  
This command is enabled only for group type 14A.

Suffix:  
<st0>  

Parameters:  
<La>  
0 | 1 | OFF | ON  
*RST: 0  

enables LA, i.e. LA=1

Manual operation: See "Linkage Actuator (LA)" on page 39

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:LSN <Lsn>  
Sets the Linkage Set Number LSN.  
The LSN is a 12-bit number.
This command is enabled only for group type 14A.

Suffix:
<st0>  14

Parameters:
<Lsn>  12 bits

Sets the LSN to #H78

Manual operation:  See "Linkage Set Number (LSN)" on page 39

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LION:STATe <State>

Enables/disables using of Linkage Information.
This command is enabled only for group type 14A.

Suffix:
<st0>  14

Parameters:
<State>  0 | 1 | OFF | ON
*RST:  0

enables using of Linking Information

Manual operation:  See "State (Linkage Information)" on page 39

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LOTIme <LoTime>

Sets the local offset time expressed in multiples of half hours within the range -12h to +12h.
The time is the sum of the user time and the local time offset.
This command is enabled only for group type 4A.

Suffix:
<st0>  4

Parameters:
<LoTime>  string
Range:  -12,00 to 12,00
*RST:  0:00

Enables user time
SOUR:BB:STER:GRPS:GT4:USRT 12,15
Sets the user time
SOUR:BB:STER:GRPS:GT4:LOT 5,30
Sets the local offset time, i.e. the local time is 17:45

Manual operation:  See "Local Offset Time" on page 34
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MFL:DATA<ch0>:MF <Mf>

Sets a mapped frequency entry.

Sets a mapped frequency entry. The following variant codes are used to encode the frequency settings:

- Variant code 5 (binary 0101) mapped FM frequency 1 (on)
- Variant code 6 (binary 0110) mapped FM frequency 2 (on)
- Variant code 7 (binary 0111) mapped FM frequency 3 (on)
- Variant code 8 (binary 1000) mapped FM frequency 4 (on)
- Variant code 9 (binary 1001) mapped AM frequency (on)

This command is enabled only for group type 14A.

Suffix:
<st0> 14
<ch0> 0 to 4

Parameters:
<Mf> float
  Range: depends on channel: 87.6 to 107.9 MHz (data 0 to 3); 153 to 279 kHz/531 to 1602 kHz (data 4)
  Increment: 0.001
  *RST: depends on channel

Example:
BB:STER:GRPS:GT14:MFL:MF2 101.3
Sets the mapped frequency at index 2 MHz to 101.3 MHz.
BB:STER:GRPS:GT14:MFL:MF4 532
Sets the mapped frequency at index 4 kHz to 532 kHz.

Manual operation: See "Mapped Frequency (ON)/ MHz" on page 39

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:MFL:DATA<ch0>:TF <Tf>

Sets a tuning frequency entry.

The following variant codes are used to encode the frequency settings:

- Variant Code 5 (binary 0101) Tuning FM frequency 1 (ON)
- Variant Code 6 (binary 0110) Tuning FM frequency 2 (ON)
- Variant Code 7 (binary 0111) Tuning FM frequency 3 (ON)
- Variant Code 8 (binary 1000) Tuning FM frequency 4 (ON)
- Variant Code 9 (binary 1001) Tuning AM frequency (ON)

This command is enabled only for group type 14A.

Suffix:
<st0> 14
<ch0> 0 .. 4
Remote-Control Commands

**Parameters:**

- `<Tf>`  
  - Type: float  
  - Range: depends on channel: 87.6 .. 107.9 MHz (Data 0..3) or 153 .. 279 kHz/531 .. 1602 kHz (Data 4)  
  - Increment: 0.001  
  - *RST:* depends on channel

**Example:**  
BB:STER:GRPS:GT14:MFL:TF2 87.7  
Sets the tuning frequency at index 2 MHz to 87.7 MHz.

**Manual operation:**  
See "Tuning Frequency (TN)/ MHz” on page 38

---

RDS/RBDS Group Settings

```plaintext
[:SOURce<hw>]:BB:STEREo:GRPS:GT<st0>:MFL:NOENtries <NoEntries>
```

For group type 14, sets the number of mapped frequencies to be configured.

**Suffix:**

- `<st0>`: 14

**Parameters:**

- `<NoEntries>`: integer  
  - Range: 0 to 5  
  - *RST:* 0

**Example:**  
Sets three mapped frequencies

**Manual operation:**  
See "No. Of Used Frequencies (Mapped Frequency List)” on page 38

---

```plaintext
[:SOURce<hw>]:BB:STEREo:GRPS:GT<st0>:MFL:STATe <State>
```

Enables/disables using of mapped frequencies.

This command is enabled only for group type 14A.

**Suffix:**

- `<st0>`: 14

**Parameters:**

- `<State>`: 0 | 1 | OFF | ON  
  - *RST:* 0

**Example:**  
SOUR:BB:STER:GRPS:GT14:MFL:STAT ON  
enables using of mapped sequences

**Manual operation:**  
See "State (Mapped Frequencies)” on page 38

---

```plaintext
[:SOURce<hw>]:BB:STEREo:GRPS:GT<st0>:MVSWiッチ <MvSwitch>
```

For GT0, enables switching between speech and music transmission.

For GT15B, this command is query only.
Suffix:  
<st0>  
Parameters:  
<MvSwitch>  
MUSic | VOICe  
*RST:  
MUSic  
Example:  
SOUR:BB:STER:GRPS:GT0:MVSW VOIC  
Enables voice transmission  
SOUR:BB:STER:GRPS:GT15:MVSW?  
Queries the state of Music/Voice parameter  
Response: Voice  

Manual operation:  
See "Music/Voice Switch" on page 32

RDS/RBDS Group Settings

[:SOURce<hw>:]BB:STEReo:GRPS:GT<st0>:PINon:PIN <Pin>

Enters the program item number (PIN) of other networks.
This command is enabled only for group type 14A.

Suffix:  
<st0>  
Parameters:  
<Pin>  
16 bits  
Example:  
SOUR:BB:STER:GRPS:GT14:PIN:STAT ON  
enables using of PIN (ON)  
sets the PIN of other networks  

Manual operation:  
See "Program Item Number (PIN) - Other Networks (ON)" on page 40

[:SOURce<hw>:]BB:STEReo:GRPS:GT<st0>:PINon:STATe <State>

Enables/disables using of PIN (ON).
This command is enabled only for group type 14A.

Suffix:  
<st0>  
Parameters:  
<State>  
0 | 1 | OFF | ON  
*RST:  
0  
Example:  
SOUR:BB:STER:GRPS:GT14:PIN:STAT ON  
enables using of PIN (ON)  

Manual operation:  
See "State (PIN) - Other Networks (ON)" on page 40
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PIOn <PiOn>

Sets the parameter Program Identification of other networks in hex format.
This command is enabled only for group type 14A.

Suffix:
<st0> 14

Parameters:
<PiOn> 16 bits
Range: #H0000 to #HFFFF
*RST: #HD238

Example: SOUR:BB:STER:GRPS:GT14:PION #H2D3A
sets the PI (ON)

Manual operation: See "Program Identification (PI) - Other Networks (ON)"
on page 36

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PSName <PsName>

Enters the program service (PS) name.
The default maximum length of PS is 8 characters.

Suffix:
<st0> 0

Parameters:
<PsName> string
*RST: SMU-FM

Example: SOUR:BB:STER:GRPS:GT0:PSN 'Program 1'
sets the PS name.

Manual operation: See "Program Service Name" on page 33

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PSON:PSName <PsName>

Enters the program service name (max 8 characters) of other networks.
This command is enabled only for group type 14A.

Suffix:
<st0> 14

Parameters:
<PsName> string
*RST: SMU-FM2

Example: SOUR:BB:STER:GRPS:GT14:PSON:PSN 'PrServ1'
sets the program service name (ON)
SOUR:BB:STER:GRPS:GT14:PSON:STAT ON
enables using of program service name (ON).
Manual operation: See "Program Service (PS) Name - Other Networks (ON)" on page 37

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PSON:STATe <State>
Enables/disables sending of program service name of other networks PS (ON).
This command is enabled only for group type 14A.

Suffix: <st0> 14
Parameters: <State> 0 | 1 | OFF | ON
*RST: 0

Manual operation: See "State (Program Service) - Other Networks (ON)" on page 37

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PTName <PtName>
Enters the program type name (max eight characters).
This command is enabled only for group type 10A.

Suffix: <st0> 10
Parameters: <PtName> <Program Type Name>
*RST: Music
Enters the program type name

Manual operation: See "Program Type Name" on page 29

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PTYTa:PTY <Pty>
Sets the program type number of other networks.
This command is enabled only for group type 14A.

Suffix: <st0> 14
Parameters: <Pty> integer
Range: 0 to 31
*RST: 0
Enables PTY/TA of other networks
Sets the program type (ON)

Manual operation: See “Program Type (PTY) Number - Other Networks (ON)” on page 40

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PTYTa:STATe <State>
Enables/disables using of PTY (ON) and TA (ON).
This command is enabled only for group type 14A.

Parameters:
<State> 0 | 1 | OFF | ON
*RST: OFF

enables PTY/TA of other networks

Manual operation: See “State (PTY/TA) - Other Networks (ON)” on page 40

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:PTYTa:TA <Ta>
Enables/disables the traffic announcement (TA) of other networks.
This command is enabled only for group type 14A.

Suffix:
<st0> 14

Parameters:
<Ta> 0 | 1 | OFF | ON
*RST: 0

Enables PTY/TA of other networks
SOUR:BB:STER:GRPS:GT14:PTYT:TAON ON
Enables traffic communication (ON)

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:RADText <RadText>
Sets the radio text.
This command is enabled only for group type 2.

Suffix:
<st0> 2

Parameters:
<RadText> string
*RST: SMU-Radio
Example: \texttt{SOUR:BB:STER:GRPS:GT2:RADT 'RADIO MESSAGE'}
sets the radio text

Manual operation: See "Radio Text" on page 29

\texttt{[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:STATe <State>}

Enables/disables the transmission of the corresponding group type.

Suffix:
<st0> 0 .. 15

Parameters:
<State> 0 | 1 | OFF | ON
*RST:  1

Example: \texttt{SOUR:BB:STER:GRPS:GT12:STAT ON}
Group 12 is transmitted

Manual operation: See "State" on page 30

\texttt{[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:SYSDate <SysDate>}

Queries the system date.

This command is enabled only for group type 4A.

Suffix:
<st0> 14

Parameters:
<SysDate> string
Range: 01,01,2006 to 31,12,9999

Example: \texttt{SOUR:BB:STER:GRPS:GT4:DATE SYSD}
selects system date
\texttt{SOUR:BB:STER:GRPS:GT4:SYSD?}
queries the system date
Response: 3,6,2008

Manual operation: See "System Date" on page 34

\texttt{[:SOURce<hw>:]:BB:STEReo:GRPS:GT<st0>:SYSTime <SysTime>}

Queries the system time.

This command is enabled only for group type 4A.

Suffix:
<st0> 4

Parameters:
<SysTime> string
Range: 00,00 to 23,59
Selects system date
SOUR:BB:STER:GRPS:GT4:SYST?
Queries the system time

Manual operation: See "System Time" on page 34

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TA <Ta>
Enables/disables broadcasting of traffic announcement.

Parameters:
<Ta> 0 | 1 | OFF | ON
*RST: OFF

Example: SOUR:BB:STER:GRPS:GT0:TA ON
Enables TA for group type 0

Manual operation: See "Traffic Announcement" on page 31

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TABFlag <TabFlag>
Sets the Text A/B Flag to 0 (disabled parameter) or 1 (enabled parameter).

Parameters:
<TabFlag> 0 | 1 | OFF | ON
*RST: OFF

Example: SOUR:BB:STER:GRPS:GT2:TABF ON
sets the Text A/B Flag for group type 2 to 1.

Manual operation: See "Text A/B Flag" on page 29

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TAON <TaOn>
Enables/disables the traffic announcement (TA) of other networks.
This command is enabled only for group type 14B.

Suffix: <st0> 14

Parameters:
<TaOn> 0 | 1 | OFF | ON
*RST: 0

Example: SOUR:BB:STER:GRPS:GT14:TAON ON
Enables TA (ON)

Manual operation: See "Traffic Announcement (TA) - Other Networks (ON)" on page 40
Remote-Control Commands

**FM Stereo / RDS**

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### [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TIME <Time>

Sets the time type to system time (SYSTime) or user time (USRTtime).

This command is enabled only for group type 4A.

**Suffix:**

<st0>

**Parameters:**

<Time> SYSTime | USRTtime

*RST: SYSTime

**Example:**

SOUR:BB:STER:GRPS:GT4:TIME USRT
selects user time

**Manual operation:** See "Time" on page 34

---

### [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TPON <TpOn>

Enables/ disables the traffic program of other networks.

**Parameters:**

<TpOn> 0 | 1 | OFF | ON

*RST: OFF

**Example:**

SOUR:BB:STER:GRPS:GT14:TPON ON
enables traffic program (ON)

**Manual operation:** See "Traffic Program (TP) - Other Networks (ON)" on page 36

---

### [:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:TTIMe <TTime>

Sets the group transmit time. The transmit time is the group repetition rate given as proportion. The sum of all transmit time is 100%.

Only groups with "State" set to On ([:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:STATe) are transmitted.

**Suffix:**

<st0>

**Parameters:**

<TTime> integer

Range: 0 to 100

*RST: 40% (GT0), 10% (GT1), 15% (GT2), 4% (GT3), 2%

(GT4..GT13), 10% (GT14), 1% (GT15)

**Example:**

SOUR:BB:STER:GRPS:GT12:STAT ON
Group 12 is transmitted
The transmission time of group 12 is 6%

**Manual operation:** See "Tx Time" on page 30
[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:UMT:DATA<ch0>:BLOck<user>
<br Block>
Sets the hex value for the corresponding block of the corresponding user message hex table row.
Checkword and offset are automatically calculated.

Suffix:
<st0> 0 .. 25
<ch0> 0 .. 31
<user> 2 .. 4
Parameters:
<Block> integer
Range: 0 to #H1F
*RST: 0
Example: SOUR:BB:STER:GRPS:GT0:UMT:DATA0:BLOCk2 #H1F
sets block 2 to 1F

Manual operation: See "Block 2 (User Message Table)" on page 42

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:UMT:NOENtries <NoEntries>
Sets the number of transmitted groups per message. A maximal number of 32 groups can be configured.

Suffix:
<st0> 0 .. 15
Parameters:
<NoEntries> integer
Range: 0 to 32
*RST: 1
Example: SOUR:BB:STER:GRPS:GT0:UMT:NOEN 4
Four user defined messages are used

Manual operation: See "No. Of Message Entries (User Message Table)" on page 41

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:USRDate <UsrDate>
Sets the user date in format DD,MM,YYYY.
This command is enabled only for group type 4A.

Suffix:
<st0> 4
Parameters:
<UserDate>
DD,MM,YYYY
Range: 01,01,2006 to 31,12,9999
*RST: 01,01,2006

Example:
SOUR:BB:STER:GRPS:GT4:DATE USRD
selects user date
SOUR:BB:STER:GRPS:GT4:USRD '30,05,2008'
sets the user date

Manual operation:
See "User Date" on page 34

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:USRTime <UsrTime>

Sets the user time in format HH, MM. The time is the sum of the user time and the local
time offset ([:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:LOTime).

This command is enabled only for group type 4A.

Suffix:
<st0>
4

Parameters:
<UserTime>
string
Range: 00,00 to 23,59
*RST: 00,00

Example:
SOUR:BB:STER:GRPS:GT4:TIME USRT
Selects user time
SOUR:BB:STER:GRPS:GT4:USRT 12,15
Sets the user time

Manual operation:
See "User Time" on page 34

[:SOURce<hw>]:BB:STEReo:GRPS:GT<st0>:VERSion <Version>

Sets the group type version of the corresponding group type.

Suffix:
<st0>
0 .. 15

Parameters:
<Version>
A | B
A
Group Type Version A
B
Group Type Version B
*RST: A

Example:
SOUR:BB:STER:GRPS:GT2:VERS B
sets group type 2 with version B

Manual operation:
See "Group Type Version" on page 29
[:SOURce<hw>]:BB:STEReo:GRPS:PRESet
Sets all group parameter values to the default settings.

Example: SOURc1:BB:STEReo:GRPS:PRESet

Usage: Event

Manual operation: See "Set Groups to Default" on page 25

[:SOURce<hw>]:BB:STEReo:GRPS:STORe <Store>
Stores the current RDS/RBDS group settings into the selected file. The directory is set using command MMEM:CDIRectory. A path can also be specified, in which case the files in the specified directory are read. Only enter the file name. RDS/RBDS group settings are stored as files with the specific file extension *.fm_gt.

Setting parameters:
<Store> string

Example: SOUR:BB:STER:GRPS:STOR 'fm_groups'
Saves the RDS/RBDS setting into the file fm_groups.fm_gt

Usage: Setting only

Manual operation: See "Save Groups" on page 25
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