MX370105A/MX269905A
Mobile WiMAX IQproducer™
Operation Manual

Ninth Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided within the MG3700A Vector Signal Generator Operation Manual (Mainframe), MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe), MS2690A/MS2691A/ MS2692A Signal Analyzer Operation Manual (Mainframe Operation), or MS2830A Signal Analyzer Operation Manual (Mainframe Operation). Please also refer to either of these documents before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W2918AE-9.0

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual

⚠ DANGER This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.

⚠ WARNING This indicates a hazardous procedure that could result in serious injury or death if not performed properly.

⚠ CAUTION This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.

This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.

This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.

This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.

This indicates a note. The contents are described in the box.

These indicate that the marked part should be recycled.

MX370105A/MX269905A
Mobile WiMAX IQproducer™
Operation Manual

25 April 2007 (First Edition)
25 November 2014 (Ninth Edition)

Equipment Certificate

Anritsu Corporation guarantees that this equipment was inspected at shipment and meets the published specifications.

Anritsu Warranty

- During the warranty period, Anritsu Corporation will repair or exchange this software free-of-charge if it proves defective when used as described in the operation manual.
- The warranty period is 6 months from the purchase date.
- The warranty period after repair or exchange will remain 6 months from the original purchase date, or 30 days from the date of repair or exchange, depending on whichever is longer.
- This warranty does not cover damage to this software caused by Acts of God, natural disasters, and misuse or mishandling by the customer.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation shall assume no liability for injury or financial loss of the customer due to the use of or a failure to be able to use this equipment.

Anritsu Corporation Contact

In the event that this equipment malfunctions, contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the CD version.

Notes On Export Management

This product and its manuals may require an Export License/Approval by the Government of the product's country of origin for re-export from your country.

Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not.

When you dispose of export-controlled items, the products/manuals need to be broken/shredded so as not to be unlawfully used for military purpose.

Software End-User License Agreement (EULA)

Please read this Software End-User License Agreement (hereafter this EULA) carefully before using (includes executing, copying, registering, etc.) this software (includes programs, databases, scenarios, etc., used to operate, set, etc., Anritsu electronic equipment). By reading this EULA and using this software, you are agreeing to be bound by the terms of its contents and Anritsu Corporation (hereafter Anritsu) hereby grants you the right to use this Software with the Anritsu-specified equipment (hereafter Equipment) for the purposes set out in this EULA.

1. Grant of License and Limitations

1. Regardless of whether this Software was purchased from or provided free-of-charge by Anritsu, you agree not to rent, lease, lend, or otherwise distribute this Software to third parties and further agree not to disassemble, recompile, reverse engineer, modify, or create derivative works of this Software.
2. You may make one copy of this Software for backup purposes only.
3. You are not permitted to reverse engineer this software.
4. This EULA allows you to install one copy of this Software on one piece of Equipment.

2. Disclaimers

To the extent not prohibited by law, in no event shall Anritsu be liable for personal injury, or any incidental, special, indirect or consequential damages whatsoever, including, without limitation, damages for loss of profits, loss of data, business interruption or any other commercial damages or losses, arising out of or related to your use or inability to use this Software.

3. Limitation of Liability

a. If a fault (bug) is discovered in this Software, preventing operation as described in the operation manual or specifications whether or not the customer uses this software as described in the manual, Anritsu shall at its own discretion, fix the bug, or exchange the software, or suggest a workaround, free-of-charge. However, notwithstanding the above, the following items shall be excluded from repair and warranty.
   i) If this Software is deemed to be used for purposes not described in the operation manual or specifications.
   ii) If this Software is used in conjunction with other non-Anritsu-approved software.
   iii) Recovery of lost or damaged data.
   iv) If this Software or the Equipment has been modified, repaired, or otherwise altered without Anritsu's prior approval.
   v) For any other reasons out of Anritsu's direct control and responsibility, such as but not limited to, natural disasters, software virus infections, etc.

b. Expenses incurred for transport, hotel, daily allowance, etc., for on-site repairs by Anritsu engineers necessitated by the above faults shall be borne by you.

c. The warranty period for faults listed in article 3a above covered by this EULA shall be either 6 months from the date of purchase of this Software or 30 days after the date of repair, whichever is longer.

4. Export Restrictions

You may not use or otherwise export or re-export directly or indirectly this Software except as authorized by Japanese and United States law. In particular, this software may not be exported or re-exported (a) into any Japanese or US embargoed countries or (b) to anyone on the Japanese or US Treasury Department's list of Specially Designated Nationals or the US Department of Commerce Denied Persons List or Entity List. By using this Software, you warrant that you are not located in any such country or on any such list. You also agree that you will not use this Software for any purposes prohibited by Japanese and US law, including, without limitation, the development, design and manufacture or production of missiles or nuclear, chemical or biological weapons of mass destruction.

5. Termination

Anritsu shall deem this EULA terminated if you violate any conditions described herein. This EULA shall also be terminated if the conditions herein cannot be continued for any good reason, such as violation of copyrights, patents, or other laws and ordinances.

6. Reparations

If Anritsu suffers any loss, financial or otherwise, due to your violation of the terms of this EULA, Anritsu shall have the right to seek proportional damages from you.

7. Responsibility after Termination

Upon termination of this EULA in accordance with item 5, you shall cease all use of this Software immediately and shall as directed by Anritsu either destroy or return this Software and any backup copies, full or partial, to Anritsu.

8. Dispute Resolution

If matters of dispute or items not covered by this EULA arise, they shall be resolved by negotiations in good faith between you and Anritsu.

9. Court of Jurisdiction

This EULA shall be interpreted in accordance with Japanese law and any disputes that cannot be resolved by negotiation described in Article 8 shall be settled by the Japanese courts.

Cautions against computer virus infection

- Copying files and data
  Only files that have been provided directly from Anritsu or generated using Anritsu equipment should be copied to the instrument.
  All other required files should be transferred by means of USB or CompactFlash media after undergoing a thorough virus check.
- Adding software
  Do not download or install software that has not been specifically recommended or licensed by Anritsu.
- Network connections
  Ensure that the network has sufficient anti-virus security protection in place.

Protection Against Computer Virus Infections

Prior to the software installation

Before installing this software or any other software recommended or approved by Anritsu, run a virus scan on your computer, including removable media (e.g. USB memory stick and CF memory card) you want to connect to your computer.

When using this software and connecting with the measuring instrument

- Copying files and data
  On your computer, do not save any copies other than the following:
  - Files and data provided by Anritsu
  - Files created by this software
  - Files specified in this document

  Before copying these files and/or data, run a virus scan, including removable media (e.g. USB memory stick and CF memory card).
- Connecting to network
  Connect your computer to the network that provides adequate protection against computer viruses.

Cautions on Proper Operation of Software

This software may not operate normally if any of the following operations are performed on your computer:

- Simultaneously running any software other than that recommended or approved by Anritsu
- Closing the lid (Laptop computer)
- Turning on the screen saver function
- Turning on the battery-power saving function (Laptop computer)

For how to turn off the functions, refer to the operation manual that came with your computer.

CE Conformity Marking

Anritsu affixes the CE conformity marking on the following product(s) in accordance with the Council Directive 93/68/EEC to indicate that they conform to the EMC and LVD directive of the European Union (EU).

CE marking

1. Product Model

Software: MX370105A/MX269905A Mobile WiMAX IQproducer™

2. Applied Directive and Standards

When the MX370105A/MX269905A Mobile WiMAX IQproducer™ is installed in the MG3710A, MS2690A/MS2691A/MS2692A, or MS2830A, the applied directive and standards of this software conform to those of the MG3710A, MS2690A/MS2691A/MS2692A, or MS2830A main frame.

PS: About main frame
Please contact Anritsu for the latest information on the main frame types that MX370105A/MX269905A can be used with.

C-tick Conformity Marking

Anritsu affixes the C-tick mark on the following product(s) in accordance with the regulation to indicate that they conform to the EMC framework of Australia/New Zealand.

C-tick marking

1. Product Model

Software: MX370105A/MX269905A Mobile WiMAX IQproducer™

2. Applied Directive and Standards

When the MX370105A/MX269905A Mobile WiMAX IQproducer™ is installed in the MG3710A, MS2690A/MS2691A/MS2692A, or MS2830A, the applied directive and standards of this software conform to those of the MG3710A, MS2690A/MS2691A/MS2692A, or MS2830A main frame.

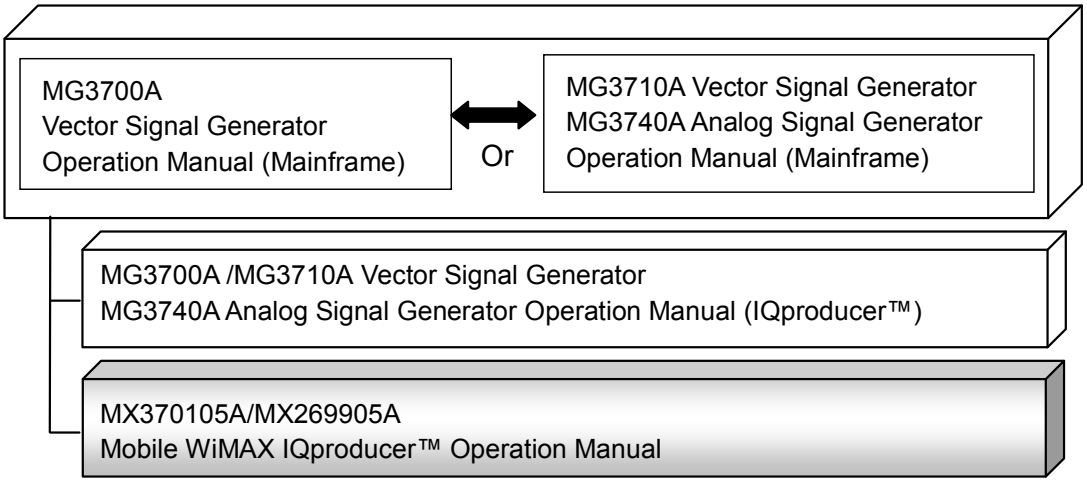
PS: About main frame
Please contact Anritsu for the latest information on the main frame types that MX370105A/MX269905A can be used with.

About This Manual

■Associated Documents

The operation manual configuration of the MX370105A/MX269905A Mobile WiMAX IQproducer™ is shown below.

■If using MG3700A or MG3710A:



- MG3700A Vector Signal Generator Operation Manual (Mainframe)

This describes basic operations, maintenance procedure, and remote functions of the MG3700A Vector Signal Generator.

Or

- MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)

This describes basic operations, maintenance procedure, and remote functions of the MG3710A Vector Signal Generator and the MG3740A Analog Signal Generator.

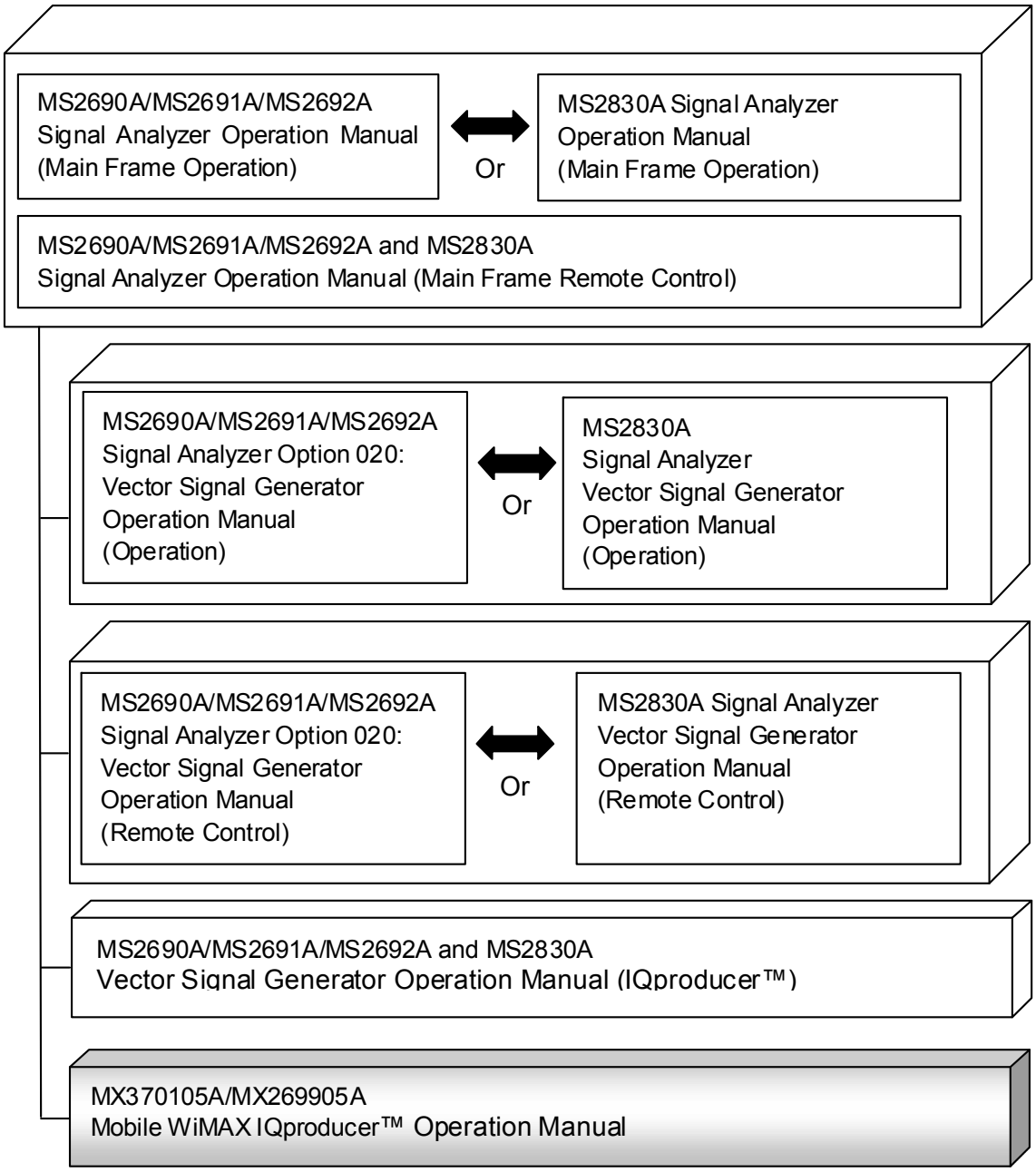
- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)

This describes the functions and how to use the IQproducer, which is Windows software for the Vector Signal Generator and the Analog Signal Generator.

- Mobile WiMAX IQproducer™ Operation Manual (This document)

This describes basic operations and functions of the Mobile WiMAX IQproducer™.

■If using MS2690A/MS2691A/MS2692A or MS2830A:



- MS2690A/MS2691A/MS2692A Signal Analyzer Operation Manual (Mainframe, Operation)

This describes basic operations, maintenance procedure, common functions and common remote functions of the MS2690A/MS2691A/MS2692A.

Or

- MS2830A Signal Analyzer Operation Manual (Mainframe, Operation)

This describes basic operations, maintenance procedure, common functions and common remote functions of the MS2830A.

- MS2690A/MS2691A/MS2692A and MS2830A Signal Analyzer Operation Manual (Mainframe, Remote Control)

These describe basic operations, maintenance procedure, common functions and common remote functions of the MS2690A/MS2691A/MS2692A or MS2830A.

- MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual, Operation

This describes the functions and how to use the Vector Signal Generator option.

Or

- MS2830A Vector Signal Generator Operation Manual, Operation

This describes the functions and how to use the Vector Signal Generator option.

- MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual, Remote Control

This describes how to remotely control the Vector Signal Generator option.

Or

- MS2830A Vector Signal Generator Operation Manual, Remote Control

This describes how to remotely control the Vector Signal Generator option.

- MS2690A/MS2691A/MS2692A and MS2830A Vector Signal Generator Operation Manual (IQproducer™)

This describes the functions and how to use the IQproducer, which is Windows software for the Vector Signal Generator option.

- Mobile WiMAX IQproducer™ Operation Manual (This document)

This describes basic operations and functions of the Mobile WiMAX IQproducer™.

Table of Contents

Chapter 1 Overview

This chapter provides an overview of the MX370105A/MX269905A Mobile WiMAX IQproducer™.

1.1 Product overview

MX370105A/MX269905A Mobile WiMAX IQproducer™ (hereinafter referred to as “this software”) is software used to generate waveform patterns that conforms to the IEEE802.16e-2005, IEEE P802.16Rev2/D3 WirelessMAN-OFDMA MAC, and PHY specifications.

This software requires either of the following environment:

- MG3710A Vector Signal Generator
- MS2690A/MS2691A/MS2692A or MS2830A Signal Analyzer with Vector Signal Generator option mounted
- Personal computer (hereinafter, “PC”)

This software generates waveform patterns that support the specifications of IEEE802.16e-2005, IEEE P802.16Rev2/D3 WirelessMAN-OFDMA MAC, and PHY with various characteristics. This is made possible by the editing/customizing of parameters according to its use.

A waveform pattern created by this software can be output using an RF signal after being downloaded into the MG3700A Vector Signal Generator, MG3710A Vector Signal Generator, or an MS2690A/MS2691A/MS2692A or MS2830A Signal Analyzer with Vector Signal Generator option installed (collectively referred to as “mainframe”, or “this equipment”).

1.2 Product Composition

The following table lists the model name and specifications of this software according to the equipment.

Table 1.2-1 Restrictions

Mainframe / Restrictions	MG3700A	MG3710A	MS2690A MS2691A MS2692A	MS2830A
Software name	MX370105A		MX269905A	
Maximum Size of Waveform Patterns	256 M sample 512 M sample*1	64 M sample 128 M sample*5 256 M sample*6 512 M sample*7	256 M sample	64 M sample 256 M sample*4
Transmission method of Waveform Patterns	LAN, CompactFlash Card	External device such as LAN, USB memory*2	USB Memory and other external device *2	USB Memory and other external device *2
Installation of this software to this equipment	N/A	Possible	Possible *3	Possible *3

*1: The ARB memory expansion 512M sample (optional) must be installed into the MG3700A to use waveform patterns that exceed 256 M samples.

*2: Transferring waveform patterns is not required if the waveform patterns are created on the equipment using this software.

*3: Although this software can be installed and run in the MS2690A/MS2691A/MS2692A or MS2830A, the measurement functions of the MS2690A/MS2691A/MS2692A or MS2830A are not guaranteed while this software runs.

*4: The ARB memory expansion 256M sample (optional) must be installed into the Vector Signal Generator option to use waveform patterns that exceed 64 M samples.

*5: The Combination of Baseband Signal (optional) must be installed into the MG3710A to use waveform patterns of maximum 128 M samples.

*6: The ARB memory expansion 256M sample (optional) must be installed into the MG3710A to use waveform patterns of maximum 256 M samples.

*7: To use waveform patterns of maximum 512 M samples, either of the following must be installed into MG3710A:

- ARB memory expansion 1024 M sample (optional)
- ARB memory expansion 256 M (optional) and Combination of Baseband Signal (optional)

■Notes on waveform pattern conversion

The waveform patterns generated with this software varies according to the main unit type. If using the waveform pattern to the different main unit, you need to convert the waveform pattern.

For details about how to convert a waveform pattern, refer to each one of the following manuals.

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
  4.5 “File Conversion on Convert Screen”
- MS2690A/MS2691A/MS2692A and MS2830A Vector Signal Generator Operation Manual (IQproducer™)
  4.5 “File Conversion on Convert Screen”

Chapter 2 Preparation

This chapter describes the operating environment for the MX370105A/MX269905A.

2.1 Operating Environment

The following environment is required for operating the MX370105A/MX269905A.

(1) PC that meets the following conditions

OS	Windows XP/Windows Vista/Windows 7
CPU	Pentium III 1 GHz equivalent or faster
Memory	512 MB or more
Hard disk space	5 GB or more free space in the drive where this software is to be installed. The free hard disk space necessary to create waveform pattern varies depending on the waveform pattern size. The free disk space of 27 GB or greater is required to create four maximum (512 Msample) waveform patterns.

(2) If viewing on PC, displays with a resolution of 1024 × 768 pixels are best viewed using a small font setting.

2.2 Installation/Uninstallation

This software is included in the IQproducer™ installer. It is automatically installed by installing the IQproducer™ that is supplied with this equipment or this software. When using a waveform pattern created using this software in the equipment, the license file must be installed in advance.

■Installing/Uninstalling IQproducer™

For how to install and uninstall IQproducer™, refer to each of the following manuals:

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
  Chapter 2 “Installation”
- MS2690A/MS2691A/MS2692A and MS2830A Vector Signal Generator Operation Manual (IQproducer™)
  Chapter 2 “Installation”

■Installing/Uninstalling IQproducer™ license file

For how to install license file to MG3700A/MG3710A, refer to the following manual:

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
  5.1 “Installing License File”

For how to uninstall license file from MG3700A/MG3710A, refer to each one of the following manuals:

- MG3700A Vector Signal Generator Operation Manual (Mainframe)
  3.10.10 “Install”
- MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)
  9.4.4 “Install”

Refer to the following manual for details of how to install/uninstall license file to MS2690A/MS2691A/MS2692A or MS2830A with Vector Signal Generator option.

- MS2690A/MS2691A/MS2692A and MS2830A Vector Signal Generator Operation Manual (IQproducer™)
  2.2 “Installation/Uninstallation”

2.3 Starting up and exiting the software

This section explains how to start and stop this software.

Note:

The following explanation assumes the use of Windows XP. The screen image may differ slightly if not using Windows XP.

2.3.1 Starting Software: When installed on other than MG3710A

Start this software using the following procedure.
The example assumes that it is a PC operation.

<Procedure>

1. Click **Start** on the task bar, and point to **All Programs**. Next, point to **Anritsu Corporation**, point to **IQproducer**, and then click I**Qproducer**.

2. When IQproducer™ starts, the **Select instrument** screen is displayed.

   On the **Select instrument** screen, select the model of the main unit that uses the waveform patterns created by IQproducer™.

Notes:

- This software does not support MG3740A.
- To hide this screen and to start with the selected mainframe's screen from the next time, select the **Don't show this window next time** check box.

3. The common platform screen is displayed when **OK** is clicked in the **Select instrument** screen.

   The common platform screen is a screen used to select each function of the IQproducer™.

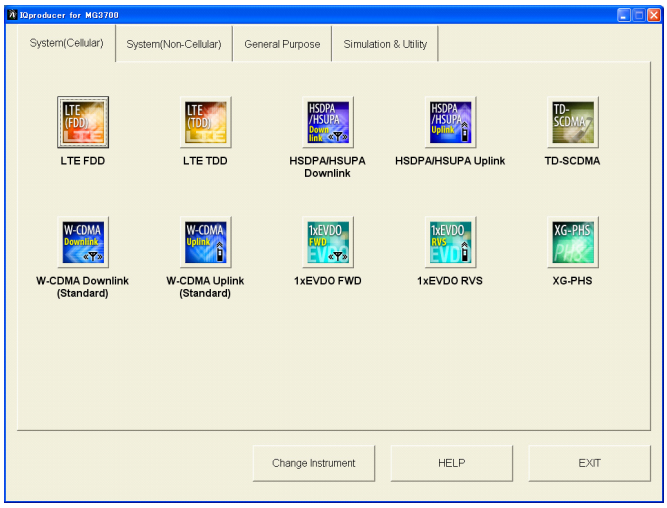


Figure 2.3.1-1 Common Platform Screen

4. Click the **System (Non-Cellular)** tab on the common platform screen, to show the **System (Non-Cellular)** selection screen that supports each telecommunication system.

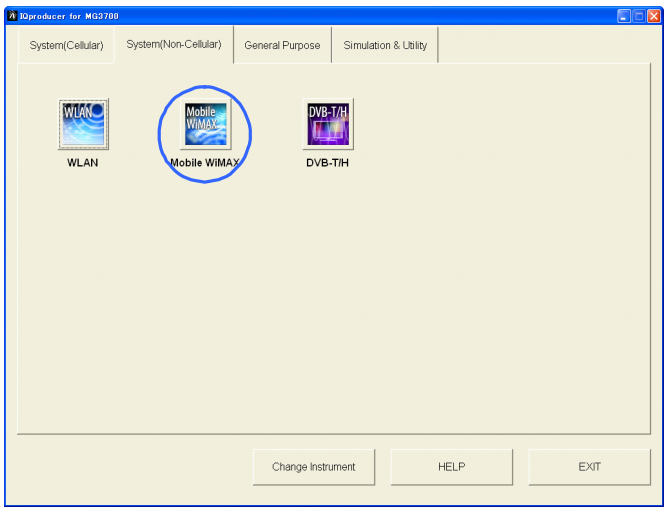


Figure 2.3.1-2 System (Non-Cellular) Selection Screen

5. Click **Mobile WiMAX** to display the main screen. For details of the main screen, refer to Chapter 3 “Detailed Description of Functions”.

Note:

If **Change Instrument** is clicked, the **Select instrument** screen will appear each time the software is loaded.

2.3.2 Starting Software: When installed on MG3710A

Start this software using the following procedure.

<Procedure>

1. Press IQpro on the MG3710A front panel to display the common platform screen.

   The common platform screen is a screen used to select each function of the IQproducer™.

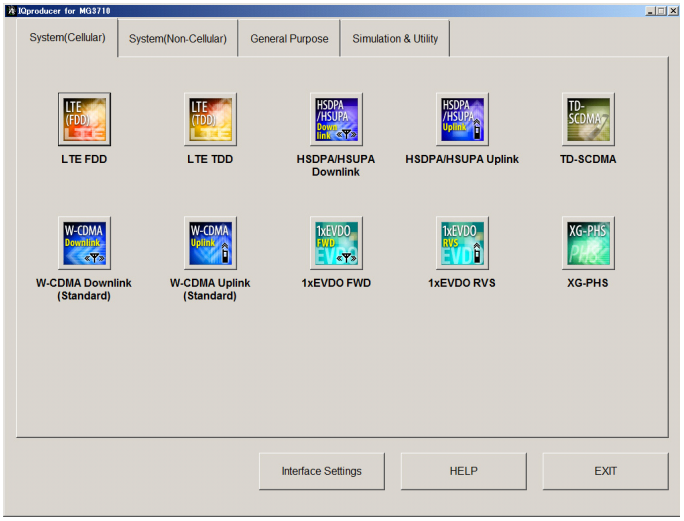


Figure 2.3.2-1 Common Platform Screen

2. Click the **System (Non-Cellular)** tab on the common platform screen, to show the **System (Non-Cellular)** selection screen that supports each telecommunication system.

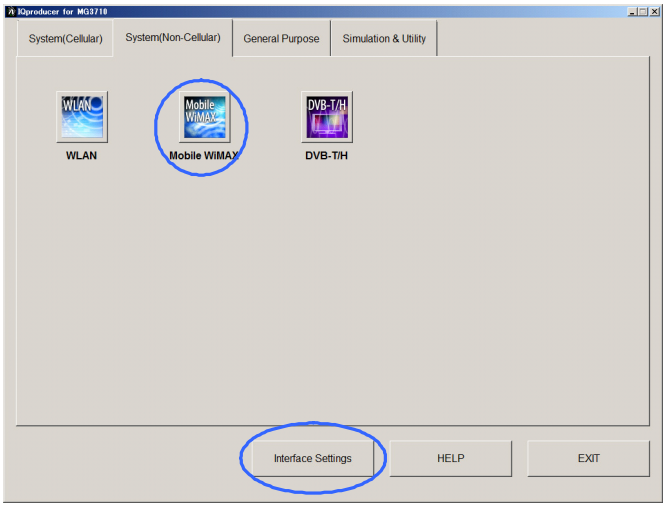


Figure 2.3.2-2 System (Non-Cellular) Selection Screen

3. Click **Mobile WiMAX** to display the main screen. For details of the main screen, refer to Chapter 3 “Detailed Description of Functions”.

Note:

When this software is installed on MG3710A, **Change Instrument** displays instead of **Interface Settings**. Clicking **Interface Settings** displays the Interface Setting dialog box.

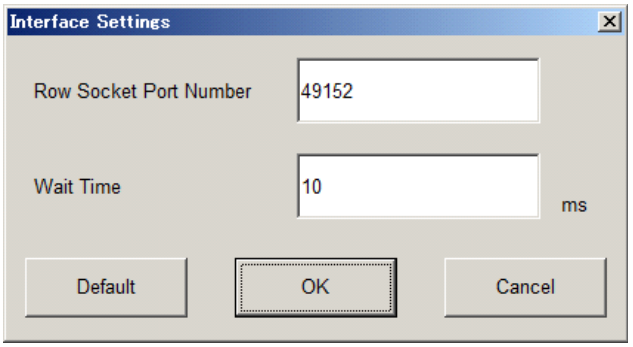


Figure 2.3.2-3 Interface Settings Dialog Box

Here, you can configure interface-related settings of IQproducer and MG3710A. To return to factory defaults, click **Default**.

- Row Socket Port Number

  Sets Row Socket port number. Set the same value as that for MG3710A.

- Wait Time

  Sets the wait time between commands.

2.3.3 Exiting Software

Stop this software using the following procedure.

■When exiting only this software

To exit only this software without closing the Common Platform screen, or other IQproducer™ tools, do one of these below:

- Click the Exit button ( ) on the tool bar.
- Select Exit from the File menu.
- Click the button on the upper right screen.

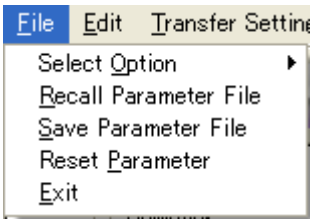


Figure 2.3.3-1 Exiting Software

The operation of the three screen buttons is explained below.

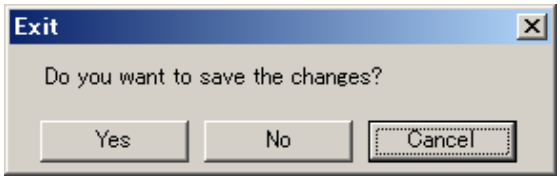


Figure 2.3.3-2 Exit Confirmation Window

- **Yes** Saves current parameters to file and stops this software.
- **No** Stops this software without saving current parameters to file.
- **Cancel** or ☒ Cancels the process and returns to the main screen.

When stopping this software using the **Yes** button, the saved parameters are read at the next start and reset for each parameter.

■When exiting entire IQproducer™ application

To exit all tools of IQproducer™ that are running, select **Exit** on the Common Platform Screen. In this case, a dialog is displayed to confirm stopping of each running tool.

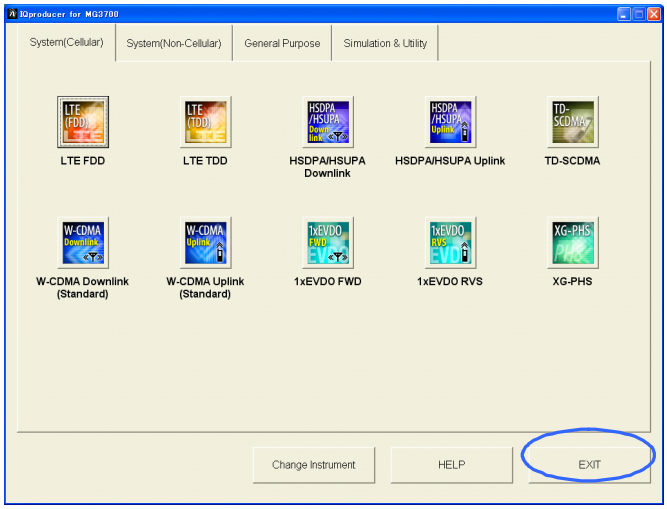


Figure 2.3.3-3 Exiting IQproducer™

Chapter 3 Detailed Description of Functions

This chapter provides detailed descriptions of this software.

Notes:

- The examples and screens used throughout this chapter are based on the assumption that the IQproducer™ is activated with the MG3700A.
- The MG3710A, MS2690A/MS2691A/MS2692A, and MS2830A functions are described as notes in each item.

3.1 Screen Details

3.1.1 Menu and tool button

On common platform screen, select the **System (Non-Cellular)** tab, and then select **Mobile WiMAX** to display the main screen.

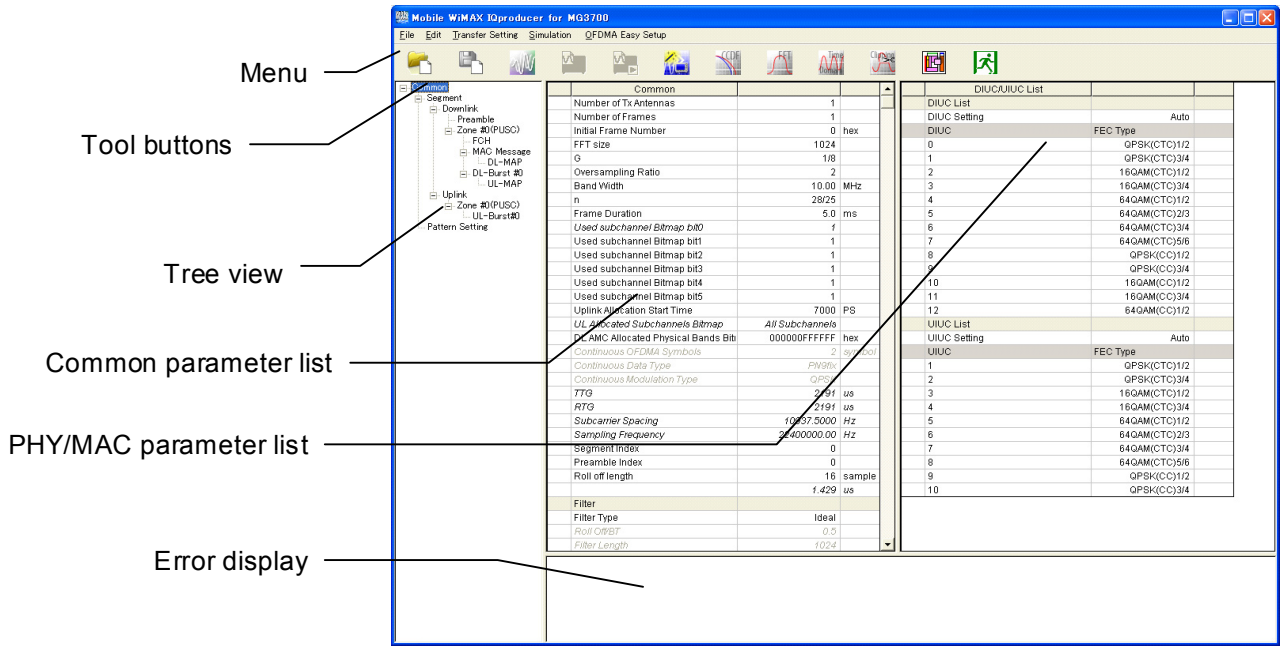


Figure 3.1.1-1 Mobile WiMAX IQproducer™ main screen

Basic operations of the main screen

- The window can be maximized, minimized, expanded, and reduced.
- For the fields of the tree view, common parameter list, PHY/MAC parameter list, and error display, splitting position can be changed by dragging their boundaries.
- The leftmost symbol of each item in the tree view is "**–**" when the integrated items are open, or "**+**" when they are closed. The state can be changed by clicking on the symbol.
- The items in italic cannot be changed. These items are automatically set. The state of each item may change depending on the setting for other items.
- The grayed out items indicate the parameters not related to the generated waveforms in the current setting and cannot be changed. The state of each item may change depending on the setting for other items.

Screen transition

Figure 3.1.1-2 shows transition from the main screen that is displayed when the Mobile WiMAX IQproducer™ is started up to other screens (Segment Edit, Export File, and Calculation screens). For details on each screen, refer to the section indicated under each screen.

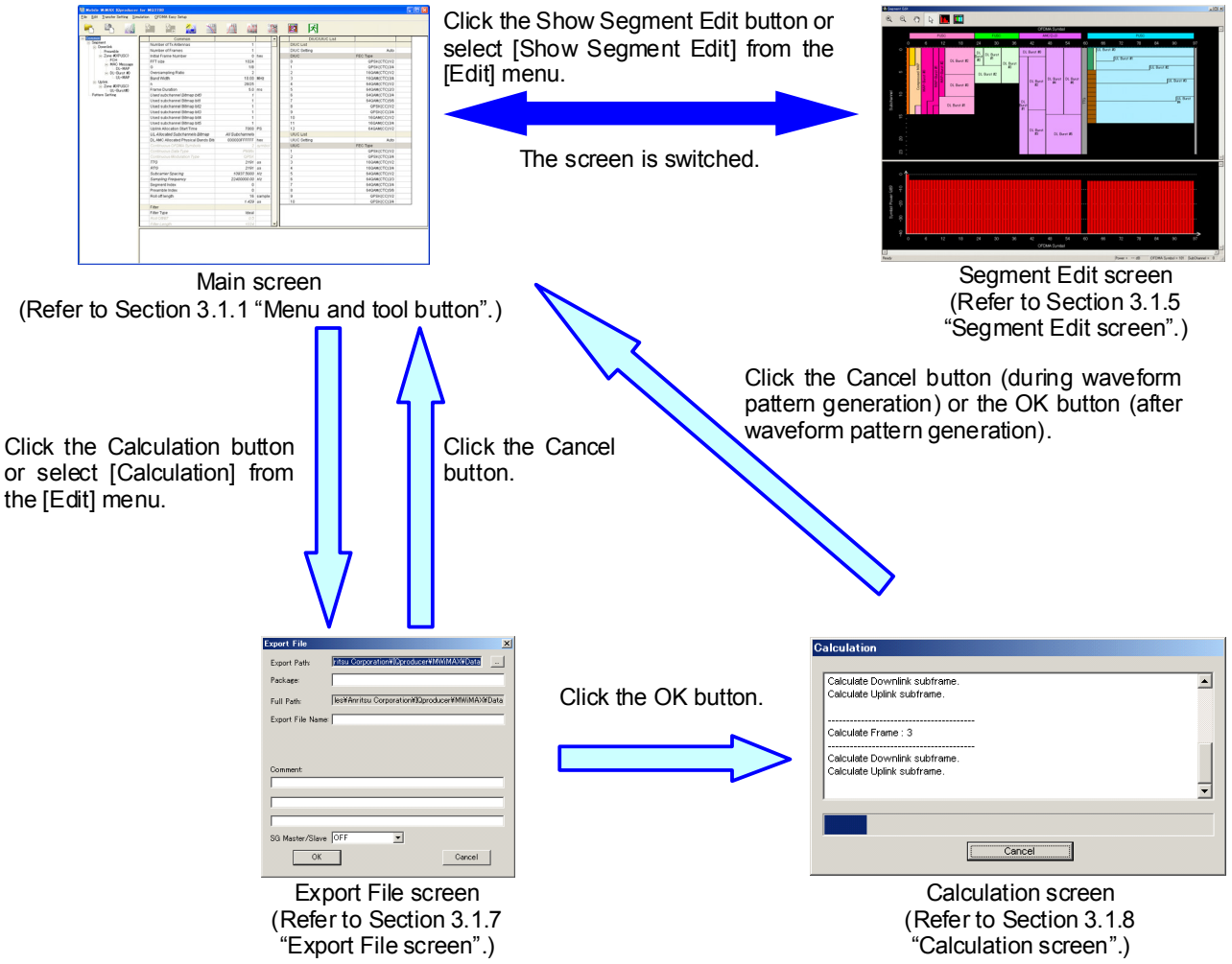


Figure 3.1.1-2 Overview of screen transition

■ The **File** menu contains the following items.

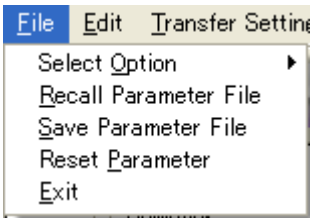


Figure 3.1.1-3 File Menu

- Select Option

  Notes:

  - This function is available only when **MG3700**, **MG3710** or **MS2830** is selected in the **Select instrument** screen.

  - ARB Memory Expansion (option) is not available for MS269xA. Only Memory 256M samples, 1 GB is available.

■ When using MG3700A or MS2830A

Select whether the ARB memory expansion option 256Msamples is installed. Selecting **With Option21 (Memory 512M samples)/With Option27 (Memory 256M samples)** supports creation of larger waveform patterns. If the ARB memory expansion option is not installed, the generated waveform pattern may not be able to be used. Waveform patterns cannot be created with a size greater than 256Msamples or 64M samples when **Without Option21 (Memory 512M samples)/Without Option27 (Memory 256M samples)** is selected. Select either according to the presence of ARB memory expansion option.

Table 3.1.1-1 Available Options for MG3700A or MS2830A

Model	Items	ARB Memory Expansion
MG3700A	With Option21 (Memory 512M samples)	1 GB x 2 memory
	Without Option21 (Memory 512M samples):	512 MB × 2 Memories
MS2830A	With Option27 (Memory 256M samples)	1 GB
	Without Option27 (Memory 256M samples)	256 MB

■ When using MG3710A

The presence/absence of the ARB Memory Expansion (option) and Baseband Signal Combination Function (option) is selected. Selecting the ARB Memory Expansion (option) and the Baseband Signal Combination Function (option) generates a bigger waveform pattern, while selecting the Baseband Signal Combination Function (option) generates a waveform pattern. If an uninstalled option is selected, sometimes the created waveform pattern may not be usable.

Set the combination of installed options based on the following setting items.

Table 3.1.1-2 Available Options for MG3710A

Items	Combinations of Options
Memory 64M samples	None
Memory 64M samples × 2	Option48 and Option 78
Memory 256M samples	Option45 or Option 75
Memory 256M samples × 2	Option 45 and Option 48 or Option 75 and Option 78
Memory 1024M samples	Option46 or Option 76
Memory 1024M samples × 2	Option 46 and Option 48 or Option 76 and Option 78

The maximum size of the generated waveform pattern for each of the setting items is shown below.

Table 3.1.1-3 Waveform Pattern Maximum Size

Items	Maximum Size
Memory 64M samples	64M samples
Memory 64M samples × 2 (With Option48, 78)	128M samples
Memory 256M samples	256M samples
Memory 256M samples × 2 (With Option48, 78)	512M samples
Memory 1024M samples	512M samples
Memory 1024M samples × 2 (With Option48, 78)	512M samples

- Recall Parameter File
  Loads the parameter files saved by the Save Parameter File menu. Setting can be facilitated by using the loaded parameters.

- Save Parameter File
  Saves the current setting parameters to a file.

- Reset Parameter
  Resets parameters to their initial settings.

- Exit
  Exits from this software.

■ The **Edit** menu contains the following items.

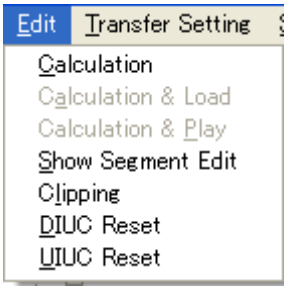


Figure 3.1.1-4 Edit Menu

- Calculation
  Generates waveform patterns.

- Calculation & Load
  Note:

  This function is available only when this software is used on MG3710A.

  After waveform generation is finished, the created waveform pattern is loaded into the MG3710A waveform memory.

- Calculation & Play
  Note:

  This function is available only when this software is used on MG3710A.

  After waveform generation is finished, the created waveform pattern is loaded and selected at the MG3710A waveform memory.

- Show Segment Edit
  Displays the Segment Edit screen.
  This item is disabled and cannot be selected if Continuous is set in Frame Duration. Refer to Section 3.1.5 “Segment Edit screen” for details on the Segment Edit screen.

- Clipping
  Displays the Clipping screen. On this screen, the generated waveform patterns can be clipped and filtered.

- DIUC Reset
  Initializes the DIUC List of the common parameter PHY/MAC. The initial settings of the DIUC List are as listed in Table 3.1.1-1 “Initial values of DIUC List”.

Table 3.1.1-1 Initial values of DIUC List

DIUC	FEC Type
0	QPSK(CTC)1/2
1	QPSK(CTC)3/4
2	16QAM(CTC)1/2
3	16QAM(CTC)3/4
4	64QAM(CTC)1/2
5	64QAM(CTC)2/3
6	64QAM(CTC)3/4
7	64QAM(CTC)5/6
8	QPSK(CC)1/2
9	QPSK(CC)3/4
10	16QAM(CC)1/2
11	16QAM(CC)3/4
12	64QAM(CC)1/2

- UIUC Reset
  Initializes the UIUC List of the common parameter PHY/MAC. The initial settings of the UIUC List are as listed in Table 3.1.1-2 "Initial values of UIUC List".

Table 3.1.1-2 Initial values of UIUC List

UIUC	FEC Type
1	QPSK(CTC)1/2
2	QPSK(CTC)3/4
3	16QAM(CTC)1/2
4	16QAM(CTC)3/4
5	64QAM(CTC)1/2
6	64QAM(CTC)2/3
7	64QAM(CTC)3/4
8	64QAM(CTC)5/6
9	QPSK(CC)1/2
10	QPSK(CC)3/4

■ The **Transfer Setting** menu contains the following items.

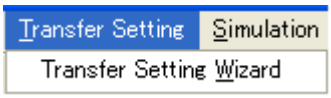


Figure 3.1.1-5 Transfer Setting menu

・ Transfer Setting Wizard

Note:

This function is available only when **MG3700** or **MG3710** is selected in the **Select instrument** screen.

Displays the Transfer Setting Wizard screen. Every operation ranging from connecting the PC and MG3700A or MG3710A and transferring the waveform pattern to the MG3700A or MG3710A, to loading the waveform pattern into the MG3700A or MG3710A ARB memory is performed at this screen.

■ The **Simulation** menu contains the following items.

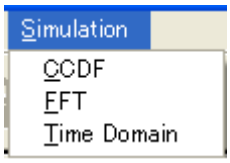


Figure 3.1.1-6 Simulation Menu

- CCDF
  Displays the CCDF Graph Monitor screen. On this screen, the CCDF of the generated waveform pattern is displayed in a graph.

- FFT
  Displays the FFT Graph Monitor screen. On this screen, the FFT-processed spectrum of the generated waveform pattern is displayed in a graph.

- Time Domain
  Displays the Time Domain graph display screen. On this screen, the time-domain waveform of the generated waveform pattern is displayed in a graph.

■ The **OFDMA Easy Setup** menu contains the following items.

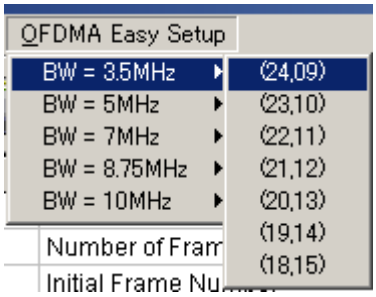


Figure 3.1.1-7 OFDMA Easy Setup Menu

- BW = 3.5 MHz to BW = 10 MHz
  Sets the number of OFDMA symbols and the band width for downlink and uplink. In the parentheses of the right subwindow, the value on the left indicates the number of OFDMA symbols for downlink and the value on the right indicates that for uplink. The number of OFDMA symbols conforms to the value defined in the Mobile WiMAX System Profile.

■ The **Tool buttons** contains the following items.

Notes:

- Transfer&Setting Wizard is available only when **MG3700** or **MG3710** is selected in the **Select instrument** screen.
- Calculation & Load and Calculation & Play are available only when this software is used on MG3710A.


Recall Parameter File


Save Parameter File


Calculation


Calculation & Load


Calculation & Play


Transfer & Setting Wizard


CCDF


FFT


Time Domain


Clipping


Show Segment Edit


Exit

Clicking a tool button operates the same as the corresponding commands in the menu.

3.1.2 Tree view

In the tree view, items can be added and deleted by selecting a menu item on the pop-up menu displayed by right-clicking on each item. Deletion of the selected item(s) is also possible, by pressing the DEL key. The PHY/MAC parameter list shows the parameter list for the items selected in the tree view. The tree view displays the items that belong to the segment to be created in the hierarchy structure.

Note:

Operation may slow down when many items are added.

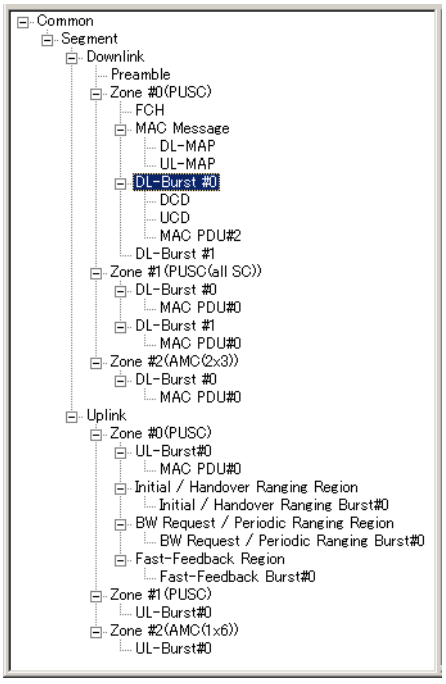


Figure 3.1.2-1 Tree view

The menu items in the pop-up menu displayed by right-clicking on each item are described below with their functions. For the correspondence between the items on the tree view and the available menu items, refer to Appendix C “Correspondence between Items on Tree View and Menu Items”. For the list of the items on the tree view and the settable parameters, refer to Appendix D “Parameter List”. Also, refer to Sections 3.1.3 “Common parameters” and 3.1.4 “PHY/MAC parameters” for details on each parameter. When Frame Duration is Continuous in the common parameter, tree view cannot be changed.

- Toggle Enable: Enables and disables the data status of the selected item. When a checkmark is displayed, the data status of that item is enabled.
- Add DCD: Adds a DCD. This menu item is displayed only when a Downlink Burst is right-clicked. It cannot be selected if a DCD already exists in the tree.
- Delete DCD: Deletes the DCD. This menu item is displayed only when a DCD is right-clicked.
- Add UCD: Adds a UCD. This menu item is displayed only when a Downlink Burst is right-clicked. It cannot be selected if a UCD already exists in the tree.
- Delete UCD: Deletes a UCD. This menu item is displayed only when a UCD is right-clicked.
- Add Downlink: Adds a Downlink. This menu item is displayed only when the Segment is right-clicked. It cannot be selected if a Downlink already exists in the tree.
- Delete Downlink: Deletes a Downlink. This menu item is displayed only when a Downlink is right-clicked.
- Add Uplink: Adds an Uplink. This menu item is displayed only when the Segment is right-clicked. It cannot be selected if an Uplink already exists in the tree.
- Delete Uplink: Deletes an Uplink. This menu item is displayed only when an Uplink is right-clicked.
- Add Preamble: Adds a Preamble. This menu item is displayed only when a Downlink is right-clicked. It cannot be selected if a Preamble already exists in the tree.
- Delete Preamble: Deletes the Preamble. This menu item is displayed only when a Preamble is right-clicked.
- Add FCH: Adds an FCH at the beginning of a frame. This menu item is displayed only when the Zone#0 of the Downlink is right-clicked. It cannot be selected if an FCH already exists in the tree.
- Delete FCH: Deletes the FCH.
  This menu item is displayed only when an FCH is right-clicked.
- Add MAC Message:
  Adds a MAC message to the Zone#0 of the Downlink. This menu item is displayed only when the Zone#0 of the Downlink is right-clicked. It cannot be selected if a MAC Message already exists in the tree.

- Delete MAC Message:
  Deletes a MAC Message.
  This menu item is displayed only when a MAC Message is right-clicked.
- Add Zone: Adds a Zone. This menu item is displayed only when the Downlink or Uplink is right-clicked. The Permutation of the Zone immediately after the addition is PUSC.
  Up to eight Zones can be added for each of the Uplink and Downlink.
- Copy Zone: Adds a copy of the selected Zone. The number of the added Zone is the smallest among the unused Zone numbers.
- Delete Zone: Deletes the selected Zone. This menu item cannot be selected for the Zone#0 of the Downlink and Uplink.
- Add Sounding Zone:
  Adds a Sounding Zone. This menu item is displayed when the Uplink is right-clicked. It cannot be selected if a Sounding Zone already exists in the tree.
- Delete Sounding Zone:
  Deletes a Sounding Zone. This menu item is displayed when a Sounding Zone is right-clicked.
- Add Sounding Symbol:
  Adds a Sounding Symbol to Sounding Zone. This menu item can be selected when a Sounding Zone is right-clicked.
  Up to eight Sounding Symbols can be added.
- Delete Sounding Symbol:
  Deletes the selected Sounding Symbol. Note that Sounding Symbol#0 cannot be deleted.
- Add CID: Adds a CID to the selected Sounding Symbol. The number of the added CID is the smallest among the unused CID numbers in the same Sounding Symbol. Up to 128 CIDs can be added to one Sounding Symbol.
- Delete CID: Deletes the selected CID. Note that CID#0 cannot be deleted.

- Add Burst: Adds a Burst to the selected Zone. This menu item can be selected only when a Zone is right-clicked. The number of the added Burst is the smallest among the unused Burst numbers in the same Zone. Up to 16 Bursts can be added to one Zone.
- Copy Burst: Adds a copy of the selected Burst. The number of the added Burst is the smallest among the unused Burst numbers.
- Delete Burst: Deletes the selected Burst.
  Note that the Burst#0 added to a Zone cannot be deleted.
- Add MAP-Burst: Adds a MAP-Burst to the selected Downlink Zone. This menu item can be selected only when a Zone is right-clicked. The number of the added MAP-Burst is the smallest among the unused MAP-Burst numbers in the same Zone.
  Up to three MAP-Bursts can be added to one Zone.
- Copy MAP-Burst: Adds a copy of the selected MAP-Burst. The number of the added MAP-Burst is the smallest among the unused MAP-Burst numbers.
- Delete MAP-Burst: Deletes the selected MAP-Burst.
- Add DL-HARQ Burst:
  Adds a DL-HARQ Burst to the selected Downlink Zone. This menu item can be selected only when a Downlink Zone is right-clicked. The number of the added DL-HARQ Burst is the smallest among the unused DL-HARQ Burst numbers in the same Zone. Up to 16 DL-HARQ Bursts can be added to one Zone.
- Delete DL-HARQ Burst:
  Deletes the selected DL-HARQ Burst.
- Add UL-HARQ Burst:
  Adds a UL-HARQ Burst to the selected Uplink Zone. This menu item can be selected only when an Uplink Zone is right-clicked. The number of the added UL-HARQ Burst is the smallest among the unused UL-HARQ Burst numbers in the same Zone. Up to 16 UL-HARQ Bursts can be added to one Zone.
- Delete UL-HARQ Burst:
  Deletes the selected UL-HARQ Burst.

- Add Sub-Burst:

  Adds a Sub-Burst to the selected DL-HARQ Burst or UL-HARQ Burst.
  For the DL-HARQ Burst, a Sub-Burst cannot be added if there is not enough capacity left for a new Sub-Burst to be added to the DL-HARQ Burst.
  For the UL-HARQ Burst, a Sub-Burst is added to the end of the UL-HARQ Burst.
  Up to 16 Sub-Bursts can be added to one DL-HARQ Burst or UL-HARQ Burst.

- Delete Sub-Burst:

  Deletes the selected Sub-Burst. Note that Sub-Burst#0 cannot be selected.

- Add MAC PDU: Adds a MAC PDU to the selected Burst, MAP-Burst or Sub-Burst. This menu item can be selected only when a Burst, MAP-Burst or Sub-Burst is right-clicked. The number of the added MAC PDU is the smallest among the unused MAC PDU numbers in the Burst to which these MAC PDUs belong.
  Up to 32 MAC PDUs, including DCD and UCD, can be added to one Burst.

- Delete MAC PDU: Deletes the selected MAC PDU.

- Copy MAC PDU: Adds a copy of the selected MAC PDU. The number of the added MAC PDU is the smallest among the unused MAC PDU numbers in the Burst to which these MAP PDUs belong.

- Add DL-MAP: Adds a DL-MAP. This menu item can be selected only when a MAC Message is right-clicked. It cannot be selected if a DL-MAP already exists in the tree. The DL-MAP is added immediately after the FCH. If no FCH exists, it is added to the beginning of the frame.

- Delete DL-MAP: Deletes a DL-MAP.
  This menu item can be selected only when a DL-MAP is right-clicked.

- Add UL-MAP: Adds a UL-MAP. This menu item can be selected only when the Burst#0 or MAC Message of the Zone#0 of the Downlink is right-clicked. A DL-MAP must exist in the MAC Message and a DL-MAP Type must be set to the Compressed DL-MAP before adding a UL-MAP to a MAC Message. It

cannot be selected if a UL-MAP already exists in the tree view.

- Delete UL-MAP: Deletes a UL-MAP.
  This menu item is displayed only when a UL-MAP is right-clicked.
- Add SUB-DL-UL-MAP:
  Adds a SUB-DL-UL-MAP to the selected Downlink Zone. This menu item can be selected when a MAC Message is right-clicked. The DL-MAP Type must be set to Compressed DL-MAP before a SUB-DL-UL-MAP is added. Up to three SUB-DL-UL-MAPs can be added.
- Delete SUB-DL-UL-MAP:
  Deletes the selected SUB-DL-UL-MAP. This menu item can be selected when a SUB-DL-UL-MAP is right-clicked.
- Add Initial/Handover Ranging Region:
  Adds an Initial/Handover Ranging Region. This menu item is displayed only when a Downlink Zone is right-clicked. It cannot be selected if an Initial/Handover Ranging Region already exists in the tree view or FFT size is set to 128.
- Delete Initial/Handover Ranging Region:
  Deletes an Initial/Handover Ranging Region. This menu item is displayed only when an Initial/Handover Ranging Region is right-clicked.
- Add BW Request/Periodic Ranging Region:
  Adds a BW Request/Periodic Ranging Region. This menu item is displayed only when an Uplink Zone is right-clicked. It cannot be selected if a BW Request/Periodic Ranging Region already exists in the tree view or FTP size is set to 128 or the Ranging Region Combination for the Initial/Handover Ranging Region is set to “Combine”.
- Delete BW Request/Periodic Ranging Region:
  Deletes a BW Request/Periodic Ranging Region. This menu item is displayed only when a BW Request/Periodic Ranging Region is right-clicked.

- Add Fast-Feedback Region:

  Adds a Fast-Feedback Region. This menu item is displayed only when an Uplink Zone for which Permutation is set to PUSC or PUSC (w/o SC rotation) is right-clicked. It cannot be selected if a Fast-Feedback Region already exists in the tree view or FTP size is set to 128.

- Delete Fast-Feedback Region:

  Deletes a Fast-Feedback Region. This menu item is displayed only when a Fast-Feedback Region is right-clicked.

- Add Initial/Handover Ranging Burst:

  Adds an Initial/Handover Ranging Burst to an Initial/Handover Ranging Region. This menu item is displayed only when an Initial/Handover Ranging Region is right-clicked. The number of the added Initial/Handover Ranging Burst is the smallest among the unused Initial/Handover Ranging Burst numbers in the Initial/Handover Ranging Region.
  Up to 16 Initial/Handover Ranging Bursts can be added.

- Delete Initial/Handover Ranging Burst:

  Deletes an Initial/Handover Ranging Burst. Note that deletion is impossible if only one Initial/Handover Ranging Burst exists in the Initial/Handover Ranging Region.

- Add BW Request/Periodic Ranging Burst:

  Adds a BW Request/Periodic Ranging Burst to an Initial/Handover Ranging Region or a BW Request/ Periodic Ranging Region. When adding a BW Request/Periodic Ranging Burst to an Initial/ Handover Ranging Region, the Ranging Region Combination must be set to “Combine”.
  The number of the added BW Request/Periodic Ranging Burst is the smallest among the unused BW Request/Periodic Ranging Burst numbers in the Region.
  Up to 16 BW Request/Periodic Ranging Bursts can be added.

- Delete BW Request/Periodic Ranging Burst:

  Deletes a BW Request/Periodic Ranging Burst. Note that deletion is impossible if only one BW Request/Periodic Ranging Burst exists in the Region.

- Add Fast-Feedback Burst:

  Adds a Fast-Feedback Burst to a Fast-Feedback Region. This menu item is displayed only when a Fast-Feedback Region is right-clicked. The number of the added Fast-Feedback Burst is the smallest among the unused Fast-Feedback Burst numbers in the Fast-Feedback Region.
  Up to 32 Fast-Feedback Bursts can be added.

- Delete Fast-Feedback Burst:

  Deletes a Fast-Feedback Burst. Note that deletion is impossible if only one Fast-Feedback Burst exists in the Fast-Feedback Region.

- Add UL-ACK Region:

  Adds a UL-ACK Region.
  This menu item is displayed when a Zone is right-clicked with Permutation in the Uplink set to PUSC or PUSC (w/o SC rotation). It cannot be selected if a UL-ACK Region already exists in the tree.

- Delete UL-ACK Region:

  Deletes the UL-ACK Region.
  This menu item can be selected when a UL-ACK Region is right-clicked.

- Add UL-ACK Burst:

  Adds a UL-ACK Burst to the UL-ACK Region. This menu item can be selected when a UL-ACK Region is right-clicked. The number of the added Burst is the smallest among the unused UL-ACK Burst numbers in the UL-ACK Region.
  Up to 32 UL-ACK Bursts can be added.

- Delete UL-ACK Burst:

  Deletes the UL-ACK Burst.
  This menu item can be selected when a UL-ACK Burst is right-clicked. Note that deletion is impossible if only one UL-ACK Burst exists in the UL-ACK Region.

3.1.3 Common parameters

The items displayed in the common parameter list are described below. The common parameter list contains parameters that need to be set regardless of whether or not Bursts or MAC messages are mapped. The common parameters are displayed under Common. Values with the prefix "0x" are hexadecimal data, and values without the prefix "0x" are decimal data.

Number of Tx Antennas

[Function] Sets the number of Tx antennas.
[Default] 1
[Setting range] 1 or 2
[Remark] Refer to Section 3.2.4 "STC/MIMO" for details.

Number of Frames

[Function] Sets the number of frames to be generated.
[Default] 1
[Setting range] Up to the maximum number of frames that can be stored in the waveform memory
[Remark] Example: Up to 4793 frames can be set under the following condition: FFT size = 1024, Band Width = 10.00 MHz, n = 28/25, Frame Duration = 5 ms, Oversampling Ratio = 2, With Option 21 (Memory 512Msamples).
This parameter cannot be edited when Frame Duration = Continuous.
When the maximum number to be saved is exceeded by changing other parameters, it is reset to 1.

Initial Frame Number

[Function] Sets the initial value for the Frame Number.
[Default] 0x000000
[Setting range] 0x000000 to 0xFFFFFF
[Remark] This parameter cannot be edited when Frame Duration = Continuous.

FFT size

[Function] Sets the FFT point count.
[Default] 1024
[Setting range] 128, 512, 1024, 2048

G

[Function] Sets the CP time ratio.
[Default] 1/8
[Setting range] 1/4, 1/8, 1/16, 1/32
[Remark]

Oversampling Ratio

[Function] Sets the oversampling ratio.
[Default] 2
[Setting range] 2, 4, 8
[Remark] An oversampling ratio that makes the sampling frequency to 160 MHz or more cannot be set. If the sampling frequency becomes 160 MHz or more as a result of changing the oversampling ratio, this parameter is reset to 2.

Band Width

[Function] Sets the bandwidth.
[Default] 10.00 MHz
[Setting range] 1.25, 1.50, 1.75, 2.50, 3.00, 3.50, 5.00, 6.00, 7.00, 8.75, 10.00, 12.00, 14.00, 15.00, 17.50, 20.00, 24.00, 28.00 MHz

n

[Function] Sets the sampling factor.
[Default] 28/25
[Setting range] 8/7, 28/25
[Remark] According to the definition in the Mobile WiMAX System Profile, the sampling factor is set to 8/7 if the Band Width is set to a multiple of 1.75 MHz (1.75, 3.50, 7.00, 8.75, 14.00, 17.50, or 28.00 MHz). Otherwise, that is, if the Band Width is set to a multiple of 1.25, 1.50, 2.00, or 2.75 MHz (1.25, 1.50, 2.50, 3.00, 5.00, 6.00, 10.00, 12.00, 15.00, 20.00, or 24.00 MHz), the sampling factor is set to 28/25.

Frame Duration

[Function] Sets the frame duration.
[Default] 5.0 ms
[Setting range] 2.0, 2.5, 4.0, 5.0, 8.0, 10.0, 12.5, 20.0 ms, Continuous
[Remark] When a waveform pattern is created with Frame Duration set to Continuous, the OFDMA waveform pattern with the Subchannel set in Used subchannel Bitmap bits 0 to 5 turned On.

The parameters that must be set when Frame Duration is set to Continuous are FFT size, G, Oversampling Ratio, Band Width, n, Used subchannel Bitmap bits 0 to 5, Continuous OFDMA Symbols, Continuous Data Type, Continuous Modulation Type, Roll off length, Filter Type, Roll Off/BT, and Filter Length. The other parameters are invalid.
The arrangement of Pilot Subcarriers in a Continuous waveform pattern is the same as DL PUSC. No MAC Message such as Preamble, FCH, or DL-MAP is added to the Continuous waveform pattern. When Frame Duration is Continuous, tree view cannot be changed.

Used subchannel Bitmap bit0 to bit5

[Function] Sets the subchannel group used for Downlink PUSC.

[Default] (except FFT size = 512, 128)
Used subchannel Bitmap bit0: 1
Used subchannel Bitmap bit1: 1
Used subchannel Bitmap bit2: 1
Used subchannel Bitmap bit3: 1
Used subchannel Bitmap bit4: 1
Used subchannel Bitmap bit5: 1
(FFT size = 512, 128)
Used subchannel Bitmap bit0: 1
Used subchannel Bitmap bit1: 0 (This setting cannot be changed.)
Used subchannel Bitmap bit2: 1
Used subchannel Bitmap bit3: 0 (This setting cannot be changed.)
Used subchannel Bitmap bit4: 1
Used subchannel Bitmap bit5: 0 (This setting cannot be changed.)

[Setting range] 1, 0

[Remark] This parameter is applied to all the Downlink PUSC zones, except for PUSC (all SC).
Any value other than 1 cannot be selected for bit 0 when Segment Index = 0, bit 2 when Segment Index = 1, and bit 4 when Segment Index = 2.

Uplink Allocation Start Time

[Function] Sets the delay for the starting timing of the Uplink subframes with respect to the frame starting timing.

[Default] 7000 PS

[Setting range] 0 to Frame End PS

[Remark] This parameter cannot be edited when Frame Duration = Continuous.
Refer to Section 3.2.2 “Uplink Allocation Start Time setting method” for details on the setting method.

UL Allocated Subchannels bitmap

[Function] Displays the number of subchannels used in Uplink.
[Default] All Subchannels
[Setting range] Display only
[Remark] This parameter is fixed to All Subchannels and cannot be changed.

DL AMC Allocated Physical Bands Bitmap

[Function] Sets the Physical Band to be allocated to the Zone in which Downlink Permutation is set to AMC (2x3).
[Default] 000000FFFFFF
[Setting range] When FFT size = 2048:
000000000000 to FFFFFFFFFFFF

When FFT size = 1024:
000000000000 to 000000FFFFFF

When FFT size = 512:
000000000000 to 000000000FFF

When FFT size = 128:
000000000000 to 000000000007

[Remark] This setting applies to all Zones in which Downlink Permutation is set to AMC (2x3).

Continuous OFDMA Symbols

[Function] Sets the number of OFDMA symbols of the continuous wave when Continuous is selected.
[Default] 2 symbols
[Setting range] From 2, up to the maximum number of OFDMA Symbol that can be stored in the waveform memory
[Remark] This parameter can be edited only when Frame Duration = Continuous.
It can be edited in the multiple of 2 symbols.
When the maximum number to be saved is exceeded by changing other parameters, it is reset to 2.

Continuous Data Type

[Function] Sets the data when Continuous is selected.

[Default] PN9fix

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, User File

[Remark] This parameter is valid only when Frame Duration = Continuous.
Neither Coding nor Randomization is performed for the data selected here.
When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of the waveform pattern to be generated. The PN data therefore does not have continuity between the end of a waveform pattern and the start of the next waveform pattern.
Refer to Appendix B "User File Format" for details on the user file format.

Continuous Data Type Repeat Data

[Function] Sets the data when Continuous Data Type = 16 bit repeat.

[Default] 0x0000

[Setting range] 0x0000 to 0xFFFF

[Remark] This parameter is displayed only when Continuous Data Type = 16 bit repeat.

Continuous Data Type User File

[Function] Sets the user file when Continuous Data Type = User File.

[Remark] This parameter is displayed only when Continuous Data Type = User File.

Continuous Modulation Type

[Function] Sets the primary modulation type when Continuous is selected.

[Default] QPSK

[Setting range] QPSK, 16QAM, 64QAM

[Remark] This parameter is valid only when Frame Duration = Continuous.

TTG

[Function] Displays the gap interval between Downlink and Uplink.

[Setting range] Displays the calculated value.

RTG

[Function] Displays the gap interval between Uplink and Frame End.

[Setting range] Displays the calculated value.

Subcarrier Spacing

[Function] Displays the subcarrier spacing.

[Setting range] Displays the value.

Sampling Frequency

[Function] Displays the sampling frequency.

[Setting range] Displays the value.

[Remark] This parameter changes depending on the settings of Band Width, n (Sampling Factor), and Oversampling Ratio.

Segment Index

[Function] Sets the segment number.

[Default] 0

[Setting range] 0, 1, 2

[Remark] This parameter cannot be edited when Frame Duration = Continuous.

Preamble Index

[Function] Sets the preamble index. The setting range changes depending on Segment Index. When Preamble Index is set, IDcell is also set automatically.

[Default] 0 (IDcell=0)

[Setting range] (When Segment Index = 0)
0 (IDcell=0), 1 (IDcell=1), 2 (IDcell=2), 3 (IDcell=3), 4 (IDcell=4), 5 (IDcell=5), 6 (IDcell=6), 7 (IDcell=7), 8 (IDcell=8), 9 (IDcell=9), 10 (IDcell=10), 11 (IDcell=11), 12 (IDcell=12), 13 (IDcell=13), 14 (IDcell=14), 15 (IDcell=15), 16 (IDcell=16), 17 (IDcell=17), 18 (IDcell=18), 19 (IDcell=19), 20 (IDcell=20), 21 (IDcell=21), 22 (IDcell=22), 23 (IDcell=23), 24 (IDcell=24), 25 (IDcell=25), 26 (IDcell=26), 27 (IDcell=27), 28 (IDcell=28), 29 (IDcell=29) , 30 (IDcell=30), 31 (IDcell=31), 96 (IDcell=0), 99 (IDcell=3), 102 (IDcell=6), 105 (IDcell=9), 108 (IDcell=12), 111 (IDcell=15)
(Segment Index = 1)
32 (IDcell=0), 33 (IDcell=1), 34 (IDcell=2), 35 (IDcell=3), 36 (IDcell=4), 37 (IDcell=5), 38 (IDcell=6), 39 (IDcell=7), 40 (IDcell=8), 41 (IDcell=9), 42 (IDcell=10), 43 (IDcell=11), 44 (IDcell=12), 45 (IDcell=13), 46 (IDcell=14), 47 (IDcell=15), 48 (IDcell=16), 49 (IDcell=17), 50 (IDcell=18), 51 (IDcell=19),

52 (IDcell=20), 53 (IDcell=21), 54 (IDcell=22), 55 (IDcell=23),
56 (IDcell=24), 57 (IDcell=25), 58 (IDcell=26), 59 (IDcell=27),
60 (IDcell=28), 61 (IDcell=29), 62 (IDcell=30), 63 (IDcell=31),
97 (IDcell=1), 100 (IDcell=4), 103 (IDcell=7), 106 (IDcell=10),
109 (IDcell=13), 112 (IDcell=16)
(Segment Index = 2)
64 (IDcell=0), 65 (IDcell=1), 66 (IDcell=2), 67 (IDcell=3),
68 (IDcell=4), 69 (IDcell=5), 70 (IDcell=6), 71 (IDcell=7),
72 (IDcell=8), 73 (IDcell=9), 74 (IDcell=10), 75 (IDcell=11),
76 (IDcell=12), 77 (IDcell=13), 78 (IDcell=14), 79 (IDcell=15),
80 (IDcell=16), 81 (IDcell=17), 82 (IDcell=18), 83 (IDcell=19),
84 (IDcell=20), 85 (IDcell=21), 86 (IDcell=22), 87 (IDcell=23),
88 (IDcell=24), 89 (IDcell=25), 90 (IDcell=26), 91 (IDcell=27),
92 (IDcell=28), 93 (IDcell=29), 94 (IDcell=30), 95 (IDcell=31),
98 (IDcell=2), 101 (IDcell=5), 104 (IDcell=8), 107 (IDcell=11),
110 (IDcell=14), 113 (IDcell=17)

[Remark] This parameter cannot be edited when Frame Duration = Continuous.

Roll off length

[Function] Sets the length of the window function applied to the symbol guard segment.

[Default] 16 samples

[Setting range] 0 to 32

[Remark] The length where the window function is applied is displayed on a time basis in the field below.
The unit “sample” is defined as “sample = 1/Fs”, where Fs = Sampling Frequency/Oversampling ratio.
The roll-off length can be set so that the window function is applied so as to exceed the symbol guard segment. For example, if FFT Size, G, and Roll off length are set to 128, 1/16, and 16, respectively, the roll-off length is 16 samples while CP is 8 samples. When setting the roll-off length, therefore, be careful not to set a too long a roll-off length when FFT Size is set to 128.

Filter

Filter Type

[Function] Sets the filter type.

[Default] Ideal

[Setting range] Non, Gaussian, Root Nyquist, Nyquist, Ideal

[Remark] The output level may be lowered if a filter that narrows the signal bandwidth is selected.

Roll Off/BT

[Function] Sets the roll off rate or bandwidth time (BT).
[Default] 0.5
[Setting range] 0.1 to 1.0
[Remark] The setting changes between the Roll Off value (for Root Nyquist or Nyquist) and BT product (for Gaussian), depending on the setting of Filter Type.
This parameter cannot be edited when Filter Type = Non or Ideal.

Filter Length

[Function] Sets the symbol length of the filter.
[Default] 1024
[Setting range] 1 to 1024
[Remark] This parameter cannot be edited when Filter Type = Non or Ideal.

DLFP

Repetition Coding Indication

[Function] Sets the Repetition Coding Indication used for DL-MAP.
[Default] No repetition
[Setting range] No repetition, 2, 4, 6
[Remark] This parameter cannot be edited when Frame Duration = Continuous.

Coding Indication

[Function] Sets the Coding Indication used for DL-MAP.
[Default] CC
[Setting range] CC, CTC
[Remark] This parameter cannot be edited when Frame Duration = Continuous.

3.1.4 PHY/MAC parameters

The items displayed in the PHY/MAC parameter list are described below. When Frame Duration is Continuous in the common parameter, PHY/MAC parameters cannot be changed.

3.1.4.1 Common

When Common is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

DIUC List

DIUC Setting

[Function] Sets the setting method of DIUC in DL-MAP IE.

[Default] Auto

[Setting range] Auto, Manual

[Remark] When set to Auto, the DIUC value of the DL-MAP IE included in DL-MAP is set automatically according to the FEC Code Type and Modulation Type in the DL-Burst that corresponds to the DL-MAP IE.
When set to Manual, the DIUC value of the DL-MAP IE can be entered manually.

DIUC List

[Function] Relates DIUC and FEC Code Type and Modulation.

[Default] DIUC

DIUC	FEC Type
0	QPSK(CTC)1/2
1	QPSK(CTC)3/4
2	16QAM(CTC)1/2
3	16QAM(CTC)3/4
4	64QAM(CTC)1/2
5	64QAM(CTC)2/3
6	64QAM(CTC)3/4
7	64QAM(CTC)5/6
8	QPSK(CC)1/2
9	QPSK(CC)3/4
10	16QAM(CC)1/2
11	16QAM(CC)3/4
12	64QAM(CC)1/2

[Setting range] QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6

[Remark] When DIUC Setting is set to Auto, the DIUC value related to FEC Code Type and Modulation Type of the DL-Burst corresponding to the DL-MAP IE is set automatically as the DIUC value of the DL-MAP IE. When the DL-Burst of FEC Code Type and Modulation Type is not related to DIUC, the DIUC corresponding to the DL-MAP IE is set to 0.

UIUC List

UIUC Setting

[Function] Sets the setting method of UIUC in UL-MAP IE.

[Default] Auto

[Setting range] Auto, Manual

[Remark] When set to Auto, the UIUC value of the UL-MAP IE included in UL-MAP is set automatically according to the FEC Code Type and Modulation Type in the UL-Burst that corresponds to the UL-MAP IE.
When set to Manual, the UIUC value of the UL-MAP IE can be entered manually.

UIUC List

[Function] Relates UIUC and FEC Code Type and Modulation.

[Default] UIUC

UIUC	FEC Type
1	QPSK(CTC)1/2
2	QPSK(CTC)3/4
3	16QAM(CTC)1/2
4	16QAM(CTC)3/4
5	64QAM(CTC)1/2
6	64QAM(CTC)2/3
7	64QAM(CTC)3/4
8	64QAM(CTC)5/6
9	QPSK(CC)1/2
10	QPSK(CC)3/4

[Setting range] QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6

[Remark] When the UIUC Setting is set to Auto, the UIUC value related to FEC Code Type and Modulation Type of the UL-Burst corresponding to the UL-MAP IE is set automatically as the UIUC value of the UL-MAP IE. When the DL-Burst of FEC Code Type and Modulation Type is not related to UIUC, the UIUC corresponding UL-MAP IE is set to 0.

3.1.4.2 Segment

When Segment is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Multi-Path setting

[Function] Enables and disables the Multi-Path function.

[Default] Disable

[Setting range] Enable, Disable

[Remark] When the Multi-Path function is enabled, a waveform pattern for which the multi-path processing is performed is generated according to the settings of Tx Antenna 0 (Tx Antennas 0 and 1 if Number of Tx Antennas is set to 2). Refer to Section 3.2.5 “Multi-path processing” for details on the multi-path processing.

Tx Antenna 0, 1

[Function] Sets the multi-path parameters for a Tx Antenna.

[Default] Multi-Path Number = 5
Delay = 0.0 ns
Phase = 0.0 deg
Gain = 0.0 dB

[Setting range] Multi-Path Number: 1 to 20
Delay: 0.0 to 10000.0 ns
Phase: 0.0 to 359.9 deg
Gain: –80.0 to 0.0 dB

[Remark] The multi-path parameters can be set for Tx Antenna 0 only when Number of Tx Antennas is set to 1, while the multi-path parameters can be set for both Tx Antennas 0 and 1 when Number of Tx Antennas is set to 2. Refer to Section 3.2.5 “Multi-path processing” for details on the multi-path processing.

3.1.4.3 Downlink

When Downlink is selected in the tree view, the following item is displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the Downlink.
[Default] Enable
[Setting range] Enable, Disable
[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the Downlink is created. In this event, however, error evaluation for downlink is still executed.

3.1.4.4 Preamble

When Preamble is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the Preamble.
[Default] Enable
[Setting range] Enable, Disable
[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the Preamble is created.

Preamble Index

[Function] Displays the setting value of the parameter of the same name in the common parameter list.
[Default] 0 (IDcell=0)
[Setting range] Display only

IDcell

[Function] Displays IDcell determined depending on the setting of Preamble Index.
[Default] 0
[Setting range] Display only

3.1.4.5 FCH

When a FCH is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the FCH.
[Default] Enable
[Setting range] Enable, Disable
[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the FCH is created. In this event, however, error evaluation for FCH is still executed.

FCH Type

[Function] Sets the data to be inserted to the FCH.
[Default] DLFP
[Setting range] 16 bit repeat, PN9fix, PN15fix, DLFP, User File
[Remark] When DLFP is selected, the data of the FCH shown in Section 3.2.1 is set.
When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of the waveform pattern to be generated. The PN data therefore does not have continuity between the end of a waveform pattern and the start of the next waveform pattern.
Refer to Appendix B “User File Format” for details on the user file format.

FCH Type Repeat Data

[Function] Sets the data to be inserted to the FCH when FCH Type = 16 bit repeat.
[Default] 0x0000
[Setting range] 0x0000 to 0xFFFF
[Remark] This parameter is displayed only when FCH Type = 16 bit repeat.

FCH Type User File

[Function] Sets the user file when FCH Type = User File.
[Remark] This parameter is displayed only when FCH Type = User File.

Used subchannel Bitmap bits0 to 5

[Function] Displays the setting of Used subchannel Bitmap Bits0 to 5.

[Setting range] Display only

[Remark] Displays the setting values of the common parameters Used subchannel Bitmap bits0 to 5.

Repetition Coding Indication

[Function] Displays the Repetition Coding used for DL-MAP.

[Setting range] Display only

[Remark] Displays the setting value of Repetition Coding Indication in the common parameter DLFP.

Coding Indication

[Function] Displays the Coding Indication used for DL-MAP.

[Setting range] Display only

[Remark] Displays the setting value of Coding Indication in the common parameter DLFP.

DL-MAP Length

[Function] Displays the DL-MAP length.

[Setting range] Display only

[Remark] Displays DL-MAP length set in Section 3.1.4.7 “DL-MAP”.

3.1.4.6 MAC Message

Data Status

[Function] Enables and disables the MAC message.

[Default] Enable

[Setting range] Enable, Disable

3.1.4.7 DL-MAP

Data Status

[Function] Enables and disables the DL-MAP.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the DL-MAP is created. In this event, however, error evaluation for DL-MAP is still executed.

DL-MAP Type

[Function] Sets the data to be inserted to DL-MAP.

[Default] DL-MAP

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, DL-MAP, Compressed DL-MAP, User File

[Remark] If DL-MAP is selected, the data shown in the DL-MAP format in Section 3.2.1 will be set. If Compressed DL-MAP is selected, the data in the Compressed DL-MAP format in Section 3.2.1 will be set. If any value other than DL-MAP or Compressed DL-MAP is selected, the selected data without any Header or CRC added will be mapped to the DL-MAP field. If it is set to any value other than DL-MAP and Compressed DL-MAP, the data of the DL-MAP remains continuous over the number of frames set in the common parameter Number of Frames. For example, if Number of Frames is set to a value greater than or equal to 2 and DL-MAP Type is set to PN9fix, the data following the DL-MAP data of the first frame is mapped to the data of the DL-MAP of the next frame.
Only Compressed DL-MAP can be selected if the UL-MAP or SUB-DL-UL MAP is added to MAC Message.
When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of the waveform pattern to be generated. The PN data therefore does not have continuity between the end of a waveform pattern and the start of the next waveform pattern.
Refer to Appendix B “User File Format” for details on the user file format.

DL-MAP Type Repeat Data

[Function] Sets the data when DL-MAP Type = 16 bit repeat.

[Default] 0x0000

[Setting range] 0x0000 to 0xFFFF

[Remark] This parameter is displayed only when DL-MAP Type = 16 bit repeat.

DL-MAP Type User File

[Function] Sets the user file when DL-MAP Type = User File.

[Remark] This parameter is displayed only when DL-MAP Type = User File.

DL-MAP Length

[Function] Sets the slot count of DL-MAP.

[Setting range] 0 to 255 slots

[Remark] Display only when DL-MAP Type is DL-MAP or Compressed DL-MAP. If any value other than DL-MAP or Compressed DL-MAP is selected, the data length of the DL-MAP is set. If the specified DL-MAP Length is not a multiple of the Repetition Coding Indication set in the common parameter DLFP, an error occurs.

DCD Count

[Function] Sets the DCD Count.

[Default] 0

[Setting range] 0 to 255

[Remark] Valid when DL-MAP Type is DL-MAP or Compressed DL-MAP.

Base Station ID

[Function] Sets the Base Station ID.

[Default] 0x0000 0000 0000

[Setting range] 0x0000 0000 0000 to 0xFFFF FFFF FFFF

[Remark] Valid when DL-MAP Type is DL-MAP or Compressed DL-MAP.

DL-MAP PHY Synchronization Field

Frame Duration

[Function] Displays the setting value of the parameter of the same name in the common parameter list.

[Setting range] Display only

Initial Frame Number

[Function] Displays the setting value of the parameter of the same name in the common parameter list.

[Setting range] Display only

DL-MAP IE

DIUC

[Function] Sets the downlink interval usage code (DIUC).

[Default] 0

[Setting range] 0 to 12

[Remark] When DIUC Setting is set to Auto in the common PHY/MAC parameter list, DIUC is set automatically and cannot be edited.

OFDMA Symbol Offset

[Function] Displays the setting value of the parameter of the same name in DL-Burst.

[Setting range] Display only

OFDMA Subchannel Offset

[Function] Displays the setting value of the parameter of the same name in DL-Burst.

[Setting range] Display only

Boosting

[Function] Displays the setting value of the parameter of the same name in DL-Burst.

[Setting range] Display only

No. OFDMA Symbols

[Function] Displays the setting value of the parameter of the same name in DL-Burst.

[Setting range] Display only

No. Subchannels

[Function] Displays the setting value of the parameter of the same name in DL-Burst.

[Setting range] Display only

Repetition Coding Indication

[Function] Displays the setting value of the parameter of the same name in DL-Burst.

[Setting range] Display only

STC/Zone switch IE

For STC/Zone switch IEs, the STC/Zone switch IE of Zone#0 is not included in DL-MAP.

OFDMA Symbol Offset

[Function] Displays the setting value of the parameter of the same name in DL-Zone.

[Setting range] Display only

Permutation

[Function] Displays the setting value of the parameter of the same name in DL-Zone.

[Setting range] Display only

DL Use All SC Indicator

[Function] Displays “All” when Permutation is set to PUSC (all SC). Otherwise, displays “Not All”.

[Setting range] Display only

DL-PermBase

[Function] Displays the setting value of the parameter of the same name in DL-Zone.

[Setting range] Display only

3.1.4.8 UL-MAP

When a UL-MAP is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the UL-MAP.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the UL-MAP is created. In this event, however, error evaluation for UL-MAP is still executed.

UL-MAP Type

[Function] Sets the data to be inserted to UL-MAP.

[Default] UL-MAP

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, UL-MAP, Compressed UL-MAP, User file

[Remark] If UL-MAP is selected, the data shown in the UL-MAP format in Section 3.2.1 will be set. If Compressed UL-MAP is selected, the data shown in the Compressed UL-MAP format in Section 3.2.1 will be set. Compressed UL-MAP becomes unavailable if UL-MAP is added to Burst#0 of Zone#0, and UL-MAP becomes unavailable if it is added to the MAC Message.
DL-MAP must exist in the MAC Message and DL-MAP Type must be set to Compressed DL-MAP before adding UL-MAP to MAC Message.
If any value other than UL-MAP or Compressed UL-MAP is selected, the selected data with the Header and CRC added is mapped to the UL-MAP field. For the Payload Data of the UL-MAP, the same data is mapped for each frame. The Payload Data of the UL-MAP therefore does not have continuity over frames.
When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of UL-MAP. The PN data therefore does not have continuity over frames.
Refer to Appendix B “User File Format” for details on the user file format.

UL-MAP Type Repeat Data

[Function] Sets the data when UL-MAP Type = 16 bit repeat.

[Default] 0x0000

[Setting range] 0x0000 to 0xFFFF

[Remark] This parameter is displayed only when UL-MAP Type = 16 bit repeat.

UL-MAP Type User File

[Function] Sets the user file when UL-MAP Type = User File.

[Remark] This parameter is displayed only when UL-MAP Type = User File.

UL-MAP Length

[Function] Sets the number of bytes of UL-MAP.

[Setting range] 0 to 2037 bytes

[Remark] Display only when UL-MAP Type is UL-MAP or Compressed UL-MAP. If any value other than UL-MAP or Compressed UL-MAP is selected, the length of the payload data of the UL-MAP is set.

UCD Count

[Function] Sets the UCD count.

[Default] 0

[Setting range] 0 to 255

[Remark] This parameter can be edited when UL-MAP Type is set to UL-MAP or Compressed UL-MAP.

Uplink Allocation Start Time

[Function] Sets the delay for the starting timing of the uplink subframes with respect to the frame starting timing. Displays the setting value of the parameter of the same name in the common parameter list.

[Setting range] Display only

UL-MAP IE

The items that correspond to Uplink Burst are displayed under UL-MAP IE.

CID

[Function] Sets the CID.

[Default] 0

[Setting range] 0 to 65535

UIUC

[Function] Sets the uplink interval usage code (UIUC).

[Default] 0

[Setting range] 1 to 10

[Remark] When the UIUC Setting is set to Auto in the common PHY/MAC parameter list, UIUC is set automatically and cannot be edited.

UL-Burst Duration

[Function] Displays the setting value of the parameter of the same name in UL-Burst.

[Setting range] Display only

Repetition Coding Indication

[Function] Displays the setting value of the parameter of the same name in UL-Burst.

[Setting range] Display only

3.1.4.9 SUB-DL-UL-MAP

When a SUB-DL-UL-MAP is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the SUB-DL-UL-MAP.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the SUB-DL-UL-MAP is created. In this event, however, error evaluation for SUB-DL-UL-MAP is still executed.

OFDMA Symbol Offset

[Function] Displays the OFDMA Symbol Offset of the SUB-DL-UL-MAP.

[Setting range] Display only

OFDMA Subchannel Offset

[Function] Displays the OFDMA Subchannel Offset of the SUB-DL-UL-MAP.

[Setting range] Display only

Length

[Function] Displays the length of the SUB-DL-UL-MAP.

[Setting range] Display only

FEC Code Type and Modulation Type

[Function] Sets the FEC Code Type and Modulation Type of the SUB-DL-UL-MAP.

[Default] QPSK(CTC)1/2

[Setting range] QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6 QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)

Repetition Coding Indication

[Function] Sets the Repetition Coding used for the SUB-DL-UL-MAP.

[Default] No repetition

[Setting range] No repetition, 2, 4, 6

[Remark] No repetition is set when FEC Code Type and Modulation Type is set to other than QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding).

RCID Type

[Function] Sets the RCID type.

[Default] Normal CID

[Setting range] Normal CID, RCID11, RCID7, RCID3

HARQ ACK offset indicator

[Function] Sets the HARQ ACK offset indicator.

[Default] 0

[Setting range] 0, 1

DL HARQ ACK offset

[Function] Sets the DL HARQ ACK offset.

[Default] 0

[Setting range] 0 to 255

[Remark] Enabled when HARQ ACK offset indicator is set to 1.

UL HARQ ACK offset

[Function] Sets the UL HARQ ACK offset.

[Default] 0

[Setting range] 0 to 255

[Remark] Enabled when HARQ ACK offset indicator is set to 1.

DL IE Count

[Function] Displays the number of DL-MAP IEs included in the SUB-DL-UL-MAP.

[Setting range] Display only

OFDMA Symbol Offset

[Function] Sets the OFDMA Symbol Offset that is mapped as data in the SUB-DL-UL-MAP.

[Default] 0

[Setting range] 0 to 255

OFDMA Subchannel Offset

[Function] Sets the OFDMA Subchannel Offset that is mapped as data in the SUB-DL-UL-MAP.

[Default] 0

[Setting range] 0 to 127

3.1.4.10 DCD

When a DCD is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. The set for DCD will be mapped as the UCD Count data of DCD, in the format shown in 3.2.1 "FCH, DL-MAP, UL-MAP, DCD, UCD".

Data Status

[Function] Enables and disables the DCD.

[Default] Enable
[Setting range] Enable, Disable
[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the DCD is created. In this event, however, error evaluation for DCD is still executed.

DCD Offset

[Function] Sets the frame count before the first DCD is output.
[Default] 0
[Setting range] 0 to (Number of Frames − 1)

DCD Interval

[Function] Sets the DCD transmission frame interval.
[Default] 0
[Setting range] 0 to Number of Frames

DCD Length

[Function] Sets the data length of the DCD.
[Default] 0 (for other than DCD Data Type = TLV)
Displays the calculated value (for DCD Data Type = TLV).
[Setting range] 0 to 2037 (for other than DCD Data Type = TLV)
Display only (for DCD Data Type = TLV)
[Remark] When DCD Data Type = TLV, the calculated value is displayed and cannot be edited. When DCD Data Type is other than TLV, the data length of the DCD excluding MAC Header and CRC is set.

DCD Data Type

[Function] Sets the data of the DCD.

[Default] TLV

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, User File, TLV

[Remark] When DCD Data Type is set to other than TLV, items other than Data Status, DCD Offset, DCD Interval, DCD Length and DCD Data Type are disabled and cannot be edited.
The DCD data is cut off at the data length set in DCD Length and therefore does not have continuity between frames.

Configuration Change Count

[Function] Sets the Configuration Change Count (DCD data).

[Default] 0

[Setting range] 0 to 255

TLV encoded information

Each of the TLV encoded information items below can be enabled or disabled using the check box on its left. Disabled items are not generated as DCD data.

Frequency

[Function] Sets the frequency.

[Default] 2345000 kHz

[Setting range] 0 to 6000000 kHz

Base Station ID

[Function] Sets the Base Station ID.

[Default] The setting value of the parameter of the same name in DL-MAP (if DL-MAP exists)
000000000000 (if DL-MAP does not exist)

[Setting range] 000000000000 to FFFFFFFFFFFF

[Remark] When a DL-MAP exists, the setting value of the parameter of the same name in DL-MAP is displayed and cannot be edited.

MAC version

[Function] Sets the MAC version.

[Default] 1

[Setting range] 1 to 6

BS EIRP
[Function] Sets the BS EIRP.
[Default] 0
[Setting range] −32768 to 32767

TTG
[Function] Displays the TTG.
[Setting range] Display only

RTG
[Function] Displays the RTG.
[Setting range] Display only

EIRxP_IR_MAX
[Function] Sets the EIRxP_IR_MAX.
[Default] 0
[Setting range] −32768 to 32767

HO Type Support
[Function] Sets the HO Type Support.
[Default] HO
[Setting range] HO, MDHO, FBSS HO

Paging Group ID
[Function] Sets the Paging Group ID.
[Default] 0
[Setting range] 0000 to FFFF

Trigger Type
[Function] Sets the Trigger Type.
[Default] 0
[Setting range] 0 to 3

Trigger Function
[Function] Sets the Trigger Function.
[Default] 0
[Setting range] 0 to 6

Trigger Action
[Function] Sets the Trigger Action.
[Default] 1
[Setting range] 1 to 3

Trigger Value
[Function] Sets the Trigger Value.
[Default] 0
[Setting range] 00 to FF

Trigger averaging Duration
[Function] Sets the Trigger averaging Duration.
[Default] 0
[Setting range] 0 to 255

BS Restart Count
[Function] Sets the BS Restart Count.
[Default] 0
[Setting range] 00 to FF

Default RSSI and CINR averaging parameter
[Function] Sets the Default RSSI and CINR averaging parameter.
[Default] 0
[Setting range] 00 to FF

DL AMC Allocated Physical Bands Bitmap
[Function] Displays the DL AMC Allocated Physical Bands Bitmap.
[Default] Display only
[Setting range]

Hysteresis margin
[Function] Sets the Hysteresis margin.
[Default] 0
[Setting range] 00 to FF

Time to trigger duration
[Function] Sets the Time to trigger duration.
[Default] 0
[Setting range] 00 to FF

DL-Burst Profile (DIUC = 0 to 12)

The DL-Burst Profile item below can be enabled or disabled using the check box on its left. Disabled items are not generated as DCD data.

FEC Type
[Function] Sets the DIUC of the Burst Profile.
[Setting range] Display only
[Remark] Displays the DIUC and FEC Type that are related in the DIUC List of the common PHY/MAC parameter list.

3.1.4.11 UCD

When a UCD is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. The values set in the UCD are mapped as UCD data in the format shown in Section 3.2.1.

Data Status

[Function] Enables and disables the UCD.
[Default] Enable
[Setting range] Enable, Disable
[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the UCD is created. In this event, however, error evaluation for UCD is still executed.

UCD Offset

[Function] Sets the frame count before the first UCD is output.
[Default] 0
[Setting range] 0 to (Number of Frames − 1)

UCD Interval

[Function] Sets the UCD transmission frame interval.
[Default] 0
[Setting range] 0 to Number of Frames

UCD Length

[Function] Sets data length of the UCD.
[Default] 0 (for other than UCD Data Type = TLV)
Displays the calculated value (for UCD Data Type = TLV).
[Setting range] 0 to 2037 (for other than UCD Data Type = TLV)
Display only (for UCD Data Type = TLV)
[Remark] When UCD Data Type = TLV, the calculated value is displayed and cannot be edited. When UCD Data Type is other than TLV, the data length of the UCD excluding MAC Header and CRC is set.

UCD Data Type

[Function] Sets the data of the UCD.

[Default] TLV

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, User File, TLV

[Remark] When UCD Data Type is set to other than = TLV, items other than Data Status, UCD Offset, UCD Interval, UCD Length and UCD Data Type are disabled and cannot be edited.
The UCD data is cut off at the data length set in UCD Length and therefore does not have continuity between frames.

Configuration Change Count

[Function] Sets the Configuration Change Count, which is UCD data.

[Default] 0

[Setting range] 0 to 255

Ranging Backoff Start

[Function] Sets the Ranging Backoff Start, which is UCD data.

[Default] 0

[Setting range] 0 to 255

Ranging Backoff End

[Function] Sets the Ranging Backoff End, which is UCD data.

[Default] 0

[Setting range] 0 to 255

Request Backoff Start

[Function] Sets the Request Backoff Start, which is UCD data.

[Default] 0

[Setting range] 0 to 255

Request Backoff End

[Function] Sets the Request Backoff End, which is UCD data.

[Default] 0

[Setting range] 0 to 255

TLV encoded information

Each of the TLV encoded information items below can be enabled or disabled using the check box on its left. Disabled items are not generated as UCD data.

Frequency

[Function] Sets the frequency.

[Default] 2345000 kHz

[Setting range] 0 to 6000000 kHz

Contention-based Reservation Timeout

[Function] Sets the Contention-based Reservation Timeout.

[Default] 0

[Setting range] 00 to FF

Start of Ranging Coded Group

[Function] Sets the Start of Ranging Coded Group.

[Default] 0

[Setting range] 00 to FF

Band AMC Allocation Threshold

[Function] Sets the Band AMC Allocation Threshold.

[Default] 0

[Setting range] 00 to FF

Band AMC Release Threshold

[Function] Sets the Band AMC Release Threshold.

[Default] 0

[Setting range] 00 to FF

Band AMC Allocation Timer

[Function] Sets the Band AMC Allocation Timer.

[Default] 0

[Setting range] 00 to FF

Band AMC Release Timer
[Function] Sets the Band AMC Release Timer.
[Default] 0
[Setting range] 00 to FF

Band AMC Status Reporting Max Period
[Function] Sets the Band AMC Status Reporting Max Period.
[Default] 0
[Setting range] 00 to FF

Band AMC Retry Timer
[Function] Sets the Band AMC Retry Timer.
[Default] 0
[Setting range] 00 to FF

Normalized C/N Override-2
[Function] Sets the Normalized C/N Override-2.
[Default] 0000000000000000
[Setting range] 0000000000000000 to FFFFFFFFFFFFFFFF

Use CQICH Indication Flag
[Function] Sets the Use CQICH Indication Flag.
[Default] 0
[Setting range] 00 to FF

Handover Ranging Code
[Function] Sets the Handover Ranging Codes.
[Default] 0
[Setting range] 00 to FF

Initial Ranging Codes
[Function] Sets the Initial Ranging Codes.
[Default] 0
[Setting range] 00 to FF

Initial Ranging Interval
[Function] Sets the Initial Ranging Interval.
[Default] 0
[Setting range] 00 to FF

Tx Power Report

[Function] Sets the Tx Power Report.

[Default] 0

[Setting range] 0000 to FFFF

Normalized C/N for channel Sounding

[Function] Sets the Normalized C/N for channel Sounding.

[Default] 0

[Setting range] 00 to FF

Initial Ranging backoff start

[Function] Sets the Initial Ranging backoff start.

[Initial Value] 0

[Setting range] 00 to FF

Initial Ranging backoff end

[Function] Sets the Initial Ranging backoff end.

[Default] 0

[Setting range] 00 to FF

Bandwidth request backoff start

[Function] Sets the Bandwidth request backoff start.

[Default] 0

[Setting range] 00 to FF

Bandwidth request backoff end

[Function] Sets the Bandwidth request backoff end.

[Default] 0

[Setting range] 00 to FF

Permutation Base

[Function] Sets the Permutation Base.

[Default] 0

[Setting range] 00 to FF

UL Allocated Subchannels Bitmap

[Function] Sets the UL Allocated Subchannels Bitmap.

[Setting range] Display only

[Remark] Displays the UL Allocated Subchannels Bitmap settings in the common parameter list.

HARQ Ack Delay for DL burst

[Function] Sets the HARQ Ack Delay for DL burst.

[Default] 0

[Setting range] 00 to FF

UL AMC Allocated Physical Bands Bitmap

[Function] Sets the UL AMC Allocated Physical Bands Bitmap.

[Default] 000000000000

[Setting range] 000000000000 to FFFFFFFFFFFF

Size of CQICH-ID field

[Function] Sets the Size of CQICH-ID field.

[Default] 0

[Setting range] 00 to FF

Band-AMC entry average CINR

[Function] Sets the Band-AMC entry average.

[Default] 0

[Setting range] 00 to FF

HO ranging start

[Function] Sets the HO ranging start.

[Default] 0

[Setting range] 00 to FF

HO ranging end

[Function] Sets the HO ranging end.

[Default] 0

[Setting range] 00 to FF

Periodic Ranging Codes

[Function] Sets the Periodic Ranging Codes.

[Default] 0

[Setting range] 00 to FF

Bandwidth Request Codes

[Function] Sets the Bandwidth Request Codes.

[Default] 0

[Setting range] 00 to FF

Periodic Ranging Backoff Start

[Function] Sets the Periodic Ranging Backoff Start.

[Default] 0

[Setting range] 00 to FF

Periodic Ranging Backoff End

[Function] Sets the Periodic Ranging Backoff End.

[Default] 0

[Setting range] 00 to FF

CQICH Band AMC Transition Delay

[Function] Sets the CQICH Band AMC Transition Delay.

[Default] 0

[Setting range] 00 to FF

UL-Burst Profile (UIUC = 1 to 10)

Each of the UL-Burst Profile items below can be enabled or disabled using the check box on its left. Disabled items are not generated as UCD data.

FEC Type

[Function] Sets the UIUC of the Burst Profile.

[Setting range] Display only

[Remark] Displays the UIUC and FEC Type that are related in the UIUC List of the common PHY/MAC parameter list.

Ranging Data ratio

[Function] Sets the Ranging Data Ratio.

[Default] 0

[Setting range] 00 to FF

3.1.4.12 DL-Zone

When a Zone that belongs to the Downlink is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the DL-Zone.
[Default] Enable
[Setting range] Enable, Disable
[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected DL-Zone is created. In this event, however, error evaluation for the selected DL-Zone is still executed.

Permutation

[Function] Sets the Permutation type.
[Default] PUSC
[Setting range] PUSC, PUSC (all SC), FUSC, AMC (6x1), AMC (3x2), AMC (2x3), AMC (1x6)
[Remark] Only PUSC can be selected for Zone#0.

Pilot Position

[Function] Sets the position of the pilot subcarrier.
[Default] Hopping
[Setting range] Hopping, Center
[Remark] Enabled in zones in which Permutation is set to AMC (1x6), AMC (2x3), AMC (3x2) or AMC (6x1).
When set to Center, the position of the pilot subcarrier is fixed to the center of bin.

Dedicated Pilot

[Function] Sets the Dedicated Pilot.
[Default] 0
[Setting range] 0, 1
[Remark] Enabled in zones in which Permutation is set to PUSC, PUSC (all SC), AMC (1x6), AMC (2x3), AMC (3x2) or AMC (6x1).
Only 0 can be selected for Zone#0.

Pilot Boosting

[Function] Sets the Pilot Boosting.

[Default] OFF

[Setting range] OFF, ON

[Remark] Enabled when STC/MIMO is set to 2 antenna matrixA (STTD) or 2 antenna matrixB vertical encoding.
When set to OFF, the pilot subcarrier power is the same and the data subcarrier power is lower by 3 dB as compared to when STC/MIMO is set to No transmit diversity.
When set to ON, the pilot subcarrier power is higher by 3 dB and the data subcarrier power is the same.

STC/MIMO

[Function] Sets the Zone transmission method. A pilot pattern will be set for the selected Zone based on this parameter.

[Default] No transmit diversity

[Setting range] No transmit diversity, 2 Antenna MatrixA (STTD), 2 Antenna MatrixB vertical encoding

[Remark] This parameter can be set for DL-Zones other than DL-Zone#0, only when Number of Tx Antennas is set to 2 and Permutation is set to PUSC, PUSC (all SC). Refer to Section 3.2.4 “STC/MIMO” for details.

OFDMA Symbol Offset

[Function] Sets the Zone switching position.

[Default] Zone#0:
1 symbol when Preamble exists
0 symbols when no Preamble exists
Zones#1 to #7:
The last symbol of the previous Zone

[Setting range] Zone#0: Display only
Zones#1 to #7:
0 to 255 symbols (when no Preamble exists)
1 to 255 symbols (when any Preamble exists)

No. OFDMA Symbols

[Function] Sets the number of symbols of the Zone.

[Default] 2 symbols

[Setting range] 2 to 254 symbols (for PUSC)
2 to 254 symbols (for PUSC (all SC))
1 to 255 symbols (for FUSC)
1 to 255 symbols (for AMC (6x1))
2 to 254 symbols (for AMC (3x2))
3 to 255 symbols (for AMC (2x3))
6 to 252 symbols (for AMC (1x6))

[Remark] It can be changed in 1-symbol steps for FUSC and AMC (6x1), in 2-symbol steps for PUSC, PUSC (all SC), AMC (3x2), in 3-symbol steps for AMC (3x2), and in 6-symbol steps for AMC (1x6).

DL-PermBase

[Function] Sets the DL-PermBase.

[Default] 0

[Setting range] 0 to 31

[Remark] It cannot be edited for Zone#0.

DL-Burst Number

[Function] Sets the number of DL-Bursts included in the DL-Zone.

[Default] 1

[Setting range] 1 to 16

PRBS_ID

[Function] Sets the PRBS_ID.

[Default] 0

[Setting range] 0 to 3

[Remark] This setting item is not displayed for Zone#0.

3.1.4.13 DL-Burst

When a Burst that belongs to the Downlink is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the DL-Burst.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected DL-Burst is created. In this event, however, error evaluation for the selected DL-Burst is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the Burst.

[Default] OFDMA Symbol Offset of the zone to which the selected DL-Burst belongs

[Setting range] The setting range changes depending on the permutation type of the zone to which the selected DL-Burst belongs, OFDMA Symbol Offset set for the zone, and whether Preamble exists in the zone.

- For Zone#0 without Preamble:
  0 to 254 symbols (Can be set with an even symbol.)
- For Zone#0 with Preamble:
  1 to 255 symbols (Can be set with an odd symbol.)
- For Zones#1 to #7 with Permutation set to PUSC:
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps
- For zones with Permutation set to PUSC (all SC):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps
- For zones with Permutation set to FUSC:
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 1-symbol steps
- For zones with Permutation set to AMC (6x1):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 1-symbol steps
- For zones with Permutation set to AMC (3x2):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps

- For zones with Permutation set to AMC (2x3): [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps
- For zones with Permutation set to AMC (1x6): [OFDMA Symbol Offset of the zone] to 255 symbols, in 6-symbol steps

[Remark] Set the offset counted from the starting symbol of the frame.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the Burst.

[Default] 0 (when the Burst is added on the main screen)
Mouse pointer position (when the Burst is added on the Segment Edit screen)

[Setting range] 0 to 63 (for other than AMC (2x3) and AMC (1x6))
0 to 255 (for AMC (2x3) and AMC (1x6))

[Remark] Refer to Section 3.2.3 “Settable number of subchannels” for the number of subchannels in a zone.

Boosting

[Function] Sets the power boosting for the Burst.

[Default] 0 dB

[Setting range] 0, +/–3, +/–6, +/–9, –12 dB

No. OFDMA Symbols

[Function] Sets the number of OFDMA symbols used.

[Default] 2 (for PUSC and PUSC (all SC))
2 (for FUSC, AMC (3x2), and AMC (6x1))
3 (for AMC (2x3))
6 (for AMC (1x6))

[Setting range] 2 to 126 symbols (for PUSC)
2 to 126 symbols (for PUSC (all SC))
1 to 127 symbols (for FUSC)
1 to 127 symbols (for AMC (6x1))
2 to 126 symbols (for AMC (3x2))
3 to 93 symbols (for AMC (2x3))
6 to 90 symbols (for AMC (1x6))

No. Subchannels

[Function] Sets the number of subchannels used.

[Default] 7

[Setting range] 1 to 63

Repetition Coding Indication

[Function] Sets the repetition Coding used for the Burst.

[Default] No repetition

[Setting range] No repetition, 2, 4, 6

[Remark] No repetition is set when FEC Code Type and Modulation Type is set to other than QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding).

FEC Code Type and Modulation Type

[Function] Sets the FEC Code Type and Modulation Type of the Burst.

[Default] QPSK(CTC)1/2

[Setting range] QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6 QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)

Inclusion MAP

[Function] Sets the MAP for mapping the DL-MAP IE corresponding to the Burst.

[Default] Normal

[Setting range] Normal, SUB-DL-UL-MAP#n (n = 0 to 2)

[Remark] The range of SUB-DL-UL-MAP#n (n = 0 to 2) depends on the number of SUB-DL-UL-MAPs added in the tree view.

DL-Burst Data Type

[Function] Sets the data of the DL-Burst.

[Default] 16 bit repeat

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, MAC PDU, User File

[Remark] The data set in this list item is channel-coded as the Burst data, and then mapped to the field assigned to the Burst. When MAC PDU is selected, "1" is inserted if the total data size of the MAC PDU is smaller than the field assigned to the Burst.

If this item is set to any value other than MAC PDU, the data of each Burst remains continuous over the number of frames set in the common parameter Number of Frames. For example, if Number of Frames is set to a value greater than or equal to 2 and PN9fix is set in the data of Burst#1 in Zone#1, the data after the Burst#1, Zone#1 of the first frame is mapped to the data of Burst#1, Zone#1 of the next frame. Also, if this item is set to other than MAC PDU while MAC PDU is added under Burst, the set data is mapped as the Burst data.

When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of the waveform pattern to be generated. The PN data therefore does not have continuity between the end of a waveform pattern and the start of the next waveform pattern. Note also that the PN data changes depending on Burst when PN9fix or PN15fix is selected.

Refer to Appendix B "User File Format" for details on the user file format.

DL-Burst Data Type Repeat Data

[Function] Sets the data when DL-Burst Data Type = 16 bit repeat.

[Default] 0xFFFF

[Setting range] 0x0000 to 0xFFFF

[Remark] This parameter is displayed only when DL-Burst Data Type = 16 bit repeat.

DL-Burst Data Type User File

[Function] Specifies the user file when DL-Burst Data Type = User File.

[Remark] This parameter is displayed only when DL-Burst Data Type = User File.

MAC PDU Number

[Function] Sets the number of MAC PDUs belonging to the DL-Burst.

[Default] 0

[Setting range] 0 to 32

[Remark] This parameter is displayed only when DL-Burst Data Type = MAC PDU.

Matrix Indicator

[Function] Sets the Matrix to be used in the Burst.

[Default] The same setting as STC/MIMO of the DL-Zone.

[Setting range] matrix A, matrix B

[Remark] Enabled when STC/MIMO of the Zone added to the DL-Burst is set to 2 antenna matrixA (STTD) or 2 antenna matrixB vertical encoding.
When the Matrix setting set in DL-Burst is different from that of Zone, MIMO DL basic IE is mapped to DL-MAP.
Refer to Section 3.2.1 “FCH, DL-MAP, UL-MAP, DCD, UCD” for details on MIMO DL basic IE.

3.1.4.14 MAP-Burst

When a MAP-Burst that belongs to the Downlink is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the MAP-Burst.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected MAP-Burst is created. In this event, however, error evaluation for the selected MAP-Burst is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the MAP-Burst.

[Default] OFDMA Symbol Offset of the zone to which the selected MAP-Burst belongs

[Setting range] The setting range changes depending on the permutation type of the zone to which the selected DL-Burst belongs, OFDMA Symbol Offset set for the zone, and whether Preamble exists in the zone.

- For Zone#0 without Preamble:
  0 to 254 symbols (Can be set with an even symbol.)
- For Zone#0 with Preamble:
  1 to 255 symbols (Can be set with an odd symbol.)
- For Zones#1 to #7 with Permutation set to PUSC:
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps
- For zones with Permutation set to PUSC (all SC):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps
- For zones with Permutation set to FUSC:
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 1-symbol steps
- For zones with Permutation set to AMC (6x1):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 1-symbol steps
- For zones with Permutation set to AMC (3x2):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps

- For zones with Permutation set to AMC (2x3): [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps
- For zones with Permutation set to AMC (1x6): [OFDMA Symbol Offset of the zone] to 255 symbols, in 6-symbol steps

[Remark] Set the offset counted from the starting symbol of the frame.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the MAP-Burst.

[Default] 0 (when the MAP-Burst is added on the main screen)
Mouse pointer position (when the MAP-Burst is added on the Segment Edit screen)

[Setting range] 0 to (Number of subchannels in the zone)

[Remark] Refer to Section 3.2.3 “Settable number of subchannels” for the number of subchannels in a zone.

Length

[Function] Sets the number of slots in the MAP-Burst.

[Default] 1 to 255 slots

Repetition Coding Indication

[Function] Sets the repetition Coding used for the MAP-Burst.

[Default] No repetition

[Setting range] No repetition, 2, 4, 6

[Remark] No repetition is set when FEC Code Type and Modulation Type is set to other than QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding).

FEC Code Type and Modulation Type

[Function] Sets the FEC Code Type and Modulation Type of the MAP-Burst.

[Default] QPSK(CTC)1/2

[Setting range] QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6 QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)

MAP-Burst Data Type

[Function] Sets the data of the MAP-Burst.

[Default] PN9fix

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, MAC PDU, User File

[Remark] The data set in this list item is channel-coded as the MAP-Burst data, and then mapped to the field assigned to the MAP-Burst. When MAC PDU is selected, "1" is inserted if the total data size of the MAC PDU is smaller than the field assigned to the MAP-Burst.
If this item is set to any value other than MAC PDU, the data of each MAP-Burst remains continuous over the number of frames set in the common parameter Number of Frames. For example, if Number of Frames is set to a value greater than or equal to 2 and PN9fix is set in the data of MAP-Burst#1 in Zone#1, the data after the MAP-Burst#1, Zone#1 of the first frame is mapped to the data of MAP-Burst#1, Zone#1 of the next frame. Also, if this item is set to other than MAC PDU while MAC PDU is added under MAP-Burst, the set data is mapped as the MAP-Burst data.
When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of the waveform pattern to be generated. The PN data therefore does not have continuity between the end of a waveform pattern and the start of the next waveform pattern. Note also that the PN data changes depending on MAP-Burst when PN9fix or PN15fix is selected.
Refer to Appendix B "User File Format" for details on the user file format.

MAP-Burst Data Type Repeat Data

[Function] Sets the data when MAP-Burst Data Type = 16 bit repeat.

[Default] 0xFFFF

[Setting range] 0x0000 to 0xFFFF

[Remark] This parameter is displayed only when MAP-Burst Data Type = 16 bit repeat.

MAP-Burst Data Type User File

[Function] Specifies the user file when MAP-Burst Data Type = User File.

[Remark] This parameter is displayed only when MAP-Burst Data Type = User File.

MAC PDU Number

[Function] Sets the number of MAC PDUs belonging to the MAP-Burst.

[Default] 0

[Setting range] 0 to 32

[Remark] This parameter is displayed only when MAP-Burst Data Type = MAC PDU.

3.1.4.15 DL-HARQ Burst

When a DL-HARQ Burst is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the DL-HARQ Burst.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the DL-HARQ Burst is created. In this event, however, error evaluation for the selected DL-HARQ Burst is still executed.

RCID_Type

[Function] Sets the RCID_Type.

[Default] Normal CID

[Setting range] Normal CID, RCID11, RCID7, RCID3

[Remark]

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the DL-HARQ Burst.

[Default] OFDMA Symbol Offset of the zone to which the selected DL-HARQ Burst belongs

[Setting range] The setting range changes depending on the permutation type of the zone to which the selected DL-HARQ Burst belongs, OFDMA Symbol Offset set for the zone, and whether Preamble exists in the zone.

- For Zone#0 without Preamble:
  0 to 254 symbols (Can be set with an even symbol.)
- For Zone#0 with Preamble:
  1 to 255 symbols (Can be set with an odd symbol.)
- For Zones#1 to #7 with Permutation set to PUSC:
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps
- For zones with Permutation set to PUSC (all SC):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps
- For zones with Permutation set to FUSC:
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 1-symbol steps

- For zones with Permutation set to AMC (6x1): [OFDMA Symbol Offset of the zone] to 255 symbols, in 1-symbol steps
- For zones with Permutation set to AMC (3x2): [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps
- For zones with Permutation set to AMC (2x3): [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps
- For zones with Permutation set to AMC (1x6): [OFDMA Symbol Offset of the zone] to 255 symbols, in 6-symbol steps

[Remark] Set the offset counted from the starting symbol of the frame.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the DL-HARQ Burst.

[Default] 0 (when the DL-HARQ Burst is added on the main screen)
Mouse pointer position (when the DL-HARQ Burst is added on the Segment Edit screen)

[Setting range] 0 to (Number of subchannels in the zone)

[Remark] Refer to Section 3.2.3 “Settable number of subchannels” for the number of subchannels in a zone.

Boosting

[Function] Sets the power boosting for the DL-HARQ Burst.

[Default] 0 dB

[Setting range] 0, +/–3, +/–6, +/–9, –12 dB

Rectangular Sub-Burst Indicator

[Function] Sets the Sub-Burst mapping method.

[Default] 0

[Setting range] 0, 1

[Remark] Enabled in zones in which Permutation is set to AMC(1x6), AMC(2x3), AMC(3x2) or AMC(6x1).

No. OFDMA Symbols

[Function] Sets the number of OFDMA symbols used.

[Default] 2 (for PUSC and PUSC (all SC))
2 (for FUSC, AMC(3x2), and AMC (6x1))
3 (for AMC(2x3))
6 (for AMC(1x6))

[Setting range] 2 to 126 symbols (for PUSC)
2 to 126 symbols (for PUSC (all SC))
1 to 127 symbols (for FUSC)
1 to 127 symbols (for AMC (6x1))
2 to 126 symbols (for AMC (3x2))
3 to 126 symbols (for AMC (2x3))
6 to 126 symbols (for AMC(1x6))

No. Subchannels

[Function] Sets the number of subchannels used.

[Default] 1

[Setting range] 1 to 127

[Remark] The lower limit depends on the number of Sub-Bursts added.

Mode

[Function] Displays the HARQ mode.

[Setting range] Chase HARQ, MIMO Chase HARQ

[Remark] MIMO Chase HARQ can only be selected in the zones in which STC/MIMO is set to 2 antenna matrix A(STTD) or 2 antenna matrix B vertical encoding.

N sub Burst

[Function] Sets the number of Sub-Bursts added to the DL-HARQ Burst.

[Default] 1

[Setting range] 1 to 16

N ACK Channel

[Function] Sets the N ACK Channel.

[Default] 0

[Setting range] 0 to 15

[Remark]

Inclusion MAP

[Function] Sets the MAP for mapping the DL-MAP IE corresponding to the DL-HARQ Burst.

[Default] Normal

[Setting range] Normal, SUB-DL-UL-MAP#n (n = 0 to 2)

[Remark] The range of SUB-DL-UL-MAP#n (n = 0 to 2) depends on the number of SUB-DL-UL-MAPs added in the tree view.

3.1.4.16 Sub-Burst

When a Sub-Burst is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the Sub-Burst.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the Sub-Burst is created. In this event, however, error evaluation for Sub-Burst is still executed.

CID

[Function] Sets the CID.

[Default] 0

[Setting range] 0 to 65535

[Remark] The range for the CID of the DL HARQ Chase sub-burst IE corresponding to the Sub-Burst changes as follows, depending on the RCID_Type setting of the DL HARQ Burst to which the Sub-Burst belongs.

- When RCID_Type = Normal CID
  All bits of CID (16 bits)
- When RCID_Type = RCID11
  Lower 11 bits of CID
- When RCID_Type = RCID7
  Lower 7 bits of CID
- When RCID_Type = RCID3
  Lower 3 bits of CID

Sub-Burst Duration

[Function] Sets the Sub-Burst Duration

[Default] 1 (slot)

[Setting range] 1 to 1023 (slots)

[Remark] Sub-Burst Duration depends on the size of the DL-HARQ Burst.

Sub-Burst DIUC Indication

[Function] Sets the Sub-Burst DIUC Indication.

[Default] 1 (Sub-Burst#0)
0 (for other than Sub-Burst#0)

[Setting range] 0, 1

[Remark] For Sub-Burst#0, the Sub-Burst DIUC Indication is fixed to 1 and cannot be edited. When Sub-Burst-added DL-HARQ Burst Mode is set to MIMO Chase HARQ, it is fixed to 1 and cannot be edited.

Repetition Coding Indication

[Function] Sets the Repetition Coding Indication.

[Default] No repetition

[Setting range] No repetition, 2, 4, 6

[Remark] Enabled when Sub-Burst DIUC Indication = 1. When Sub-Burst DIUC Indication = 0, the setting is the same as the previous Sub-Burst and cannot be edited.
No repetition is set when FEC Code Type and Modulation Type is set to other than QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4 or QPSK(No Ch Coding).

FEC Code Type and Modulation Type

[Function] Sets the FEC Code Type and Modulation Type of the Sub-Burst.

[Default] QPSK(CTC)1/2

[Setting range] QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6, QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)

[Remark] Enabled when Sub-Burst DIUC Indication = 1. When Sub-Burst DIUC Indication = 0, the setting is the same as the previous Sub-Burst and cannot be edited.

Sub-Burst Data Type

[Function] Sets the data of the Sub-Burst.

[Default] PN9fix

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, MAC PDU, User File

[Remark] The data set in this list item is channel-coded as the Sub-Burst data, and then mapped to the field assigned to the Sub-Burst. When MAC PDU is selected, "1" is inserted if the total data size of the MAC PDU is smaller than the field assigned to the Sub-Burst.
If this item is set to any value other than MAC PDU, the data of each Sub-Burst remains continuous over the number of frames set in the common parameter Number of Frames. For example, if Number of Frames is set to a value greater than or equal to 2 and PN9fix is set in the data of Sub-Burst#1 in DL HARQ Burst#0 of Zone#1, the data after the Sub-Burst#1, DL HARQ Burst#0, Zone#1 of the first frame is mapped to the data of Sub-Burst#1, DL HARQ Burst#0, Zone#1 of the next frame. Also, if this item is set to other than MAC PDU while MAC PDU is added under the Sub-Burst, the set data is mapped as the Sub-Burst data.
When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of the waveform pattern to be generated. The PN data therefore does not have continuity between the end of a waveform pattern and the start of the next waveform pattern. Note also that the PN data changes depending on Sub-Burst when PN9fix or PN15fix is selected.
Refer to Appendix B "User File Format" for details on the user file format.

Sub-Burst Data Type Repeat Data

[Function] Sets the data when Sub-Burst Data Type = 16 bit repeat.

[Default] 0xFFFF

[Setting range] 0x0000 to 0xFFFF

[Remark] This parameter is displayed only when Sub-Burst Data Type = 16 bit repeat.

Sub-Burst Data Type User File

[Function] Specifies the user file when Sub-Burst Data Type = User File.

[Remark] This parameter is displayed only when Sub-Burst Data Type = User File.

MAC PDU Number

[Function] Sets the number of MAC PDUs belonging to the Sub-Burst.

[Default] 0

[Setting range] 0 to 32

[Remark] This parameter is displayed only when Sub-Burst Data Type = MAC PDU.

MU Indicator

[Function] Sets the MU Indicator.

[Default] 0

[Setting range] 0, 1

[Remark] Enabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ.

Dedicated MIMO DL Control Indicator

[Function] Sets the Dedicated MIMO DL Control Indicator.

[Default] 0

[Setting range] 0, 1

[Remark] Enabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ.

Matrix Indicator

[Function] Sets the Matrix Indicator.

[Default] matrix A

[Setting range] matrix A, matrix B

[Remark] Enabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ and the Dedicated MIMO DL Control Indicator is set to 1.

CRC Error Insertion

[Function] Sets the CRC error added to the end of the Sub-Burst.

[Default] Correct

[Setting range] Correct, Error

[Remark] When Correct is selected, no error is set for the CRC that is added to the Sub-Burst. When Error is selected, CRC error is set by inverting the lower 8 bits of the CRC that is to be added to the Sub-Burst.

ACID

[Function] Sets the ACID.

[Default] 0

[Setting range] 0 to 15

AI_SN

[Function] Sets the AI_SN.

[Default] 0

[Setting range] 0, 1

ACK disable

[Function] Sets the ACK disable.

[Default] 0

[Setting range] 0, 1

Dedicated DL Control Indicator

[Function] Sets the Dedicated DL Control Indicator.

[Default] 00

[Setting range] 00, 01, 10, 11

[Remark] Disabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ.

Duration(d)

[Function] Sets the Duration(d).

[Default] 0

[Setting range] 0 to 15

[Remark] Enabled when Dedicated DL Control Indicator = 01 or 11. Disabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ.

Allocation Index

[Function] Sets the Allocation Index.

[Default] 0

[Setting range] 0 to 63

[Remark] Enabled when Dedicated DL Control Indicator = 01 or 11 and Duration(d) is set to other than 0.
Disabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ.

Period(p)

[Function] Sets the Period(p).

[Default] 0

[Setting range] 0 to 7

[Remark] Enabled when Dedicated DL Control Indicator = 01 or 11 and Duration(d) is set to other than 0.
Disabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ.

Frame Offset

[Function] Sets the Frame offset.

[Default] 0

[Setting range] 0 to 7

[Remark] Enabled when Dedicated DL Control Indicator = 01 or 11 and Duration(d) is set to other than 0.
Disabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ.

Dedicated DL Control IE

[Function] Sets the Dedicated DL Control IE.

[Default] 0

[Setting range] 0, 1

[Remark] Enabled when Dedicated DL Control Indicator = 10 or 11.
Disabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ.

No. SDMA layers

[Function] Sets the No. SDMA layers.

[Default] 1

[Setting range] 1 to 4

[Remark] Enabled when Dedicated DL Control Indicator = 10 or 11 and Dedicated DL Control IE = 1. Disabled when the Mode of DL-HARQ Burst, to which the Sub-Burst is added, is set to MIMO Chase HARQ.

3.1.4.17 Uplink

When an Uplink is selected in the tree view, the following item is displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the Uplink.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the Uplink is created. In this event, however, error evaluation for uplink is still executed.

3.1.4.18 UL-Zone

When a Zone that belongs to the Uplink is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the UL-Zone.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected UL-Zone is created. In this event, however, error evaluation for the selected UL-Zone is still executed.

Permutation

[Function] Sets the permutation Zone type.

[Default] PUSC

[Setting range] PUSC, PUSC (w/o SC rotation), AMC (6x1), AMC (3x2), AMC (2x3), AMC (1x6)

Pilot Position
[Function] Sets the position of the pilot subcarrier.
[Default] Hopping
[Setting range] Hopping, Center
[Remark] Enabled in zones in which Permutation is set to AMC (1x6), AMC (2x3), AMC (3x2) or AMC (6x1).
When set to Center, the position of the pilot subcarrier is fixed to the center of bin.

STC/MIMO
[Function] Displays the set Zone transmission method.
[Setting range] Display only

OFDMA Symbol Offset
[Function] Sets the Zone switching position.
[Default] The last symbol of the previous Zone. Zone#0 is 0.
[Setting range] 0 to 255 symbols

No. OFDMA Symbols
[Function] Sets the number of symbols of the Zone.
[Default] 3 symbols
[Setting range] 3 to 255 symbols (for PUSC)
3 to 255 symbols (for PUSC (w/o SC rotation))
1 to 255 symbols (for AMC (6x1))
2 to 254 symbols (for AMC (3x2))
3 to 255 symbols (for AMC (2x3))
6 to 252 symbols (for AMC (1x6))
[Remark] It can be changed in 1-symbol steps for AMC (6x1), in 2-symbol steps for AMC (3x2), in 3-symbol steps for PUSC, PUSC (w/o SC rotation), and AMC (2x3), and in 6-symbol steps for AMC (1x6).

UL-PermBase
[Function] Sets the UL-PermBase.
[Default] 0
[Setting range] 0 to 69

UL-Burst Number
[Function] Sets the number of Bursts included in the UL-Zone.
[Default] 1
[Setting range] 1 to 16

3.1.4.19 UL-Burst

When a Burst that belongs to Uplink is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the UL-Burst.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected UL-Burst is created. In this event, however, error evaluation for the selected UL-Burst is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the Burst.

[Default] OFDMA Symbol Offset of the zone to which the selected UL-Burst belongs

[Setting range] The setting range changes depending on the permutation type of the zone to which the selected UL-Burst belongs, and OFDMA Symbol Offset and No. OFDMA Symbols set for the zone.

- For zones with Permutation set to PUSC:
  [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset + No. OFDMA Symbols of the zone] symbols, in 3-symbol steps
- For zones with Permutation set to PUSC (w/o SC rotation):
  [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset + No. OFDMA Symbols of the zone] symbols, in 3-symbol steps
- For zones with Permutation set to AMC (6x1):
  [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset + No. OFDMA Symbols of the zone] symbols, in 1-symbol steps
- For zones with Permutation set to AMC (3x2):
  [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset + No. OFDMA Symbols of the zone] symbols, in 2-symbol steps
- For zones with Permutation set to AMC (2x3):
  [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset + No. OFDMA Symbols of the zone] symbols, in 3-symbol steps

- For zones with Permutation set to AMC (1x6):
  [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset + No. OFDMA Symbols of the zone] symbols, in 6-symbol steps

[Remark] Set the offset counted from the starting symbol of the UL subframe.
When OFDMA Symbol Offset is set to [OFDMA Symbol Offset + No. OFDMA Symbols of the zone], OFDMA Subchannel Offset is incremented by 1 and OFDMA Symbol Offset is set to 0.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the Burst.

[Default] 0 (when the Burst is added on the main screen)
Mouse pointer position (when the Burst is added on the Segment Edit screen)

[Setting range] 0 to [Number of subchannels set for the zone – 1]

[Remark] Refer to Section 3.2.3 “Settable number of subchannels” for the number of subchannels in a zone.

UL Burst Duration

[Function] Sets the data length of the Burst.

[Default] 3 symbols (for PUSC)
3 symbols (for PUSC (w/o SC rotation))
1 symbol (for AMC (6x1))
2 symbols (for AMC (3x2)
3 symbols (for AMC (2x3))
6 symbols (for AMC (1x6))

[Setting range] 3 to 3069 symbols (for PUSC)
3 to 3069 symbols (for PUSC (w/o SC rotation))
1 to 1023 symbols (for AMC (6x1))
2 to 2046 symbols (for AMC (3x2)
3 to 3069 symbols (for AMC (2x3))
6 to 6138 symbols (for AMC (1x6))

[Remark] Under this item, UL Burst Duration value is displayed. The value is converted in units of slot.

Burst Power Offset

[Function] Sets the power offset for the UL-Burst.

[Default] 0.00 dB

[Setting range] –10.00 to 10.00 dB

Pilot Pattern

[Function] Sets the Pilot Pattern of the Burst.

[Default] Normal

[Setting range] Normal, PatternA, PatternB

[Remark] Enabled only for zones in which Permutation is set to PUSC and PUSC (w/o SC rotation). This item is set to Normal and cannot be edited for zones in which Permutation is set to other than PUSC and PUSC (w/o SC rotation).
Refer to Section 3.2.7 “Collaborative MIMO” for details.

Repetition Coding Indication

[Function] Sets the Repetition Coding used for the Burst.

[Default] No repetition

[Setting range] No repetition, 2, 4, 6

[Remark] No repetition is set when FEC Code Type and Modulation Type is set to other than QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding).

FEC Code Type and Modulation Type

[Function] Sets the FEC Code Type and Modulation Type of the Burst.

[Default] QPSK(CTC)1/2

[Setting range] QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6, QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)

Inclusion MAP

[Function] Sets the MAP for mapping the UL-MAP IE corresponding to the UL-Burst.

[Default] Normal

[Setting range] Normal, SUB-DL-UL-MAP#n (n = 0 to 2)

[Remark] The range of SUB-DL-UL-MAP#n (n = 0 to 2) depends on the number of SUB-DL-UL-MAPs added in the tree view.

UL- Burst Data Type

[Function] Sets the data of the UL-Burst.

[Default] PN9fix

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, MAC PDU, User File

[Remark] The data set in this list item is channel-coded as the Burst data, and then mapped to the field assigned to the

Burst. When MAC PDU is selected, "1" is inserted if the total data size of the MAC PDU is smaller than the field assigned to the Burst.
If this item is set to any value other than MAC PDU, the data of each Burst remains continuous over the number of frames set in the common parameter Number of Frames. For example, if Number of Frames is set to a value greater than or equal to 2 and PN9fix is set in the data of Burst#1 in Zone#1, the data after the Burst#1, Zone#1 of the first frame is mapped to the data of Burst#1, Zone#1 of the next frame. Also, if this item is set to other than MAC PDU while MAC PDU is added under Burst, the set data is mapped as the Burst data.
When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of the waveform pattern to be generated. The PN data therefore does not have continuity between the end of a waveform pattern and the start of the next waveform pattern. Note also that the PN data changes depending on Burst when PN9fix or PN15fix is selected.
Refer to Appendix B "User File Format" for details on the user file format.

UL-Burst Data Type Repeat Data

[Function] Sets the data when UL-Burst Data Type = 16 bit repeat.
[Default] 0x0000
[Setting range] 0x0000 to 0xFFFF
[Remark] This parameter is displayed only when UL-Burst Data Type = 16 bit repeat.

UL- Burst Data Type User File

[Function] Specifies the user file when UL-Burst Data Type = User File.
[Remark] This parameter is displayed only when UL-Burst Data Type = User File.

MAC PDU Number

[Function] Sets the number of MAC PDUs belonging to the UL-Burst.
[Default] 0
[Setting range] 0 to 32
[Remark] This parameter is displayed only when UL-Burst Data Type = MAC PDU.

3.1.4.20 UL-HARQ Burst

When a UL-HARQ Burst is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the UL-HARQ Burst.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the UL-HARQ Burst is created. In this event, however, error evaluation for the selected UL-HARQ Burst is still executed.

RCID_Type

[Function] Sets the RCID_Type.

[Default] Normal CID

[Setting range] Normal CID, RCID11, RCID7, RCID3

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the UL-HARQ Burst.

[Default] OFDMA Symbol Offset of the zone to which the selected UL-HARQ Burst belongs

[Setting range] The setting range changes depending on the permutation type of the zone to which the UL-HARQ Burst belongs, and OFDMA Symbol Offset and No. OFDMA Symbols set for the zone.

- For zones with Permutation set to PUSC:
  [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset of the zone + No. OFDMA Symbols set for the zone] symbols, in 3-symbol steps
- For zones with Permutation set to PUSC (w/o SC rotation):
  [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset of the zone + No. OFDMA Symbols set for the zone] symbols, in 3-symbol steps
- For zones with Permutation set to AMC (6x1):
  [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset of the zone + No. OFDMA Symbols set for the zone] symbols, in 1-symbol steps

- For zones with Permutation set to AMC (3x2): [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset of the zone + No. OFDMA Symbols set for the zone] symbols, in 2-symbol steps
- For zones with Permutation set to AMC (2x3): [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset of the zone + No. OFDMA Symbols set for the zone] symbols, in 3-symbol steps
- For Zones with Permutation set to AMC (1x6): [OFDMA Symbol Offset of the zone] to [OFDMA Symbol Offset of the zone + No. OFDMA Symbols set for the zone] symbols, in 6-symbol steps

[Remark] Set the offset counted from the starting symbol of the UL subframe.
When OFDMA Symbol Offset is set to [OFDMA Symbol Offset + No. OFDMA Symbols of the zone], OFDMA Subchannel Offset is incremented by 1 and OFDMA Symbol Offset is set to 0.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the UL-HARQ Burst.

[Default] 0 (when the UL-HARQ Burst is added on the main screen)
Mouse pointer position (when the UL-HARQ Burst is added on the Segment Edit screen)

[Setting range] 0 to (Number of subchannels in the zone)

[Remark] Refer to Section 3.2.3 “Settable number of subchannels” for the number of subchannels in a zone.

Mode

[Function] Displays the HARQ mode.

[Setting range] Chase HARQ (display only)

Allocation Start Indication

[Function] Sets the Allocation Start Indication.

[Setting range] 0

[Remark] 0, 1

N sub Burst

[Function] Sets the number of Sub-Bursts added to the UL-HARQ Burst.

[Default] 1

[Setting range] 1 to 16

Inclusion MAP

[Function] Sets the MAP for mapping the UL-MAP IE corresponding to the UL-HARQ Burst.

[Default] Normal

[Setting range] Normal, SUB-DL-UL-MAP#n (n = 0 to 2)

[Remark] The range of SUB-DL-UL-MAP#n (n = 0 to 2) depends on the number of SUB-DL-UL-MAPs added in the tree view.

3.1.4.21 Sub-Burst

When a Sub-Burst under UL-HARQ Burst is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the Sub-Burst.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the Sub-Burst is created. In this event, however, error evaluation for Sub-Burst is still executed.

CID

[Function] Sets the CID.

[Default] 0

[Setting range] 0 to 65535

[Remark] The range for the CID of the UL HARQ Chase sub-burst IE corresponding to the Sub-Burst changes as follows, depending on the RCID_Type setting of the UL HARQ Burst to which the Sub-Burst belongs.

- When RCID_Type = Normal CID:
  All bits of CID (16 bits)
- When RCID_Type = RCID11:
  Lower 11 bits of CID
- When RCID_Type = RCID7:
  Lower 7 bits of CID

- When RCID_Type = RCID3:
  Lower 3 bits of CID

FEC Code Type and Modulation Type

[Function] Sets the FEC Code Type and Modulation Type of the Sub-Burst.

[Default] QPSK(CTC)1/2

[Setting range] QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6, QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)

Repetition Coding Indication

[Function] Sets the Repetition Coding Indication.

[Default] No repetition

[Setting range] No repetition, 2, 4, 6

[Remark] No repetition is set when FEC Code Type and Modulation Type is set to other than QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4 or QPSK(No Ch Coding).

Sub-Burst Duration

[Function] Sets the Sub-Burst Duration.

[Default] 1 (slot)

[Setting range] 1 to 1023 (slots)

Sub-Burst Data Type

[Function] Sets the data of the Sub-Burst.

[Default] PN9fix

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, MAC PDU, User File

[Remark] The data set in this list item is channel-coded as the Sub-Burst data, and then mapped to the field assigned to the Sub-Burst. When MAC PDU is selected, "1" is inserted if the total data size of the MAC PDU is smaller than the field assigned to the Sub-Burst.
If this item is set to any value other than MAC PDU, the data of each Sub-Burst remains continuous over the number of frames set in the common parameter Number of Frames. For example, if Number of Frames is set to a value greater than or equal to 2 and PN9fix is set in the data of Sub-Burst#1 in UL HARQ Burst#0 of Zone#1, the data after the Sub-Burst#1, UL HARQ Burst#0, Zone#1 of the first frame is mapped to the data of Sub-Burst#1, UL HARQ Burst#0, Zone#1 of the next frame. Also, if this item is set to other than MAC PDU while MAC PDU is added under Sub-Burst, the set data is mapped as the Sub-Burst data.
When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of the waveform pattern to be generated. The PN data therefore does not have continuity between the end of a waveform pattern and the start of the next waveform pattern. Note also that the PN data changes depending on Sub-Burst when PN9fix or PN15fix is selected.
Refer to Appendix B "User File Format" for details on the user file format.

Sub-Burst Data Type Repeat Data

[Function] Sets the data when Sub-Burst Data Type = 16 bit repeat.

[Default] 0xFFFF

[Setting range] 0x0000 to 0xFFFF

[Remark] This parameter is displayed only when Sub-Burst Data Type = 16 bit repeat.

Sub-Burst Data Type User File

[Function] Specifies the user file when Sub-Burst Data Type = User File.

[Remark] This parameter is displayed only when Sub-Burst Data Type = User File.

MAC PDU Number

[Function] Sets the number of MAC PDUs belonging to the Sub-Burst.

[Default] 0

[Setting range] 0 to 32

[Remark] This parameter is displayed only when Sub-Burst Data Type = MAC PDU.

CRC Error Insertion

[Function] Sets the CRC error added to the end of the Sub-Burst.

[Default] Correct

[Setting range] Correct, Error

[Remark] When Correct is selected, no error is set for the CRC that is added to the Sub-Burst. When Error is selected, CRC error is set by inverting the lower 8 bits of the CRC that is to be added to the Sub-Burst.

Dedicated UL Control Indicator

[Function] Sets the Dedicated DL Control Indicator.

[Default] 0

[Setting range] 0, 1

SDMA Control Info bit

[Function] Sets the SDMA Control Info bit.

[Default] 0

[Setting range] 0, 1

[Remark] Enabled when Dedicated UL Control Indicator =1.

Num SDMA layers

[Function] Sets the Num SDMA layers.

[Default] 0

[Setting range] 0 to 3

[Remark] Enabled when Dedicated UL Control Indicator =1 and SDMA Control Info bit = 1.

Pilot Pattern

[Function] Sets the Pilot Pattern.

[Default] PatternA

[Setting range] PatternA, PatternB, PatternC, PatternD

[Remark] Enabled when Dedicated UL Control Indicator =1 and SDMA Control Info bit = 1.

ACID

[Function] Sets the ACID.

[Default] 0

[Setting range] 0 to 15

AI_SN

[Function] Sets the AI_SN.

[Default] 0

[Setting range] 0, 1

ACK disable

[Function] Sets the ACK disable.

[Default] 0

[Setting range] 0, 1

3.1.4.22 MAC PDU

When a MAC PDU is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. The Burst Data Type parameter must be set to MAC PDU to specify MAC PDU for the data to be mapped to Burst.

The available parameters under MAC PDU are common for Downlink and Uplink.

Data Status

[Function] Enables and disables the MAC PDU.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected MAC PDU is created. In this event, however, error evaluation for the selected MAC PDU is still executed.

MAC PDU Length

[Function] Sets the data length of the MAC PDU.

[Setting range] Display only

Payload Data Length

[Function] Sets the data length of the MAC PDU payload data.

[Default] 0 bytes

[Setting range] 0 to 2041 bytes (when CI = No CRC)
0 to 2037 bytes (when CI = With CRC)
0 to 2047 bytes (when CI = Without Header & CRC)

CID

[Function] Sets the Connection Identifier.

[Default] 0

[Setting range] 0 to 65535

CI

[Function] Sets whether to add CRC of the MAC PDU.

[Default] With CRC

[Setting range] With CRC, No CRC, Without Header & CRC

CRC Error Insertion

[Function] Sets the CRC error added to the end of the MAC PDU.

[Default] Correct

[Setting range] Correct, Error

[Remark] When Correct is selected, no error is set for the CRC that is added to the MAC PDU. When Error is selected, CRC error is set by inverting the lower 16 bits of the CRC that is to be added to the MAC PDU.

Payload Type

[Function] Sets the Payload Data of the MAC PDU.

[Default] 16 bit repeat

[Setting range] 16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, User File

[Remark] If two or more MAC PDUs that have the same Payload Type and the same CID exist in the same frame, the Payload Data of the MAC PDUs becomes continuous data. However, it would not be continuous over MAC PDUs if 16 bit repeat is selected in Payload Data Type. The beginning of the Payload Data of the MAC PDU is the MSB of the value set in 16 bit repeat. Even if the CID is the same, the Payload Data is not continuous between Downlink and Uplink MAC PDUs, as well as between DL-Burst and MAP-Burst MAC PDUs.

If the common parameter Number of Frames is set to a value greater than or equal to 2, the Payload Data of the MAC PDUs with the same Payload Type and the same CID over multiple frames created remains continuous. Therefore, for example, in the waveform pattern where
MAC PDU#2 of Burst#0 of DL Zone#0,
MAC PDU#1 of Burst#2 of DL Zone#0, and
MAC PDU#3 of Burst#0 of DL Zone#1
have the same Payload Type and the same CID and Number of Frames=2, the following will be continuous;

The end of the Zone#0 Burst#0 MAC PDU#2 data of Frame 1 and the start of the Zone#0 Burst#2 MAC PDU#1 data of Frame 1,

The end of the Zone#0 Burst#2 MAC PDU#1 data of Frame 1 and the start of the Zone#1 Burst#0 MAC PDU#3 data of Frame 1,

The end of the Zone#1 Burst#0 MAC PDU#3 data of Frame 1 and the start of the Zone#0 Burst#0 MAC PDU#2 data of Frame 2,

The end of the Zone#0 Burst#0 MAC PDU#2 data of Frame 2 and the start of the Zone#0 Burst#2 MAC PDU#1 data of Frame 2,

The end of the Zone#0 Burst#2 MAC PDU#1 data of Frame 2 and the start of the Zone#1 Burst#0 MAC PDU#3 data of Frame 2.

However, if Zone#2 precedes Zone#1 on the Symbol axis, the data in Zone#1 follows the data in Zone#2.
When PN9fix or PN15fix is selected, the PN data may be cut off halfway according to the length of the waveform pattern to be generated. The PN data therefore does not have continuity between the end of a waveform pattern and the start of the next waveform pattern. Note also that the PN data changes depending on CID when PN9fix or PN15fix is selected.
Refer to Appendix B “User File Format” for details on the user file format.

Payload Type Repeat Data

[Function] Sets the data to be inserted into Payload Data of MAC PDU when Payload Type = 16 bit repeat.

[Default] 0x0000

[Setting range] 0x0000 to 0xFFFF

[Remark] This parameter is displayed only when Payload Type = 16 bit repeat.

Payload Type User File

[Function] Specifies the user file when Payload Type = User File.

[Remark] This parameter is displayed only when Payload Type = User File.

3.1.4.23 Initial/Handover Ranging Region

When an Initial/Handover Ranging Region is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. Note that an Initial/Handover Ranging Region can be added only to an uplink zone, and two or more Initial/Handover Ranging Regions cannot be added into one segment.

Data Status

[Function] Enables and disables the Initial/Handover Ranging Region.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the Initial/Handover Ranging Region is created. In this event, however, error evaluation for the Initial/Handover Ranging Region is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the Initial/Handover Ranging Region.

[Default] OFDMA Symbol Offset of the zone to which the Initial/Handover Ranging Region belongs

[Setting range] The setting range changes depending on the permutation type of the zone to which the Initial/Handover Ranging Region belongs, and OFDMA Symbol Offset and No. OFDMA Symbols set for the zone.

- For zones with Permutation set to PUSC:
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps
- For zones with Permutation set to PUSC (w/o SC rotation):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps
- For zones with Permutation set to AMC (6x1):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 1-symbol steps

- For zones with Permutation set to AMC (3x2): [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps
- For zones with Permutation set to AMC (2x3): [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps
- For Zones with Permutation set to AMC (1x6): [OFDMA Symbol Offset of the zone] to 255 symbols, in 6-symbol steps

[Remark] Set the offset counted from the starting symbol of the UL subframe.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the Initial/Handover Ranging Region.

[Default] 0 (when the Initial/Handover Ranging Region is added on the main screen)
Mouse pointer position (when the Initial/Handover Ranging Region is added on the Segment Edit screen)

[Setting range] 0 to 126 (for PUSC and PUSC (w/o SC rotation))
0 to 120 (for other than PUSC and PUSC (w/o SC rotation))

No. OFDMA Symbols

[Function] Sets the number of OFDMA symbols used.

[Default] 3 symbols (for PUSC)
3 symbols (for PUSC (w/o SC rotation))
3 symbols (for AMC (6x1))
4 symbols (for AMC (3x2)
3 symbols (for AMC (2x3))
6 symbols (for AMC (1x6))

[Setting range] 3 to 126 symbols (for PUSC)
3 to 126 symbols (for PUSC (w/o SC rotation))
1 to 127 symbols (for AMC (6x1))
2 to 126 symbols (for AMC (3x2)
3 to 126 symbols (for AMC (2x3))
6 to 126 symbols (for AMC (1x6))

No. Subchannels

[Function] Sets the number of subchannels used.

[Default] 6 (for PUSC and PUSC (w/o SC rotation))
8 (for other than PUSC and PUSC (w/o SC rotation))

[Setting range] 6 to 126 (for PUSC and PUSC (w/o SC rotation))
8 to 120 (for other than PUSC and PUSC (w/o SC rotation))

[Remark] Setting resolution is 6 for PUSC and PUSC (w/o SC rotation), when not PUSC and PUSC (w/o SC rotation), the setting resolution is 8.

Initial/Handover Ranging Symbols

[Function] Selects the number of symbols used by one Initial/Handover Ranging Burst.

[Default] 2

[Setting range] 2, 4

[Remark] Initial/Handover Ranging Bursts are mapped in units of the number of symbols specified by this parameter.

Initial/Handover Ranging Burst Number

[Function] Sets the number of Initial/Handover Ranging Bursts in the Initial/Handover Ranging Region.

[Default] 1

[Setting range] 1 to 16

Ranging Region Combination

[Function] When this parameter is set to Combine, the right part of the Initial/Handover Ranging Region is changed to BW Request/Periodic Region, into which BW Request/Periodic Ranging Bursts can be added.

[Default] Non

[Setting range] Non, Combine

[Remark] This parameter cannot be set when the BW Request/periodic Region already exists in the Segment in the tree view.

BW Request/Periodic Ranging Offset

[Function] Sets the number of offset symbols for the region separator line when Ranging Region Combination is set to Combine.

[Default] 2

[Setting range] 0 to No. OFDMA Symbol of Initial/Handover Ranging Region

[Remark] The number of offset symbols is based on the left edge of the region. This parameter can be set only when Ranging Region Combination is set to Combine.

BW Request/Periodic Ranging Symbols

[Function] Selects the number of symbols used in one BW Request/ Periodic Region.

[Default] 1

[Setting range] 1, 3

[Remark] BW Request/Periodic Ranging Bursts are mapped in units of the number of symbols specified by this parameter. This parameter can be set only when Ranging Region Combination is set to Combine.

BW Request/Periodic Ranging Burst Number

[Function] Sets the number of BW Request/Periodic Ranging Bursts in the BW Request/Periodic Ranging Region.

[Default] 0

[Setting range] 0 to 16

[Remark] This parameter can be set only when Ranging Region Combination is set to Combine.

3.1.4.24 BW Request/Periodic Ranging Region

When a BW Request/Periodic Ranging Region is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. Note that a BW Request/Periodic Ranging Region can be added only to an uplink zone, and two or more BW Request/Periodic Ranging Regions cannot be added into one segment.

Data Status

[Function] Enables and disables the BW Request/Periodic Ranging Region.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the BW Request/Periodic Ranging Region is created. In this event, however, error evaluation for the BW Request/Periodic Ranging Region is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the BW Request/Periodic Ranging Region.

[Default] OFDMA Symbol Offset of the zone to which the BW Request/Periodic Ranging Region belongs

[Setting range] The setting range changes depending on the permutation type of the zone to which the BW Request/Periodic Ranging Region belongs, and OFDMA Symbol Offset and No. OFDMA Symbols set for the zone.

- For zones with Permutation set to PUSC:
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps
- For zones with Permutation set to PUSC (w/o SC rotation):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps
- For zones with Permutation set to AMC (6x1):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 1-symbol steps
- For zones with Permutation set to AMC (3x2):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 2-symbol steps
- For zones with Permutation set to AMC (2x3):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps

- For Zones with Permutation set to AMC (1x6):
  [OFDMA Symbol Offset of the zone] to 255 symbols, in 6-symbol steps

[Remark] Set the offset counted from the starting symbol of the UL subframe.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the BW Request/Periodic Ranging Region.

[Default] 0 (when the BW Request/Periodic Ranging Region is added on the main screen)
Mouse pointer position (when the BW Request/Periodic Ranging Region is added on the Segment Edit screen)

[Setting range] 0 to 126 (for PUSC and PUSC (w/o SC rotation))
0 to 120 (for other than PUSC and PUSC (w/o SC rotation))

[Remark] Setting resolution is 6 for PUSC and PUSC (w/o SC rotation), when not PUSC and PUSC (w/o SC rotation), the setting resolution is 8.

No. OFDMA Symbols

[Function] Sets the number of OFDMA symbols used.

[Default] 3 symbols (for PUSC)
3 symbols (for PUSC (w/o SC rotation))
1 symbol (for AMC (6x1))
2 symbols (for AMC (3x2)
3 symbols (for AMC (2x3))
6 symbols (for AMC (1x6))

[Setting range] 3 to 126 symbols (for PUSC)
3 to 126 symbols (for PUSC (w/o SC rotation))
1 to 127 symbols (for AMC (6x1))
2 to 126 symbols (for AMC (3x2)
3 to 126 symbols (for AMC (2x3))
6 to 126 symbols (for AMC (1x6))

No. Subchannels

[Function] Sets the number of subchannels used.

[Default] 6 (for PUSC and PUSC (w/o SC rotation))
8 (for other than PUSC and PUSC (w/o SC rotation))

[Setting range] 6 to 126 (for PUSC and PUSC (w/o SC rotation))
8 to 120 (for other than PUSC and PUSC (w/o SC rotation))

[Remark] Setting resolution is 6 for PUSC and PUSC (w/o SC rotation), when not PUSC and PUSC (w/o SC rotation), the setting resolution is 8.

BW Request/Periodic Ranging Symbols

[Function] Selects the number of symbols used by one BW Request/ Periodic Ranging Burst.

[Default] 1

[Setting range] 1, 3

[Remark] BW Request/Periodic Ranging Bursts are mapped in units of the number of symbols specified by this parameter.

BW Request/Periodic Ranging Burst Number

[Function] Sets the number of BW Request/Periodic Ranging Bursts in the BW Request/Periodic Ranging Region.

[Default] 1

[Setting range] 1 to 16

3.1.4.25 Fast-Feedback Region

When a Fast-Feedback Region is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. Note that only a Fast-Feedback Region can be added only to an uplink zone with Permutation set to PUSC or PUSC (w/o SC rotation), and two or more Fast-Feedback Regions cannot be added into one segment.

Data Status

[Function] Enables and disables the Fast-Feedback Region.
[Default] Enable
[Setting range] Enable, Disable
[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the Fast-Feedback Region is created. In this event, however, error evaluation for the Fast-Feedback Region is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the Fast-Feedback Region.
[Default] OFDMA Symbol Offset of the zone to which the Fast-Feedback Region belongs
[Setting range] [OFDMA Symbol Offset] to 255 symbols, in 3-symbol steps
[Remark] Set the offset counted from the starting symbol of the UL subframe.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the Fast-Feedback Region.
[Default] 0 (when the Fast-Feedback Region is added on the main screen)
Mouse pointer position (when the B Fast-Feedback is added on the Segment Edit screen)
[Setting range] 0 to 127

No. OFDMA Symbols

[Function] Sets the number of OFDMA symbols used.
[Default] 3 symbols
[Setting range] 3 to 126 symbols

No. Subchannels
[Function] Sets the number of subchannels used.
[Default] 6
[Setting range] 1 to 127

Fast-Feedback Type
[Function] Displays the number of payload bits of a Fast-Feedback Burst.
[Default] 6
[Setting range] Display only

Fast-Feedback Burst Number
[Function] Sets the number of Fast-Feedback Bursts in the Fast-Feedback Region.
[Default] 1
[Setting range] 1 to 32

3.1.4.26 Initial/Handover Ranging Burst

When an Initial/Handover Ranging Burst is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. Initial/Handover Ranging Bursts can be added only into the Initial/Handover Ranging Region.

Data Status
[Function] Enables and disables the Initial/Handover Ranging Burst.
[Default] Enable
[Setting range] Enable, Disable
[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected Initial/Handover Ranging Burst is created. In this event, however, error evaluation for the selected Initial/Handover Ranging Burst is still executed.

OFDMA Symbol Offset
[Function] Sets the first OFDMA symbol position of the Initial/Handover Ranging Burst.
[Default] 0
[Setting range] The setting range changes depending on the Initial/Handover Ranging Symbols.
- When Initial/Handover Ranging Symbols = 2: 0 to 254 symbols, in 2-symbol steps
- When Initial/Handover Ranging Symbols = 4: 0 to 252 symbols, in 4-symbol steps

[Remark] Set the offset counted from the starting symbol of the Initial/Handover Ranging Region.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the Initial/Handover Ranging Burst.

[Default] 0 (when the Initial/Handover Ranging Burst is added on the main screen)
Mouse pointer position (when the Initial/Handover Ranging Burst is added on the Segment Edit screen)

[Setting range] 0 to 126 (for PUSC and PUSC (w/o SC rotation))
0 to 120 (for other than PUSC and PUSC (w/o SC rotation))

[Remark] Sets offset counted from the header subchannel of Initial/Handover Ranging Region. Setting resolution is 6 for PUSC and PUSC (w/o SC rotation), when not PUSC and PUSC (w/o SC rotation), the setting resolution is 8.

No. OFDMA Symbols

[Function] Displays the number of OFDMA symbols used.

[Default] 2 symbols (when Initial/Handover Ranging Symbols = 2)
4 symbols (when Initial/Handover Ranging Symbols = 4)

[Setting range] Display only

No. Subchannels

[Function] Displays the number of subchannels used.

[Default] 6 (for PUSC and PUSC (w/o SC rotation))
8 (for other than PUSC and PUSC (w/o SC rotation))

[Setting range] Display only

Ranging Power Offset

[Function] Sets the power offset for the Initial/Handover Ranging Burst.

[Default] 0 dB

[Setting range] –10.0 to 10.0 dB

Ranging Code Number

[Function] Sets the ranging code number.

[Default] 0

[Setting range] 0 to 255

[Remark] Refer to Section 3.2.6 “Ranging code” for details on the ranging code.

3.1.4.27 BW Request/Periodic Ranging Burst

When a BW Request/Periodic Ranging Burst is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. BW Request/Periodic Ranging Bursts can be added only into the BW Request/Periodic Ranging Region, and the Initial/Handover Ranging Region with Ranging Region Combination set to Combine.

Data Status

[Function] Enables and disables the BW Request/Periodic Ranging Burst.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected BW Request/Periodic Ranging Burst is created. In this event, however, error evaluation for the selected BW Request/Periodic Ranging Burst is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the BW Request/Periodic Ranging Burst.

[Default] 0

[Setting range] 0 to 255 symbols
Can be set in 1-symbol steps when BW Request/Periodic Ranging Symbols = 1.
Can be set in 3-symbol steps when BW Request/Periodic Ranging Symbols = 3.

[Remark] Set the offset counted from the starting symbol of the BW Request/Periodic Ranging Region. When the selected BW Request/Periodic Ranging Burst belongs to the Initial/Handover Ranging Region, set the offset counted from the starting symbol of the Initial/Handover Ranging Region.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the BW Request/Periodic Ranging Burst.

[Default] 0 (when the BW Request/Periodic Ranging Burst is added on the main screen)
Mouse pointer position (when the BW Request/Periodic Ranging Burst is added on the Segment Edit screen)

[Setting range] 0 to 126 (for PUSC and PUSC (w/o SC rotation))
0 to 120 (for other than PUSC and PUSC (w/o SC rotation))
[Remark] Set the offset counted from the starting subchannel of the BW Request/Periodic Ranging Region. When the selected BW Request/Periodic Ranging Burst belongs to the Initial/Handover Ranging Region, set the offset counted from the starting subchannel of the Initial/Handover Ranging Region.

No. OFDMA Symbols

[Function] Displays the number of OFDMA symbols used.
[Default] 1 symbol (when BW Request/Periodic Ranging Symbols = 1)
3 symbols (when BW Request/Periodic Ranging Symbols = 3)
[Setting range] Display only

No. Subchannels

[Function] Displays the number of subchannels used.
[Default] 6 (for PUSC and PUSC (w/o SC rotation))
8 (for other than PUSC and PUSC (w/o SC rotation))
[Setting range] Display only

Ranging Power Offset

[Function] Sets the power offset for the BW Request/Periodic Ranging Burst.
[Default] 0 dB
[Setting range] –10.0 to 10.0 dB

Ranging Code Number

[Function] Sets the ranging code number.
[Default] 0
[Setting range] 0 to 255
[Remark] Refer to Section 3.2.6 “Ranging code” for details on the ranging code.

3.1.4.28 Fast-Feedback Burst

When a Fast-Feedback Burst is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. Fast-Feedback Burst Bursts can be added only into the Fast-Feedback Burst Region.

Data Status

[Function] Enables and disables the Fast-Feedback Burst.
[Default] Enable
[Setting range] Enable, Disable
[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected Fast-Feedback Burst is created. In this event, however, error evaluation for the selected Fast-Feedback Burst is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the Fast-Feedback Burst.
[Default] 0
[Setting range] 0 to 255 symbols, in 1-symbol steps
[Remark] Set the offset counted from the starting symbol of the Fast-Feedback Region.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the Fast-Feedback Burst.
[Default] 0 (when the Fast-Feedback Burst is added on the main screen)
Mouse pointer position (when the Fast-Feedback Burst is added on the Segment Edit screen)
[Setting range] 0 to 127
[Remark] Set the offset counted from the starting subchannel of the Fast-Feedback Region.

No. OFDMA Symbols

[Function] Displays the number of OFDMA symbols used.
[Default] 3 symbols
[Setting range] Display only

No. Subchannels

[Function] Displays the number of subchannels used.
[Default] 1
[Setting range] Display only

Ranging Power Offset

[Function] Sets the power offset for the Fast-Feedback Burst.
[Default] 0 dB
[Setting range] –10.0 to 10.0 dB

Payload

[Function] Sets a 6-bit payload.
[Default] 000000
[Setting range] 00000 to 111111
[Remark] Enter a binary value.

3.1.4.29 UL-ACK Region

When a UL-ACK Region is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the UL-ACK Region.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected UL-ACK Region is created. In this event, however, error evaluation for the selected UL-ACK Region is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the UL-ACK Region.

[Default] OFDMA Symbol Offset of the zone to which the UL-ACK Region belongs

[Setting range] [OFDMA Symbol Offset of the zone] to 255 symbols, in 3-symbol steps

[Remark] Set the offset counted from the starting symbol of the UL subframe.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the UL-ACK Region.

[Default] 0 (when the UL-ACK Region is added on the main screen)
Mouse pointer position (when the UL-ACK Region is added on the Segment Edit screen)

[Setting range] 0 to 127

No. OFDMA Symbols

[Function] Sets the number of OFDMA symbols used.

[Default] 3 symbols

[Setting range] 3 to 126 symbols

No. Subchannels

[Function] Sets the number of subchannels used.

[Default] 1

[Setting range] 1 to 127

UL-ACK Burst Number

[Function] Sets the number of UL-ACK Bursts in the UL-ACK Region.

[Default] 1

[Setting range] 1 to 32

3.1.4.30 UL-ACK Burst

When a UL-ACK Burst is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. Note that a UL-ACK Burst can be added only to a UL-ACK Region.

Data Status

[Function] Enables and disables the UL-ACK Burst.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the UL-ACK Burst is created. In this event, however, error evaluation for the UL-ACK Burst is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the UL-ACK Burst.

[Default] 0

[Setting range] 0 to 255 symbols, in 3-symbol steps

[Remark] Set the offset counted from the starting symbol of the UL-ACK Region.

OFDMA Subchannel Offset

[Function] Sets the minimum number for subchannels used in the UL-ACK Burst.

[Default] 0 (when the UL-ACK Burst is added on the main screen)
Mouse pointer position (when the UL-ACK Burst is added on the Segment Edit screen)

[Setting range] 0 to 127

[Remark] Set the offset counted from the starting subchannel of the UL-ACK Region.

No. OFDMA Symbols

[Function] Displays the number of OFDMA symbols used.

[Default] 3 symbols

[Setting range] Display only

No. Subchannels

[Function] Displays the number of subchannels used.

[Default] 1

[Setting range] Display only

Occupied half subchannel

[Function] Sets the half subchannel used for the UL-ACK Burst.

[Default] even

[Setting range] even, odd

UL-ACK Burst Power Offset

[Function] Sets the power offset of the UL-ACK Burst.

[Default] 0 dB

[Setting range] −10.0 to 10.0 dB

Payload

[Function] Sets the payload data to be mapped to the UL-ACK Burst.

[Default] ACK

[Setting range] ACK, NACK

3.1.4.31 Sounding Zone

When a Sounding Zone is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the Sounding Zone.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the selected Sounding Zone is created. In this event, however, error evaluation for the selected Sounding Zone is still executed.

OFDMA Symbol Offset

[Function] Sets the first OFDMA symbol position of the Sounding Zone.

[Default] The last symbol of the previous Zone

[Setting range] 0 to 255 symbols

No. OFDMA Symbols

[Function] Sets the number of symbols in the Sounding Zone.

[Default] 1 symbol

[Setting range] 1 to 8

Sounding Type

[Function] Displays the Sounding Type.

[Setting range] Type A (display only)

Send Sounding Report Flag

[Function] Sets the Send Sounding Report Flag.

[Default] 0

[Setting range] 0, 1

Sounding Relevance Flag

[Function] Sets the Sounding Relevance Flag.

[Default] 0

[Setting range] 0, 1

Sounding Relevance

[Function] Sets the Sounding Relevance.

[Default] 0

[Setting range] 0, 1

[Remark] Enabled when Sounding Relevance Flag = 0.

Include additional feedback

[Function] Sets the Include additional feedback.

[Default] No additional feedback

[Setting range] No additional feedback, Channel coefficients, Received pilot coefficients, Feedback message

Shift Value

[Function] Sets the Shift Value.

[Default] 0

[Setting range] 0 to 127

3.1.4.32 Sounding Symbol

When a Sounding Symbol is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the Sounding Symbol.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the Sounding Symbol is created. In this event, however, error evaluation for the Sounding Symbol is still executed.

Separability Type

[Function] Enables and disables the Separability Type.

[Default] All subcarriers

[Setting range] All subcarriers, Decimated subcarriers

Max Cyclic Shift Index P

[Function] Sets the Max Cyclic Shift Index P.

[Default] 32

[Setting range] 4, 8, 16, 32, 9, 18

[Remark] Enabled when Separability Type = All subcarriers. This setting influences the number of CIDs that can be added to the Sounding Symbol.

Decimated Value D

[Function] Sets the Decimated Value D.

[Default] 128

[Setting range] 2, 4, 8, 16, 32, 64, 128, 5

[Remark] Enabled when Separability Type = Decimated subcarriers. This setting influences the number of CIDs that can be added to the Sounding Symbol.

Decimated offset randomization

[Function] Sets the Decimation offset randomization.

[Default] No randomization

[Setting range] No randomization, Pseudo-randomly

[Remark] Enabled when Separability Type = Decimated subcarriers.

Sounding Symbol Index

[Function] Sets the Sounding Symbol Index.

[Default] 1

[Setting range] 1 to 8

Number of CIDs

[Function] Sets the number of CIDs in the Sounding Symbol.

[Default] 1

[Setting range] 1 to 128

3.1.4.33 CID

When a CID is selected in the tree view, the following items are displayed in the PHY/MAC parameter list.

Data Status

[Function] Enables and disables the CID.

[Default] Enable

[Setting range] Enable, Disable

[Remark] When a waveform pattern is created with this parameter set to Disable, a waveform pattern that does not contain the CID is created. In this event, however, error evaluation for the CID is still executed.

Shorted Basic CID

[Function] Sets the Shorted Basic CID.

[Default] 0

[Setting range] 0 to 4095

Power Assignment Method

[Function] Sets the Power Assignment Method.

[Default] Equal power

[Setting range] Equal power, Per subcarrier power limit, Total power limit

Power Boost

[Function] Sets the Power Boost.

[Default] No power boost

[Setting range] No power boost, Power boost

Multi-Antenna Flag

[Function] Sets the Multi-Antenna Flag.

[Default] First antenna only

[Setting range] First antenna only, All antennas

Allocation Mode

[Function] Sets the Allocation Mode.

[Default] Normal

[Setting range] Normal, Band

Start Frequency Band

[Function] Sets the Start Frequency Band.

[Default] 0

[Setting range] When FFT size = 2048: 0 to 95
When FFT size = 1024: 0 to 47
When FFT size = 512: 0 to 23
When FFT size = 128: 0 to 5

[Remark] Enabled when Allocation Mode = Normal.

No. Frequency Bands

[Function] Sets the No. Frequency Bands.

[Default] When FFT size = 2048: 96
When FFT size = 1024: 48
When FFT size = 512: 24
When FFT size = 128: 6

[Setting range] When FFT size = 2048: 1 to 96
When FFT size = 1024: 1 to 48
When FFT size = 512: 1 to 24
When FFT size = 128 1 to 6

[Remark] Enabled when Allocation Mode = Normal.

Band bit map

[Function] Sets the Band bit map.

[Default] When FFT size = 2048, 1024, 512: FFF
When FFT size = 128: 7

[Setting range] When FFT size = 2048, 1024, 512: 0 to FFF
When FFT size = 128: 0 to 7

[Remark] Enabled when Allocation Mode = Band.

Sounding Relevance

[Function] Sets the Sounding Relevance.

[Default] 0

[Setting range] 0, 1

[Remark] Enabled when Send Sounding Report Flag = 1 in the Sounding Zone to which the CID belongs.

Cyclic time shift index m

[Function] Sets the Cyclic time shift index m.

[Default] 0

[Setting range] 0 to [Max Cyclic Shift Index P-1 of the Sounding Symbol to which CID belongs]

[Remark] Enabled when Send Sounding Report Flag = 1 in the Sounding Zone to which the CID belongs.

Decimated Offset d

[Function] Sets the Decimated Offset d.

[Default] 0

[Setting range] 0 to [Decimated Value D -1 of the Sounding Symbol to which CID belongs]

[Remark] Enabled when Separability Type = Decimated subcarriers in the Sounding Symbols to which the CID belongs.

Use same symbol for additional feedback

[Function] Sets the Use same symbol for additional feedback.

[Default] 0

[Setting range] 0, 1

[Remark] Enabled when Include additional feedback = Channel coefficients in the Sounding Zone to which the CID belongs.

Periodicity

[Function] Sets the output frame cycle of the CID.

[Default] Single

[Setting range] Single, 1, 2, 4

3.1.4.34 Pattern Setting

When Pattern Setting is selected in the tree view, the following items are displayed in the PHY/MAC parameter list. The package name, export file name and comment can be set for waveform patterns. The settings are reflected in the Export File screen that is displayed during waveform generation.

Package

[Function] Sets the Package of the waveform pattern.

[Default]

[Setting range] Alphanumeric characters and the following symbols:
! % & ( ) + = ` { } _ - ^ @ [ ]

[Remark] Within 31 characters

Export File Name

[Function] Sets the Export File Name of the waveform pattern.

[Default]

[Setting range] Alphanumeric characters and the following symbols:
! % & ( ) + = ` { } _ - ^ @ [ ]

[Remark] Within 18 characters

Line1 to Line3

[Function] Sets comment for the waveform pattern.

[Default]

[Setting range] Alphanumeric characters

[Remark] Within 38 characters

SG Master/Slave Setting

[Function] Sets the synchronization method of two waveform patterns.

[Default] OFF

[Setting range] ON, OFF (when generating two waveform pattern)
OFF, Master, Slave (when generating one waveform patterns)

[Remark] For details, refer to Appendix E “Connecting Multiple Mainframes”.

3.1.5 Segment Edit screen

When **Show Segment Edit** is selected from the **Edit** menu on the main screen or the Show Segment Edit button is clicked, the Segment Edit screen is displayed.

The Segment Edit screen displays the Zones and Bursts assigned to the Subchannel and OFDMA Symbol in the current setting. The vertical axis of the Segment Edit screen indicates subchannels and the horizontal axis displays the OFDMA symbols.

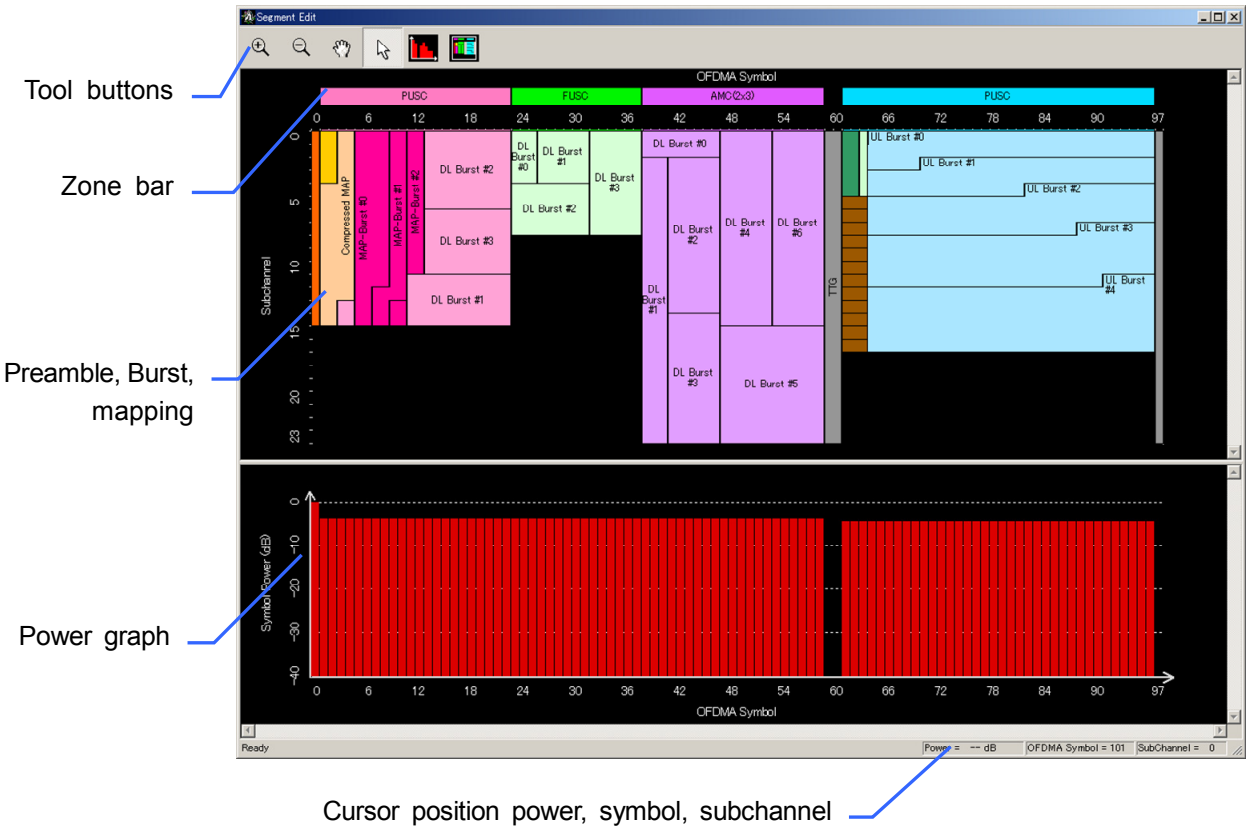


Figure 3.1.5-1 Segment Edit screen

■ The following tool buttons are provided:

- Scale Up button

- Scale Down button

- Hand Tool button

- Select Tool button

- Power graph show/hide button

- Full-screen display button

The button functions are as follows:

■ Scale Up button
Click on the Segment Edit screen when this button is selected (depressed), to magnify the Segment Edit screen view.

■ Scale Down button
Click on the Segment Edit screen when this button is selected (depressed), to reduce the Segment Edit screen view.

■ Hand Tool button
When the Segment Edit screen view is magnified and the outside part of the figure is hidden out of the window, select this button and then click and drag a part on the Segment Edit screen to move (scroll) the display position in the window. The cursor changes to a four-way arrow cursor when this button is selected (depressed).

■ Select Tool button
Select this button to edit the Zones and Bursts displayed in the Segment Edit screen. The cursor changes to an arrow cursor when this button is selected (depressed).

■ Power graph show/hide button
A power graph is displayed in the lower of the Segment Edit screen when this button is selected (depressed).

■ Full-screen display button
Click this button to adjust the scale to display the full screen, showing the entire frame configuration.

3.1.5.1 Selecting and editing areas

This section describes how to add, delete, and move an area such as Zone and Burst, as well as how to change the area size. Click the **Select Tool** button before selecting a Zone, Burst, or any other area.

Adding and deleting an area

To add an area such as Burst, MAP-Burst, and Region, right-click a position to which the target area is to be added to open the pop-up menu shown in Figure 3.1.5.1-1, and then select the target area type. Figure 3.1.5.1-1 shows an example of addition in a DL-zone. Note that a zone can be added from the tree view.

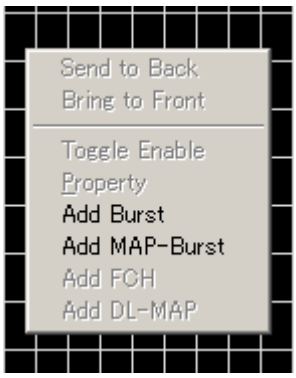


Figure 3.1.5.1-1 Adding an area (addition of Burst or MAP-Burst)

To delete an area such as Burst, MAP-Burst, and Region, right-click the area to be deleted to open the pop-up menu shown in Figure 3.1.5.1-2, and then select **Delete Burst**. Figure 3.1.5.1-2 shows an example of deletion of a UL-Burst area. Note that a zone can be deleted from the tree view.

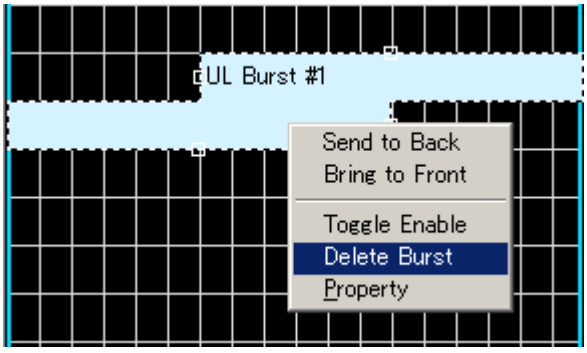


Figure 3.1.5.1-2 Deleting an area (deletion of UL-Burst)

Moving an area

When the area to be selected is hidden behind another area, as shown in Figure 3.1.5.1-3 (a part of the DL Burst#1 area is hidden behind the red-shaded part of the DL Burst#0 area), right-click on the area in front of the target area to open the pop-up menu shown in Figure 3.1.5.1-4. Next, select "Send to Back" from the pop-up menu to send the covering area to back of the target area (see Figure 3.1.5.1-5). On the other hand, when the shaded area is right-clicked and "Bring to Front" is selected from the pop-up menu, the area in the back comes to the front.
When a Zone, Burst, and Region area comes to the front, that area can be moved by clicking and dragging it.

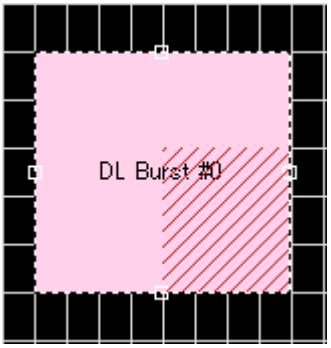


Figure 3.1.5.1-3 Example of overlapping areas

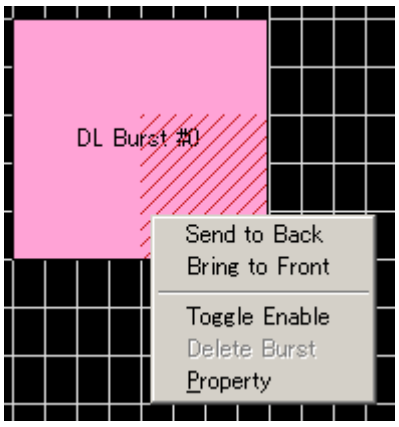


Figure 3.1.5.1-4 Pop-up menu

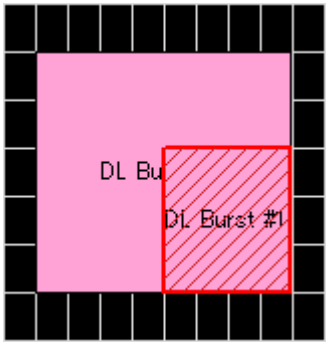


Figure 3.1.5.1-5 After executing Send to Back

Changing the area size

The size of a Burst or Region area can be changed. First, click the target area to make it to the selected state, and then click and drag a square that is displayed on the center of each side of the selected area (see Figure 3.1.5.1-6) to change the area size.
When a Zone area is selected, the number of OFDMA symbols for the Zone can be changed by dragging a square on the center of the left or right side of the area.
When a Burst area is selected, the size of the Burst area can be changed in the OFDMA symbol direction (horizontal) by dragging a square on the center of the left or right side of the area, and the size of the Burst area can be changed in the subchannel direction (vertical) by dragging a square on the center of top or button side of the area.

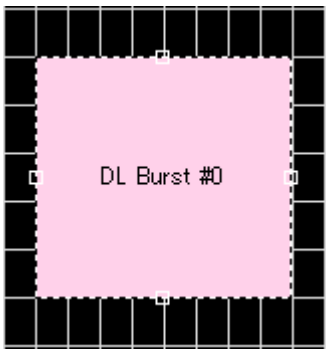


Figure 3.1.5.1-6 Selected area (when DL-Burst #0 is selected)

3.1.5.2 Displaying area information

The information of an area can be displayed in the Segment Edit screen. Click the target area and leave the cursor on the area for a while. The information of the selected area will then be displayed. The information of an area can also be displayed from the pop-up menu. Right-click the target area to display the pop-up menu (see Figure 3.1.5.1-2 above), and then select "Property".

Figs 3.1.5.2-1 and 3.1.5.2-2 show an information display example for a Zone area and Burst area, respectively.

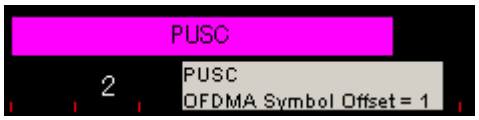


Figure 3.1.5.2-1 Example of Zone area information display

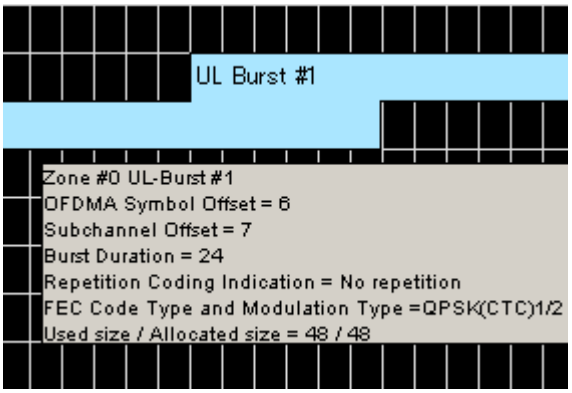


Figure 3.1.5.2-2 Example of Burst area information display

3.1.5.3 Sounding Symbol Edit screen

To display the Sounding Symbol Edit screen in Figure 3.1.5.3-2, right-click “Sounding Symbol” on the Segment Edit screen to display the pop-up menu shown in Figure 3.1.5.3-1, and select “Show Sounding Symbol Edit”.

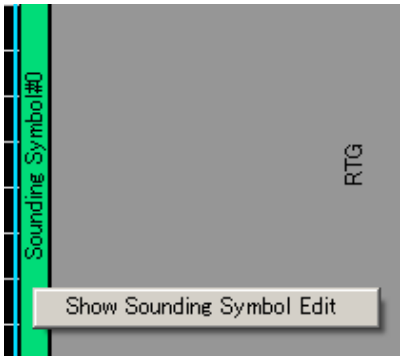


Figure 3.1.5.3-1 Sounding Symbol pop-up menu

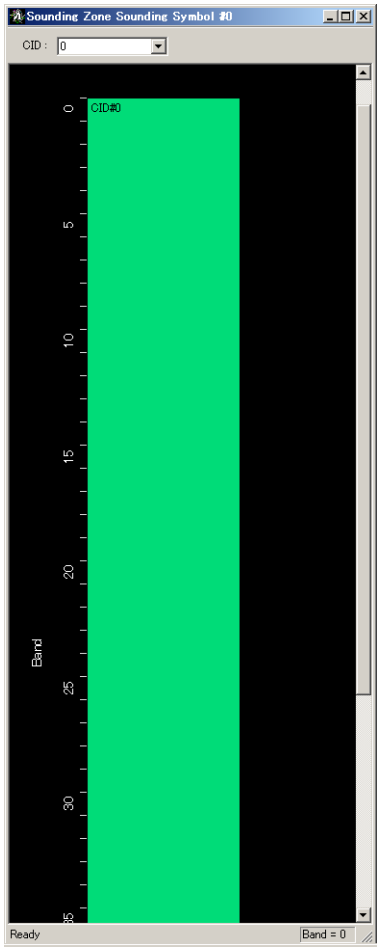


Figure 3.1.5.3-2 Sounding Symbol Edit screen

On the Sounding Symbol Edit screen, the Frequency Band being used can be displayed and edited for each CID. The CID to be displayed can be selected as shown in Figure 3.1.5.3-3.

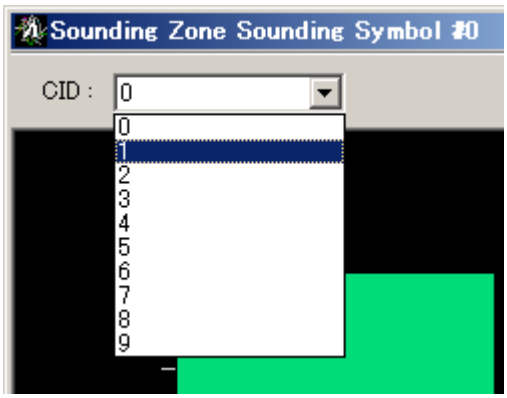


Figure 3.1.5.3-3 Selecting CID to be displayed

For CIDs with Allocation Mode set to Normal, the first Frequency Band and the number of Frequency Bands used can be set on the Sounding Symbol Edit screen. The start Frequency Band can be changed by dragging the CID area as shown in Figure 3.1.5.3-4. The number of Frequency Bands used can be changed by dragging the square displayed in the lower part of the CID area as shown in Figure 3.1.5.3-5.

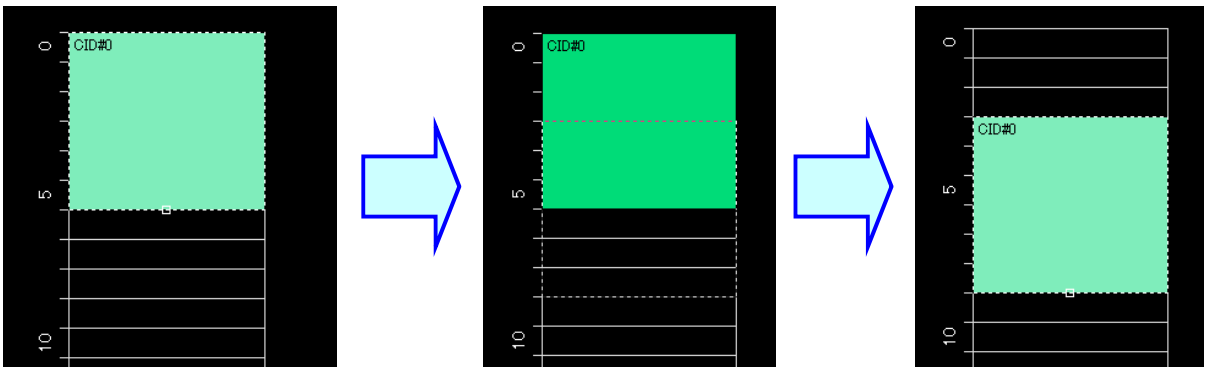


Figure 3.1.5.3-4 Changing Start Frequency Band

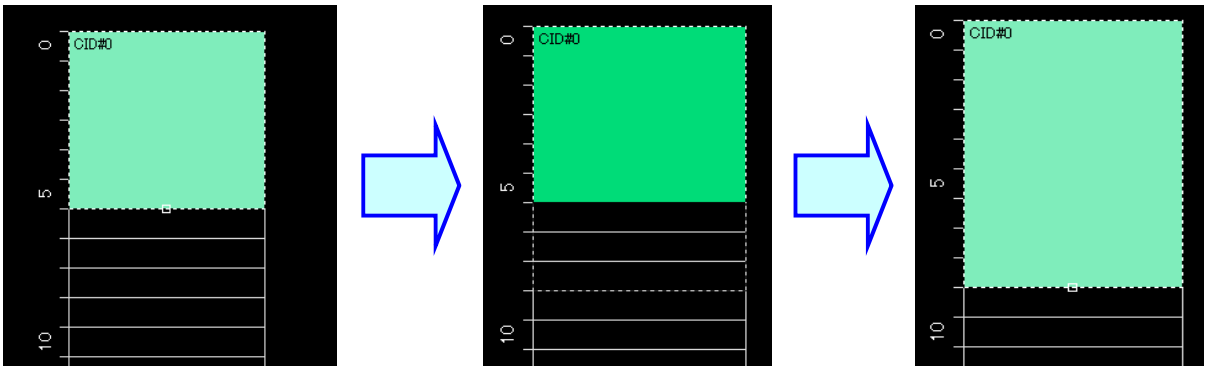


Figure 3.1.5.3-5 Changing number of Frequency Bands used

For CIDs with Allocation Mode set to Band, the bands that are not used according to the Band bit map setting are shaded in gray on the Sounding Symbol Edit screen as shown in Figure 3.1.5.3-6, so the bands that are used and those that are not can be checked. Note that the bands that are used and those that are not cannot be edited on the Sounding Symbol Edit screen at this time.

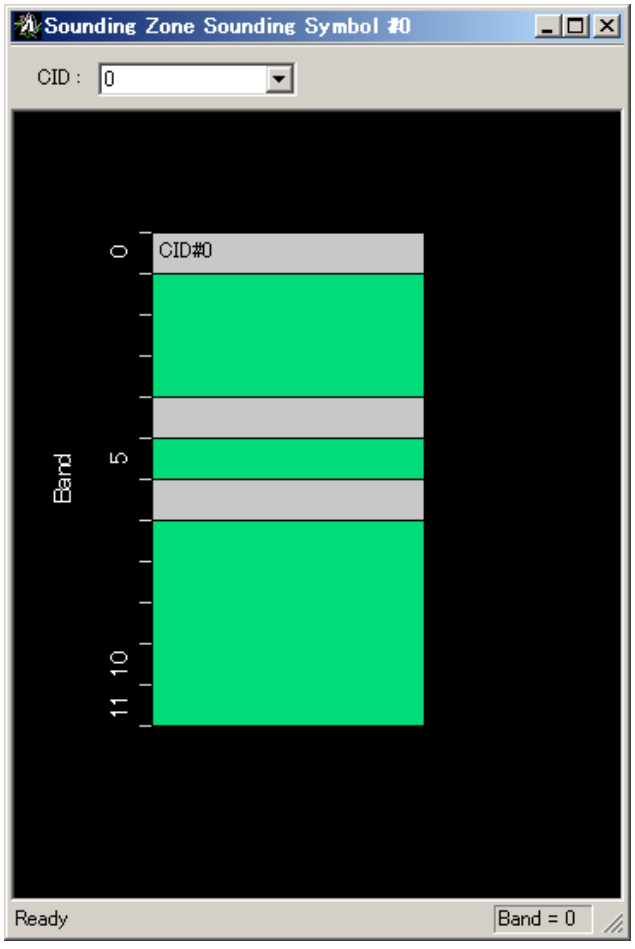
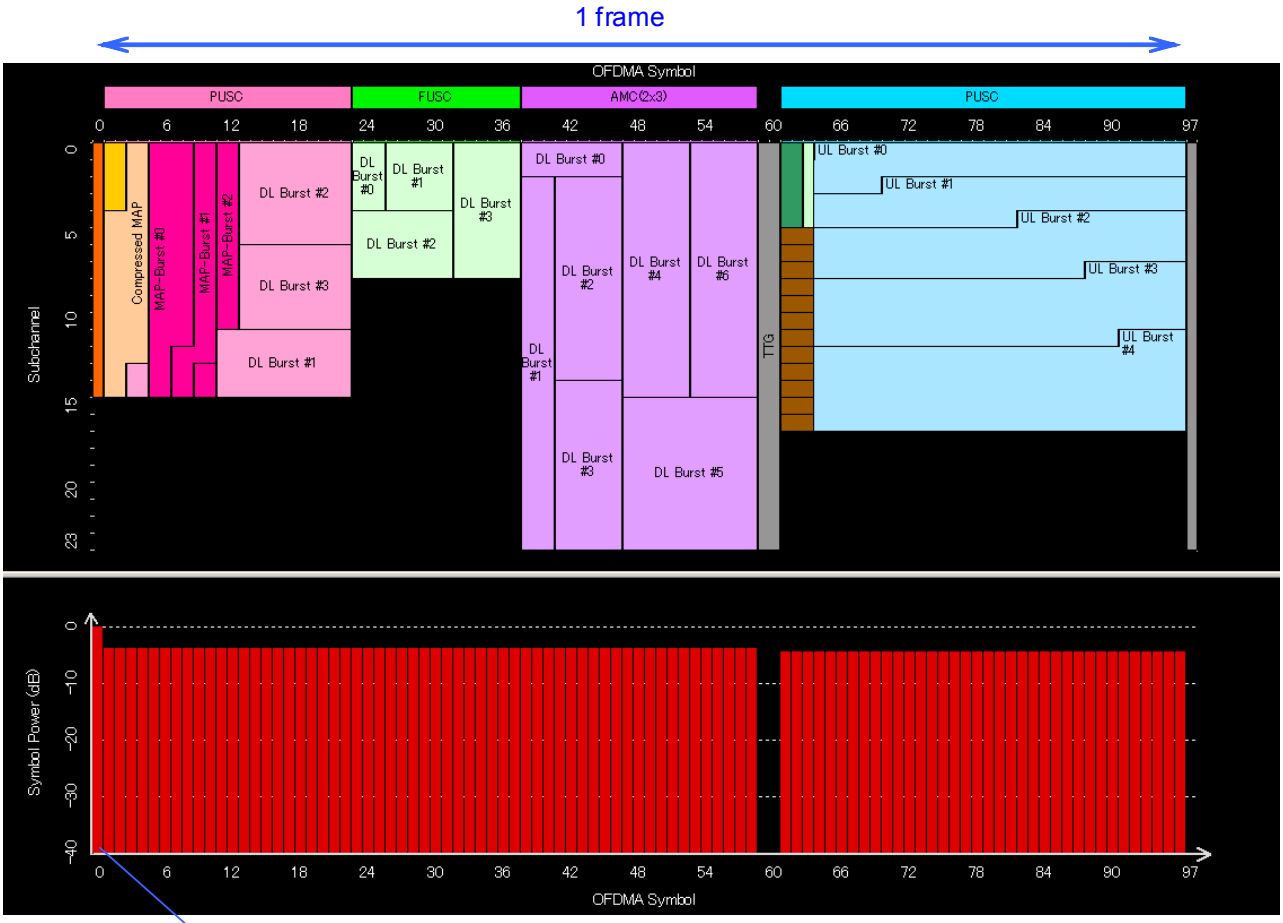


Figure 3.1.5.3-6 CID when Allocation Mode = Band

3.1.6 Output level

In the lower of the Segment Edit screen, the average power of the waveform pattern to be created can be displayed in a power graph, for each OFDMA symbol.
The amplitude of the waveform pattern is adjusted so that signals are output at the RF output level set for the mainframe, at the OFDMA symbol that is indicated as 0 dB in the power graph.



The actual RF output level equals to the RF output level set for the mainframe, at the OFDMA symbol indicated as 0 dB.

Figure 3.1.6-1 Power graph and RF output level

3.1.7 Export File screen

When "Calculation" is selected from the Edit menu or the **Calculation** button is clicked on the main screen, the Export File screen shown in Figure 3.1.7-1 is displayed. At this time, if Number of Tx Antennas is set to 2 and the Multi-Path function is disabled, the Export File is displayed as Figure 3.1.7-2 because two waveform patterns are generated in this event. Refer to Section 3.2.5 "Multi-path processing" for the number of waveform patterns to be generated.

The Export File screen is displayed when generating a waveform pattern. Enter the package name, file name, comment, and set the SG Master/Slave Setting for the waveform pattern to be generated in this screen.

For details on the SG Master/Slave Setting, refer to Appendix E "Connecting Multiple Mainframes".

When the package name, file name and comment are set in the Pattern Setting of the PHY/MAC parameter, they are displayed in this screen.

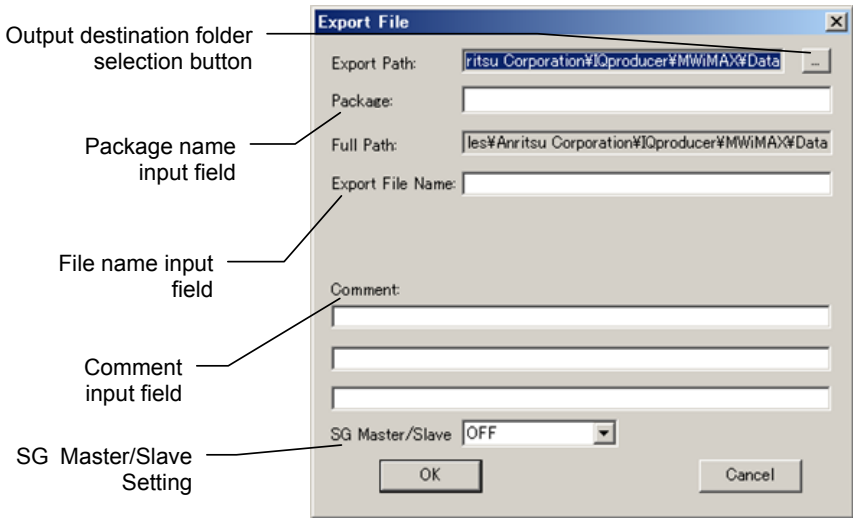


Figure 3.1.7-1 Export File screen (when one waveform pattern is generated)

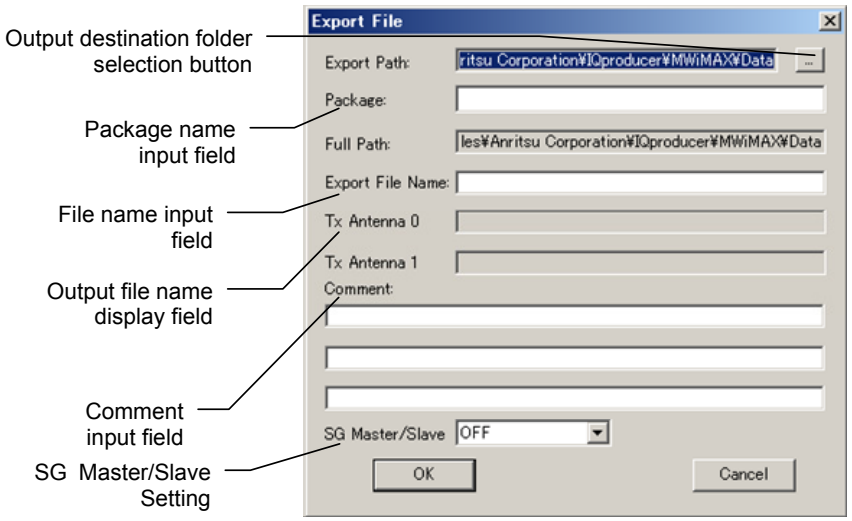


Figure 3.1.7-2 Export File screen (when two waveform patterns are generated)

Only alphanumeric characters and the following symbols can be used for a file name.
! % & ( ) + = ' { } _ - ^ @ [ ]

After setting the package name, file name, and comment for the waveform pattern to be generated, click **OK** on the Export File screen. The Calculation screen shown in Figure 3.1.8-1 is displayed and waveform pattern generation starts (the package name and file name must be set to start waveform pattern generation).

When started with MS269x or MS2830A and when **MS269x** or **MS2830** is selected in the **Select instrument** screen, waveform pattern files generated by this application are saved in the following directory:

Installed OS	Export destination folder
Windows Embedded Standard 7	C:\Anitsu\Signal Analyzer\System\Waveform
Other than above	C:\Program Files\Anritsu Corporation\Signal Analyzer\System\Waveform

When used with MG3710A, the files are saved in the following directory:

C:\Anritsu\MG3710A\User Data\Waveform

In other cases, the output destination folder can be selected from the Browse for Folder screen shown in Figure 3.1.7-3, which is displayed by clicking the output destination folder selection button on the Export File screen (see Figure 3.1.7-1 or 3.1.7-2).

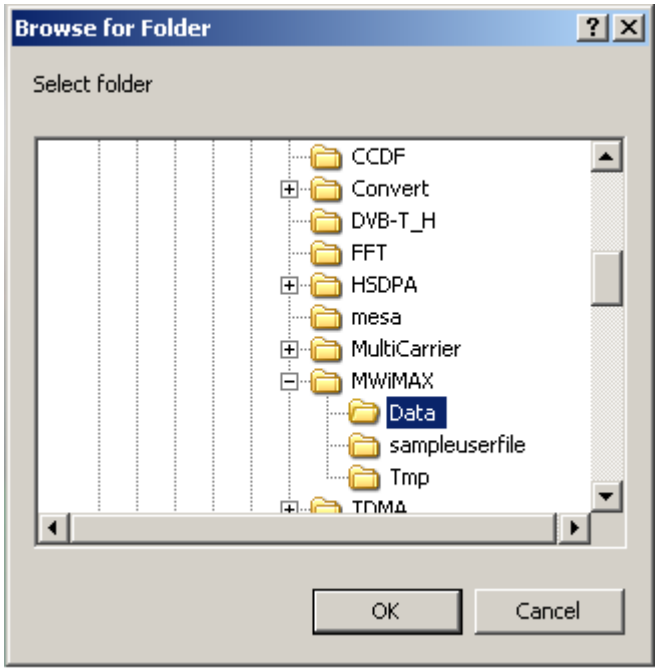


Figure 3.1.7-3 Browse for Folder screen

When the output destination folder is not specified, waveform pattern files are saved in the following directory:
X:\IQproducer\MWiMAX\Data
("X:\IQproducer" indicates the folder where the IQproducer™ is installed.)

3.1.8 Calculation screen

Clicking **Calculation & Load**, **Calculation & Play**, or the **OK** button on the Export File screen will start the waveform generation.

The Calculation screen is displayed while a waveform pattern is being generated. On this screen, the progress bar is displayed indicating the generation process of the waveform pattern and the progress of the waveform pattern generation. The generation of the waveform pattern can be stopped by clicking Cancel. When cancelled, it returns to the main screen.

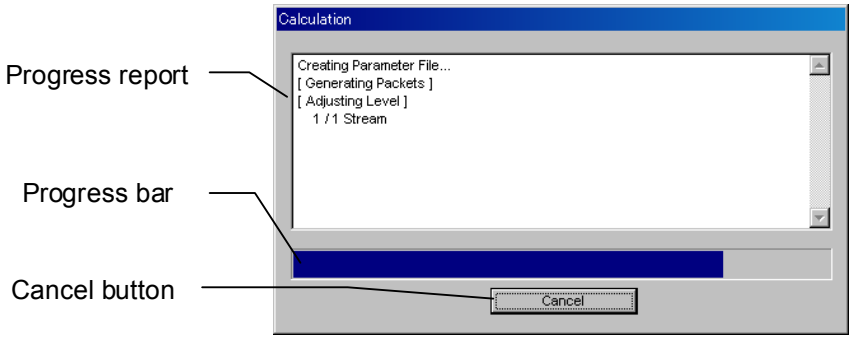


Figure 3.1.8-1 Calculation Screen (In Progress)

After waveform pattern generation is finished, the message "Calculation Completed." is displayed in the progress window and the **Cancel** button changes to the **OK** button.

When the generation is complete, you can return to the setting screen by clicking the **OK** button. After waveform generation, two files with .wvi and .wvd extension are output.

In addition, the screen displaying the generated waveform pattern with "Calculation Completed" also displays the OFDMA symbol in the frames of the generated waveform with the maximum power as well as the average power of the generated waveform. The displayed message contents are listed below.

"max symbol power / avg. power(include gap)"

Displays OFDMA symbol with maximum power in frames as well as average power of entire calculated waveform pattern including gaps (TGG, RTG, etc.) where no signal output.

"max symbol power / avg. power (exclude gap)"

Displays OFDMA symbol with maximum power in frames as well as average power of entire calculated waveform pattern only where signal output (excluding gaps).

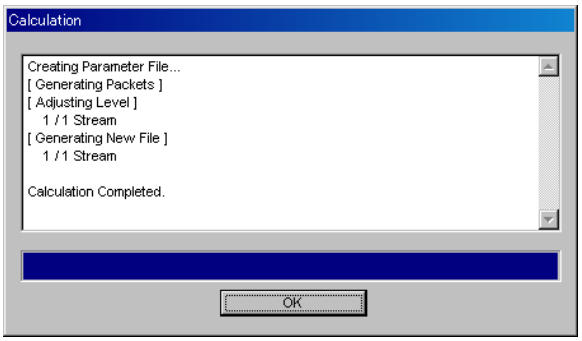


Figure 3.1.8-2 Calculation Screen (Completed)

Note:

When using this software on MG3710A, and selecting **Calculation & Load** or **Calculation & Play**, the waveform generation ends without displaying the above screen.

3.1.9 Calculation & Load

Note:

This function is available only when this software is used on MG3710A.

When **Calculation & Load** is selected, the Load Setting screen will display after waveform generation.

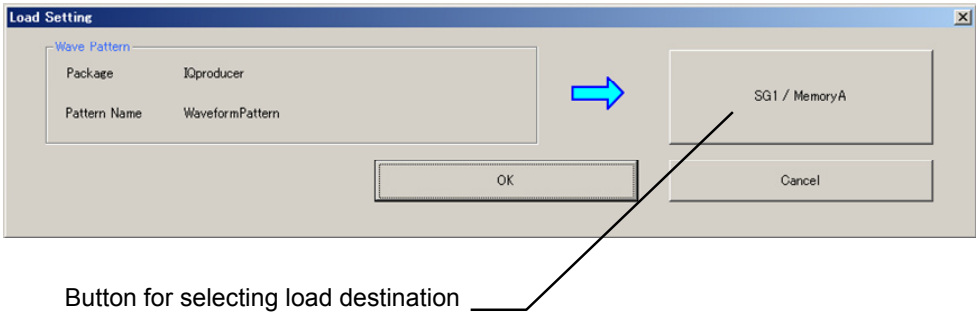


Figure 3.1.9-1 Load Setting Screen

The Select Memory screen will display after clicking the load destination in the Load Setting screen.

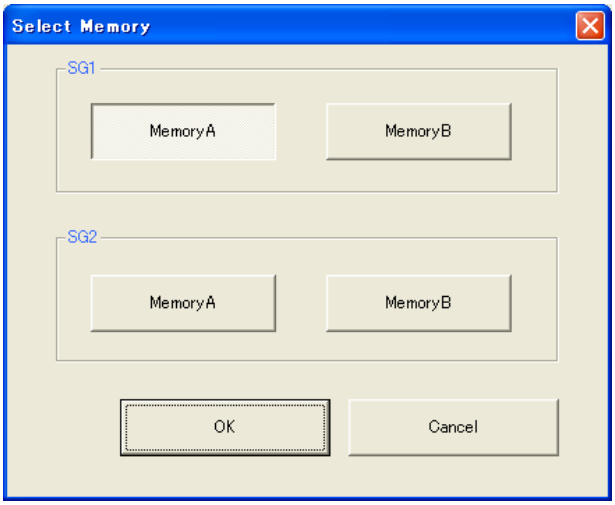


Figure 3.1.9-2 Select Memory Screen

After selecting the load destination of generated waveform in the Select Memory screen and clicking the **OK** button, the Load Setting screen will be shown again. Click the **OK** button in the Load Setting screen, and then the loading of waveform starts.

Note:

To exit this screen without loading the waveform pattern, click the **Cancel** button in the Load Setting screen.

3.1.10 Calculation & Play

Note:

This function is available only when this software is used on MG3710A.

When **Calculation & Play** is selected, after waveform creation is completed, the created waveform is loaded into memory, selected and output.

When the 2nd Vector Signal Generator (option) is installed, the Select SG screen is displayed before the start of waveform generation. This screen is used to select the signal generator for outputting the created waveform pattern.

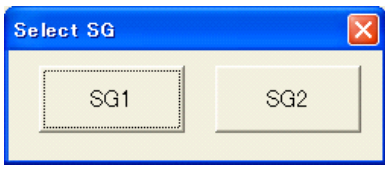


Figure 3.1.10-1 Select SG Screen

3.2 Setting Methods

3.2.1 FCH, DL-MAP, UL-MAP, DCD, UCD

MAC Messages such as FCHs and DL-MAPs can be added to Downlink. The format of the data mapped to the MAC Messages such as FCHs and DL-MAPs are shown below. The prefix "0b" at the beginning of a value indicates that the data is expressed in binary format, "0x" indicates that the data is expressed in hexadecimal format. The data is expressed in decimal format when there is no prefix.

FCH

The following tables show the data format for an FCH when the value of FCH Type is set to "DLFP".

Table 3.2.1-1 Data format for FCH (when FFT size is other than 128)

Syntax	Size	Note
Used subchannel bitmap	6 bits	Bit#0: 0 or 1 (Subchannel group 0) Bit#1: 0 or 1 (Subchannel group 1) Bit#2: 0 or 1 (Subchannel group 2) Bit#3: 0 or 1 (Subchannel group 3) Bit#4: 0 or 1 (Subchannel group 4) Bit#5: 0 or 1 (Subchannel group 5)
Reserved	1 bit	0

Repetition Coding Indication	2 bits	If(No repetition coding used on DL-MAP){
		0b00
		}else if(Repetition coding of 2 used on DL-MAP){
		0b01
		}else if(Repetition coding of 4 used on DL-MAP){
		0b10
		}else if(Repetition coding of 6 used on DL-MAP){
		0b11
		}

Coding Indication	3 bits	If(CC encoding used on DL-MAP){
		0b000
		}else if(CTC encoding used on DL-MAP){
		0b010
		}

DL-MAP Length	8 bits	0 to 255 (DL-MAP Length in slots)
Reserved	4 bits	0

Table 3.2.1-2 Data format for FCH (when FFT size is 128)

Syntax	Size	Note

Used subchannel indicator	1 bit	If(Subchannel 0 is Used for segment 0 or
		Subchannel 1 is Used for segment 1 or
		Subchannel 2 is Used for segment 2){
		0
		}else if (Use All subchannels){
		1
		}

Reserved	1 bit	0

Repetition Coding Indication	2 bits	If(No repetition coding used on DL-MAP){
		0b00
		}else if(Repetition coding of 2 used on DL-MAP){
		0b01
		}else if(Repetition coding of 4 used on DL-MAP){
		0b10
		}else if(Repetition coding of 6 used on DL-MAP){
		0b11
		}

Coding Indication	3 bits	If(CC encoding used on DL-MAP){
		0b000
		}else if(CTC encoding used on DL-MAP){
		0b010
		}

DL-MAP Length	5 bits	0 to 31 (DL-MAP Length in slots)

Table 3.2.1-3 shows the correspondence between the subchannel group of the subchannel bitmap used in FCH and the subchannels used.

Table 3.2.1-3 Correspondence between subchannel group and subchannel count

FFT size	Subchannel group	Subchannel range	FFT size	Subchannel group	Subchannel range
2048	0	0 to 11	512	0	0 to 4
	1	12 to 19		1	N/A
	2	20 to 31		2	5 to 9
	3	32 to 39		3	N/A
	4	40 to 51		4	10 to 14
	5	52 to 59		5	N/A
1024	0	0 to 5	128	0	0
	1	6 to 9		1	N/A
	2	10 to 15		2	1
	3	16 to 19		3	N/A
	4	20 to 25		4	2
	5	26 to 29		5	N/A

DL-MAP

Table 3.2.1-4 shows the data format for DL-MAP when the value of DL-MAP Type is set to “DL-MAP”. Table 3.2.1-5 shows the data format for DL-MAP when the value of DL-MAP Type is set to “Compressed DL-MAP”. To DL-MAP, the Sub-MAP pointer IEs are mapped for the number of added SUB-DL-UL-MAPs, the DL-MAP_IEs (DIUC = 0 to 12) or MIMO DL basic IEs are mapped for the number of Downlink Bursts, the HARQ DL-MAP IEs, DL HARQ Chase sub-burst IEs, and MIMO DL Chase HARQ IEs are mapped for the number as added to the DL-HARQ Bursts, and the DL-MAP_IEs (DIUC = 15) are mapped for the number of Downlink Zones – 1. DL-MAP_IEs (DIUC = 15) are mapped to DL-MAP from Zone#1 and DL-MAP_IEs (DIUC = 15) corresponding to Zone#0 are not mapped to DL-MAP.
Also, MIMO DL basic IEs are mapped instead of DL-MAP IEs (DIUC = 0 to 12) only when the Matrix set for the DL-Burst is different from that set for the Zone.
The order of mapping to the DL-MAP for Sub-MAP pointer IEs, DL-MAP_IEs (DIUC = 0 to 12), HARQ DL-MAP IEs, DL HARQ Chase sub-burst IEs, and DL-MAP_IEs (DIUC=15) is as follows. When a SUB-DL-UL-MAP exists, Sub-MAP pointer IEs for the number of SUB-DL-UL-MAPs are mapped first. After that, IEs are mapped in the order in which they are added to the tree view.
Tables 3.2.1-6 to 3.2.1-18 show the data format for DL-MAP_IE (DIUC = 0 to 12), MIMO DL basic IE, DL-MAP_IE (DIUC = 15), HARQ DL-MAP IE, DL HARQ Chase sub-burst IE, and Sub-MAP pointer IE.

Table 3.2.1-4 Data format for DL-MAP

Syntax	Size	Note
Management Message Type	8 bits	2
PHY Synchronization Field	32 bits	Frame Duration Code (8 bits): 0 to 8 Frame Number (24 bits): 0x000000 to 0xFFFFFF
DCD Count	8 bits	0 to 255
Base Station ID	48 bits	0x000000000000 to 0xFFFFFFFFFFFF
No. OFDMA Symbols	8 bits	(Number of OFDMA symbols in the DL-subframe)

DL-MAP_IEs	Variable	for(i=1;i<=(DL-MAP_IE count);i++){
		DL-MAP_IE()
		}

Padding Nibble	4 bits	Padding to reach byte boundary

Table 3.2.1-5 Data format for Compressed DL-MAP

Syntax	Size	Note
Compressed map indicator	3 bits	0b110
UL-MAP appended	1 bit	0 or 1
Reserved	1 bit	0
Map message length	11 bits	0 to 2047
PHY Synchronization Field	32 bits	Frame Duration Code (8 bits): 0 to 8 Frame Number (24 bits): 0x000000 to 0xFFFFFF
DCD Count	8 bits	0 to 255
Operator ID	8 bits	0 to 255
Sector ID	8 bits	0 to 255
No. OFDMA Symbols	8 bits	0 to 255 (Number of OFDMA symbols in the DL-subframe)
DL IE count	8 bits	0 to 255

DL-MAP_IEs	Variable	for(i=1;i<=(DL-MAP_IE count);i++){
		DL-MAP_IE()
		}

Padding Nibble	4 bits	(Padding to reach byte boundary)

Table 3.2.1-6 Data format for DL-MAP_IE (when DIUC = 0 to 12)

Syntax	Size	Note
DIUC	4 bits	0 to 12
OFDMA symbol offset	8 bits	(OFDMA Symbol Offset of Burst)
Subchannel offset	6 bits	(Subchannel Offset of Burst)

Boosting	3 bits	if(not boosted){ 0b000
		}else if(+6dB){ 0b001
		}else if(-6 dB){ 0b010
		}else if(+9dB){ 0b011
		}else if(+3dB){ 0b100
		}else if(-3dB){ 0b101
		}else if(-9dB){ 0b110
		}else if(-12dB){ 0b111
		}

No. OFDMA Symbols	7 bits	0 to 127 (Number of OFDMA symbols in the DL-subframe)
No. Subchannel	6 bits	0 to 63 (Number of subchannels)

Repetition coding indication	2 bits	if(No repetition coding used on DL-MAP){
		0b00 }
		else if(Repetition coding of 2 used on DL-MAP){
		0b01}
		else if(Repetition coding of 4 used on DL-MAP){
		0b10}
		else if(Repetition coding of 6 used on DL-MAP){
		0b11}

Table 3.2.1-7 Data format for MIMO DL basic IE

Syntax	Size	Note
DIUC	4 bits	14
Extended-2 DIUC	4 bits	11
Length	8 bits	variable
Num_Region	4 bits	0b0000
OFDMA Symbol offset	8 bits	
Subchannel offset	6 bits	
Boosting	3 bits	0b001 (6 dB) 0b010 (−6dB) 0b011 (9 dB) 0b100 (3 dB) 0b101 (−3 dB) 0b110 (−9 dB) 0b111 (−12 dB)
No. OFDMA Symbols	7 bits	
No. Subchannels	6 bits	
Matrix indicator	2 bits	0b00 (Matrix A) 0b01 (Matrix B)
Num_layer	2 bits	0b00
Layer_index	2 bits	0b00
DIUC	4 bits	
Repetition Coding Indication	2 bits	0b00 (No repetition) 0b01 (Repetition coding of 2 used) 0b10 (Repetition coding of 4 used) 0b11 (Repetition coding of 6 used)

Table 3.2.1-8 Data format for DL-MAP_IE (when DIUC = 15, STC DL ZONE IE)

Syntax	Size	Note
DIUC	4 bits	15
Extended DIUC	4 bits	1
Length	4 bits	4
OFDMA symbol offset	8 bits	0 to 255 (OFDMA Symbol Offset of Zone)
Permutation	2 bits	if(PUSC){ 0b00} else if(FUSC){0b01}
Use All SC indicator	1 bit	if(Do not use all subchannels){0} else if(Use all subchannels){1}
STC	2 bits	0b00 (No STC) 0b01 (STC using 2/3 antennas)
Matrix indicator	2 bits	0b00 (Matrix A) 0b01 (Matrix B)
DL_PermBase	5 bits	0 to 31
PRBS_ID	2 bits	0 to 3
AMC Type	2 bits	0b00 (AMC (1x6)) 0b01 (AMC (2x3)) 0b10 (AMC (3x2)) 0b11 (Reserved)
Midamble presence	1 bit	0
Midamble boosting	1 bit	0
2/3 antennas select	1 bit	0 (STC using 2 antennas)
Dedicate Pilots	1 bit	
Reserved	4 bits	0

Table . 3.2.1-9 Data format for DL HARQ MAP IE

Syntax	Size	Note
DIUC	4 bits	14
Extended-2 DIUC	4 bits	7
Length	8 bits	
RCID Type	2 bits	0b00 (Normal CID) 0b01 (RCID11) 0b10 (RCID7) 0b11 (RCID3)
Reserved	2 bits	0
Boosting	3 bits	0b001 (6 dB) 0b010 (−6 dB) 0b011 (9 dB) 0b100 (3 dB) 0b101 (−3 dB) 0b110 (−9 dB) 0b111 (−12 dB)
Region_ID use indicator	1 bits	0
OFDMA symbol offset	8 bits	
Subchannel offset	7 bits	
No. OFDMA symbols	7 bits	
No. subchannels	7 bits	
Rectangular Sub-Burst Indicator	1 bit	
Reserved	2 bits	0
Mode	4 bits	Chase HARQ (0b0000) MIMO Chase HARQ (0b0011)
Sub-burst IE Length	8 bits	
DL HARQ Chase sub-burst IE	Variable	

Table 3.2.1-10 Data format for DL HARQ Chase sub-burst IE

Syntax	Size	Note
N sub burst	4 bits	
N ACK channel	4 bits	
The items below are repeated for the number of Sub-Bursts that are added.		
RCID_IE	Variable	Size changes depending on the RCID Type setting in DL HARQ MAP IE.
Duration	10 bits	
Sub-Burst DIUC Indicator	1 bit	
Reserved	1 bit	
DIUC	4 bits	Used only when Sub-Burst DIUC Indicator = 1.
Repetition Coding Indication	2 bits	0b00 (No repetition) 0b01 (Repetition coding of 2 used) 0b10 (Repetition coding of 4 used) 0b11 (Repetition coding of 6 used) Used only when Sub-Burst DIUC Indicator = 1.
Reserved	2 bits	0 Used only when Sub-Burst DIUC Indicator = 1.
ACID	4 bits	
AI_SN	1 bit	
ACK disable	1 bit	
Dedicated DL Control Indicator	2 bits	
Duration(d)	4 bits	Used only when Dedicated DL Control Indicator = 01 or 11.
Allocation Index	6 bits	Used only when Dedicated DL Control Indicator = 01 or 11 and Duration(d) is 0.
Period(p)	3 bits	Used only when Dedicated DL Control Indicator = 01 or 11 and Duration(d) is other than 0.
Frame offset	3 bits	Used only when Dedicated DL Control Indicator = 01 or 11 and Duration(d) is other than 0.
Dedicated DL Control IE	Variable	Used only when Dedicated DL Control Indicator = 10 or 11.

Table 3.2.1-11 Data format for MIMO DLChase HARQ sub-burst IE

Syntax	Size	Note
N sub burst	4 bits	
N ACK channel	6 bits	
The items below are repeated for the number of Sub-Bursts that are added.		
MU Indicator	1 bit	
Dedicated MIMO DL Control Indicator	1 bit	1
ACK Disable	1 bit	
if(Dedicated MIMO DL Control Indicator = 0){		
RCID_IE	Variable	Size changes depending on the RCID Type setting in DL HARQ MAP IE.
}		
Dedicated MIMO DL Control IE	Variable	
Duration	10 bits	
if(Dedicated MIMO DL Control Indicator = 1){		
RCID_IE		
}		
DIUC	4 bits	
Repetition Coding Indication	2 bits	
if(ACK Disable = 1){		
ACID	4 bits	
AI_SN	1 bits	
}		
Padding bits	–	(Padding to reach nibble boundary)

Table 3.2.1-12 Data format for RCID_IE (for RCID_Type = Normal CID)

Syntax	Size	Note
CID	16 bits	For RCID_Type = Normal CID

Table 3.2.1-13 Data format for RCID_IE (for RCID_Type = RCID11)

Syntax	Size	Note
Prefix	1 bit	0
RCID11	11 bits	Lower 11 bits of CID

Table 3.2.1-14 Data format for RCID_IE (for RCID_Type = RCID7)

Syntax	Size	Note
Prefix	1 bit	0
RCID7	7 bits	Lower 7 bits of CID

Table 3.2.1-15 Data format for RCID_IE (for RCID_Type = RCID3)

Syntax	Size	Note
Prefix	1 bit	0
RCID3	3 bits	Lower 3 bits of CID

Table 3.2.1-16 Dedicated DL Control IE data format

Syntax	Size	Note
Length	4 bits	
Control header	4 bits	
Num SDMA layers	2 bits	Used only when Dedicated DL Control IE = 1.
Padding bits	–	(Padding to reach nibble boundary)

Table 3.2.1-17 Dedicated MIMO DL Control IE data format

Syntax	Size	Note
Length	5 bits	
Control header	3 bits	0b001
N_layer	2 bits	0b00
Matrix	2 bits	0b00 (Matrix A) 0b01 (Matrix B)
if(Dedicated Pilot = 1)		
Num_Beamforming_Stream	2 bits	0b00
}		
Padding bits	–	(Padding to reach nibble boundary)

Table 3.2.1-18 Sub-MAP pointer IE data format

Syntax	Size	Note
DIUC	4 bits	15
Extended DIUC	4 bits	7
Length	4 bits	2
DIUC	4 bits	
No. Slots	8 bits	Same value as Length in SUB-DL-UL-MAP.
Repetition Coding Indication	2 bits	0b00 (No repetition) 0b01 (Repetition coding of 2 used) 0b10 (Repetition coding of 4 used) 0b11 (Repetition coding of 6 used)
MAP Version	2 bits	0b01

Table 3.2.1-19 shows the Frame Duration Codes used in DL-MAP.

Table 3.2.1-19 Frame Duration Code

Frame Duration Code	Frame duration (ms)	Frames per second
1	2.0	500
2	2.5	200
3	4.0	250
4	5.0	200
5	8.0	125
6	10.0	100
7	12.5	80
8	20.0	50

UL-MAP

Table 3.2.1-20 shows the data format for UL-MAP when the value of UL-MAP Type is set to “UL-MAP”. Table 3.2.1-21 shows the data format for UL-MAP when the value of UL-MAP Type is set to “Compressed UL-MAP”. To UL-MAPs in Tables 3.2.1-20 and 3.2.1-21, UL-MAP_IEs (UIUC = 1 to 10) are mapped for the number of Uplink Bursts, HARQ UL MAP IEs and UL HARQ Chase Sub-Burst IEs for the number of UL-HARQ Bursts and Sub-Bursts, and Uplink Zone IEs are mapped for the number of Uplink Zones. At this time, the Uplink Zone IEs are mapped first, and then the UL-MAP_IEs of the UL-Burst in the Uplink Zone are mapped.
When an Initial/Handover Ranging Region, BW Request/Periodic Ranging Region, Fast-Feedback Region, and/or UL-ACK Region is added, the corresponding IE(s) are mapped immediately after mapping of the Uplink Zone IE.
The Sounding Zone allocation IE corresponding to the Sounding Zone is mapped first to UL-MAP, and the UL Sounding Command IE is mapped in the order in which the Sounding Zone is added.

Tables 3.2.1-22 to 3.2.1-31 show the IEs to be mapped to UL-MAP.

Table 3.2.1-20 Data format for UL-MAP

Syntax	Size	Note
Management Message Type	8 bits	3
Reserved	8 bits	0
UCD Count	8 bits	0 to 255
Allocation Start Time	32 bits	(UL Allocation Start Time in PS)
No. OFDMA symbols	8 bits	(Number of OFDMA symbols in the UL-subframe)

UL-MAP_IEs	Variable	for(i=1;i<=(UL-MAP_IE count);i++){
		UL-MAP_IE()
		}

Padding Nibble	4 bits	(Padding to reach byte boundary)

Table 3.2.1-21 Data format for Compressed UL-MAP

Syntax	Size	Note
UCD Count	8 bits	0 to 255
Allocation Start Time	32 bits	(UL Allocation Start Time in PS)
No. OFDMA Symbols	8 bits	(Number of OFDMA symbols in the UL-subframe)

UL-MAP_IEs	Variable	for(i=1;i<=(UL-MAP_IE count);i++){
		UL-MAP_IE()
		}

Padding Nibble	4 bits	(Padding to reach byte boundary)

Table 3.2.1-22 Data format for UL-MAP_IE (when UIUC = 1 to 10)

Syntax	Size	Note
CID	16 bits	0 to 65535
UIUC	4 bits	1 to 10
Duration	10 bits	Burst Duration in slots

Repetition coding indication	2 bits	if(No repetition coding used on UL-MAP){
		0b00}
		else if(Repetition coding of 2 used on UL-MAP){
		0b01}
		else if(Repetition coding of 4 used on UL-MAP){
		0b10}
		else if(Repetition coding of 6 used on UL-MAP){
		0b11}

Slot offset	12 bits	Set for AMC (6x1), AMC (3x2), AMC (2x3), and AMC (1x6) only.

Table 3.2.1-23 Data format for Uplink Zone IE

Syntax	Size	Note
CID	16 bits	65535 (0xFFFF)
UIUC	4 bits	15
Extended UIUC	4 bits	4
Length	4 bits	3
OFDMA symbol offset	7 bits	OFDMA Symbol Offset of Zone
Permutation	2 bits	0
AMC Type	2 bits	0
Use All SC indicator	1 bit	1
Reserved	5 bits	0

Table 3.2.1-24 Data format for UL-MAP_IE (UIUC = 12)

Syntax	Size	Note
CID	16 bits	65535 (0xFFFF)
UIUC	4 bits	12
OFDMA Symbol Offset	8 bits	
Subchannel Offset	7 bits	
No. OFDMA Symbols	7 bits	
No. Subchannels	7 bits	

Ranging method	2 bits	if(Initial/Handover Ranging (2 symbols)){
		0b00 }
		else if(Initial/Handover Ranging (4 symbols)){
		0b01}
		else if(BW Request/Periodic Ranging(1 symbol)){
		0b10}
		else if(BW Request/Periodic Ranging(3 symbols)){
		0b11}

Dedicated ranging indicator	1 bit	0

Table 3.2.1-25 Data format for Fast-Feedback Allocation IE

Syntax	Size	Note
CID	16 bits	65535 (0xFFFF)
UIUC	4 bits	0
OFDMA Symbol Offset	8 bits	
Subchannel Offset	7 bits	
No. OFDMA Symbols	7 bits	
No. Subchannels	7 bits	
Reserved	3 bits	0

Table 3.2.1-26 Data format for ACKCH region allocation IE

Syntax	Size	Note
CID	16 bits	65535 (0xFFFF)
UIUC	4 bits	11
Extended-2 UIUC	4 bits	8
Length	8 bits	3
OFDMA Symbol Offset	8 bits	
Subchannel Offset	7 bits	
No. OFDMA Symbols	5 bits	
No. Subchannels	4 bits	

Table 3.2.1-27 Data format for Sounding Zone allocation IE

Syntax	Size	Note
CID	16 bits	65535 (0xFFFF)
UIUC	4 bits	13
OFDMA Symbol Offset	8 bits	
Subchannel Offset	7 bits	0
No. OFDMA Symbols	7 bits	
Shift Value	7 bits	
PAPR Reduction/Safety Zone	1 bit	0
Sounding Zone	1 bit	1
Reserved	1 bit	0

Table 3.2.1-28 Data format for UL Sounding Command IE

Syntax	Size	Note
CID	16 bits	0
UIUC	4 bits	11
Extended-2 UIUC	4 bits	4
Length	8 bits	
Sounding Type	1 bit	0 (Type A)
Send Sounding Report Flag	1 bit	
Sounding Relevance Flag	1 bit	
if(Sounding Relevance Flag = 1){	–	–
Sounding Relevance	1 bit	
Reserved	2 bits	
} else {	–	–
Reserved	3 bits	–
}		
Include additional feedback	2 bits	0b00 (No additional feedback) 0b01 (Channel coefficients) 0b10 (Received pilot coefficients) 0b11 (Feedback message)
No. Sounding symbols	3 bits	
Reserved	1 bit	0
The items below are repeated for the number of Sounding Symbols.		
Separability Type	1 bit	0 (All subcarriers) 1 (Decimated subcarriers)
if(Separability Type = 0) {	–	–
Max Cyclic Shift Index P	3 bits	0b000 (4) 0b001 (8) 0b010 (16) 0b011 (32) 0b100 (9) 0b101 (18)
Reserved	1 bit	0
} else {	–	–
Decimation Value D	3 bits	
Decimation offset randomization	1 bit	
}	–	–
Sounding symbol index	3 bits	
Number of CIDs	7 bits	Total number of CIDs added under Sounding Symbol.
Reserved	1 bit	0

Table 3.2.1-28 Data format for UL Sounding Command IE (Cont'd)

Syntax	Size	Note
The items below are repeated for the number of Sounding Symbols.		
Shorted basic CID	12 bits	
Power Assignment Method	2 bits	0b00 (Equal power) 0b10 (Per subcarrier power limit) 0b11 (Total power limit)
Power boost	1 bit	0 (No power boost) 1 (Power boost)
Multi-Antenna Flag	1 bit	0 (First antenna only) 1 (All antennas)
Allocation Mode	1 bit	0 (Normal) 1 (Band)
if(Allocation Mode = 1) {	–	–
Band bit map	12 bits	
Reserved	2 bits	0
} else {	–	–
Start Frequency Band	7 bits	
No. Frequency Band	7 bits	
}	–	–
if(Sounding Relevance Flag = 1) {	–	–
Sounding Relevance	1 bit	
}	–	–
Reserved	1 bit	0
}	–	–
if(Separability Type = 0) {	–	–
Cyclic time shift index m	5 bits	
} else {	–	–
Decimated Offset d	6 bits	
if(Include additional feedback = 0b01) {	–	–
Use same symbol for additional feedback	1 bit	
Reserved	2 bits	0
} else {	–	–
Reserved	3 bits	0
}	–	–
}	–	–
Periodicity	3 bits	
Padding Nibble	–	(Padding to reach byte boundary)

Table 3.2.1-29 Data format for HARQ UL MAP IE

Syntax	Size	Note
CID	16 bits	65535 (0xFFFF)
UIUC	4 bits	11
Extended-2 UIUC	4 bits	7
Length	8 bits	
RCID_Type	2 bits	0b00 (Normal CID) 0b01 (RCID11) 0b10 (RCID7) 0b11 (RCID3)
Reserved	2 bits	0
Mode	3 bits	0b000
Allocation Start Indication	1 bit	
if(Allocation Start Indication = 1){		
OFDMA Symbol offset	8 bits	OFDMA Symbol Offset of UL-HARQ Burst
Subchannel offset	7 bits	OFDMA Subchannel Offset of UL-HARQ Burst
Reserved	1 bit	0
N sub Burst	4 bits	Number of Sub-Bursts added to UL-HARQ Burst.
UL HARQ Chase Sub-Burst IE	–	–

Table 3.2.1-30 Data format for UL HARQ Chase Sub-Burst IE

Syntax	Size	Note
RCID IE()	Variable	Size changes depending on the RCID Type setting in UL HARQ MAP IE.
Dedicated UL Control Indicator	1 bit	
if(Dedicated UL Control Indicator = 1) {	–	–
Dedicated UL Control IE()	Variable	–
}	–	–
UIUC	4 bits	
Repetition Coding Indication	2 bits	0b00 (No repetition) 0b01 (Repetition coding of 2 used) 0b10 (Repetition coding of 4 used) 0b11 (Repetition coding of 6 used)
Duration	10 bits	
ACID	4 bits	
AI_SN	1 bit	
ACK disable	1 bit	
Reserved	1 bit	0

Table 3.2.1-31 Data format for Dedicated UL Control IE

Syntax	Size	Note
Length	4 bits	
Control header	4 bits	Same as the setting value of SDMA Control Info bit
If(SDMA Control Info bit = 1) {	–	–
Num SDMA layers	2 bits	
Pilot pattern	2 bits	0b00 (PatternA) 0b01 (PatternB) 0b10 (PatternC) 0b11 (PatternD)
}	–	–

SUB-DL-UL-MAP

Table 3.2.1-32 shows the data format for SUB-DL-UL-MAP. DL-MAP IE and UL-MAP IE corresponding to DL-Burst, DL-HARQ Burst, UL-Burst and UL-HARQ Burst for which SUB-DL-UP-MAP is specified in Inclusion MAP are set for the DL-MAP IE and UL-MAP IE in the data format.

Table 3.2.1-32 Data format for SUB-DL-UL-MAP

Syntax	Size	Note
SUB-DL-UL map indicator	3 bits	0b111
Map message length	10 bits	
RCID_Type	2 bits	0b00 (Normal CID) 0b01 (RCID11) 0b10 (RCID7) 0b11 (RCID3)
HARQ ACK offset indicator	1 bit	
if(HARQ ACK offset indicator = 1) {	–	–
DL HARQ ACK offset	8 bits	
UL HARQ ACK offset	8 bits	
}	–	–
DL IE Count	8 bits	
DL-MAP IE	variable	DL-MAP IE, which corresponds to DL-Burst and DL-HARQ Burst for which SUB-DL-UL-MAP is specified in Inclusion MAP, is set.
OFDMA Symbol offset	8 bits	
Subchannel offset	7 bits	
Reserved	1 bit	0
UL-MAP IE	Variable	UL-MAP IE, which corresponds to UL-Burst and UL-HARQ Burst for which SUB-DL-UL-MAP is specified in Inclusion MAP, is set.
Padding Nibble	–	(Padding to reach byte boundary)

DCD

Table 3.2.1-33 shows the data format for DCD. The data format shown in Table 3.2.1-34 is set for TLV encoded information. The Type and Length for TLV encoded information is as shown in Table 3.3.2-35 for each item of TLV encoded information. Of these, Trigger Type, Trigger Function, Trigger Action, Trigger Value and Trigger averaging Duration are processed as one TLV encoded information.
Data is set in the format shown in Table 3.2.1-36 for Downlink_Burst_Profiles. Values corresponding to the FEC Type shown in Table 3.2.1-37 are set for the FEC Type in the Downlink_Burst_Profiles data format.

Table 3.2.1-33 Data format for DCD

Syntax	Size	Note
Management Message Type	8 bits	1
Reserved	8 bits	0
Configuration Change Count	8 bits	0 to 255
TLV encoded information	Variable	
Downlink_Burst_Profiles	Variable	

Table 3.2.1-34 Data format for TLV encoded information

Syntax	Size	Note
Type	8 bits	1
Length	8 bits	4
Value	Variable	Number of bytes specified in Length

Table 3.2.1-35 TLV encoded information Type and Length

TLV Encoded Information	Type	Length
Frequency	12	4
Base Station ID	13	6
MAC version	148	1
BS EIRP	2	2
TTG	7	2
RTG	8	1
EIRxP_IR_MAX	9	2
HO Type Support	50	1
Paging Group ID	35	2
Trigger Type Trigger Function Trigger Action Trigger Value Trigger averaging Duration	54	3
BS Restart Count	154	1
Default RSSI and CINR averaging parameter	21	1
DL AMC Allocation Physical Bands Bitmap	22	6
Hysteresis margin	51	1
Time to trigger duration	52	1

Table 3.2.1-36 Data format for Downlink_Burst_Profile

Syntax	Size	Note
Type	8 bits	1
Length	8 bits	4
Reserved	4 bits	0
DIUC	4 bits	0 to 12
Type	8 bits	150
Length	8 bits	1
FEC Type	8 bits	Values corresponding to FEC Type as in Table 3.2.1-37 are set.

Table 3.2.1-37 FEC Type and Value

FEC Type	Value
QPSK(CC)1/2	0
QPSK(CC)3/4	1
16QAM(CC)1/2	2
16QAM(CC)3/4	3
64QAM(CC)1/2	4
64QAM(CC)2/3	5
64QAM(CC)3/4	6
QPSK(CTC)1/2	13
QPSK(CTC)3/4	15
16QAM(CTC)1/2	16
16QAM(CTC)3/4	17
64QAM(CTC)1/2	18
64QAM(CTC)2/3	19
64QAM(CTC)3/4	20
64QAM(CTC)5/6	21

UCD

Table 3.2.1-38 shows the data format for UCD. As with DCD, the data format shown in Table 3.2.1-34 is set for TLV encoded information. The Type and Length for TLV encoded information is as shown in Table 3.3.2-39 for each item of TLV encoded information.
Data is set in the format shown in Table 3.2.1-40 for Uplink_Burst_Profiles. Values corresponding to the FEC Type shown in Table 3.2.1-37 are set for the FEC Type in the Uplink_Burst_Profiles data format.

Table. 3.2.1-38 Data format for UCD

Syntax	Size	Note
Management Message Type	8 bits	0
Configuration Change Count	8 bits	0 to 255
Ranging Backoff Start	8 bits	0 to 255
Ranging Backoff End	8 bits	0 to 255
Request Backoff Start	8 bits	0 to 255
Request Backoff End	8 bits	0 to 255
TLV encoded information	Variable	
Uplink_Burst_Profiles	Variable	

Table 3.2.1-39 TLV encoded information Type and Length

TLV Encoded Information	Type	Length
Frequency	5	4
Contention-based Reservation Timeout	2	1
Start of Ranging Coded Group	155	1
Band AMC Allocation Threshold	159	1
Band AMC Release Threshold	160	1
Band AMC Allocation Timer	161	1
Band AMC Release Timer	162	1
Band AMC Status Reporting Max Period	163	1
Band AMC Retry Timer	164	1
Normalized C/N Override-2	177	8
Use CQICH Indication Flag	189	1
Handover Raging Codes	194	1
Initial Ranging Codes	150	1
Initial Ranging interval	195	1
Tx Power Report	196	3
Normalized C/N for Channel Sounding	197	1
Initial Ranging Backoff Start	198	1
Initial Ranging Backoff End	199	1

Table 3.2.1-39 TLV encoded information Type and Length (Cont'd)

TLV Encoded Information	Type	Length
Bandwidth Request Backoff Start	200	1
Bandwidth Request Backoff End	201	1
Permutation Base	156	1
UL Allocation subchannel bitmap	157	9
HARQ Ack Delay for DL burst	171	1
UL AMC allocated physical bands bitmap	18	6
Size of CQICH-ID field	176	1
Band-AMC entry average CINR	185	1
HO Ranging Start	7	1
HO Ranging End	8	1
Periodic Ranging Codes	151	1
Bandwidth Request Codes	152	1
Periodic Ranging Backoff Start	153	1
Periodic Ranging Backoff End	154	1
CQICH Band AMC Transition Delay	172	1
Ranging Data Ratio	151	1

Table 3.2.1-40 Data format of Uplink_Burst_Profile

Syntax	Size	Note
Type	8 bits	1
Length	8 bits	0
Reserved	4 bits	0
UIUC	4 bits	1 to 10
Type	8 bits	150
Length	8 bits	1
FEC Type	8 bits	Values corresponding to FEC Type as in Table 3.2.1-32 are set.

3.2.2 Uplink Allocation Start Time setting method

This section describes how to set Uplink Allocation Start Time, a common parameter, using the parameter settings provided in Section 5.3 "Waveform Pattern Generation Procedure" as an example.

The unit of Uplink Allocation Start Time is PS, which is defined as 4/Fs, where Fs = Sampling Frequency / Oversampling Ratio. In the setting example of Section 3.2, it is configured so that Downlink is set to 35 OFDMA symbols and TTG is set to 296 PS.

In order to convert 35 OFDMA symbols of Downlink to the PS unit, it is necessary to calculate how much PS is equivalent to one OFDMA symbol. One OFDMA symbol can be converted to the PS unit, using the following expression:
(FFT size + (FFT size × G)) / 4

Since FFT size = 1024 and G = 1/8 are assumed in the example of Section 3.2, one OFDMA symbol is converted to the PS units as follows:
(1024 + (1024 × 1/8)) / 4 = 288 PS

Uplink Allocation Start Time is calculated by adding 296 PS of TTG to 35 OFDMA symbols of Downlink. Uplink Allocation Start Time is therefore obtained as follows:
(288 × 35) + 296 = 10376 PS

3.2.3 Settable number of subchannels

The settable number of subchannels to which Bursts and Regions can be allocated changes, depending on downlink/uplink, zone permutation type, and settings of the FFT Size and Used Subchannel Bitmap.

Table 3.2.3-1 lists the number of subchannels for each zone. For downlink PUSC, the number of subchannels to be used in a zone can be set by Used Subchannel Bitmap.

Table 3.2.3-1 Number of subchannels for each zone

		FFT Size			
		128	512	1024	2048
Downlink	PUSC	3	15	30	60
	PUSC (all SC)	3	15	30	60
	FUSC	2	8	16	32
	AMC (6x1)	2	8	16	32
	AMC (3x2)	4	16	32	64
	AMC (2x3)	6	24	48	96
	AMC (1x6)	12	48	96	192
Uplink	PUSC	4	17	35	70
	PUSC (w/o SC rotation)	4	17	35	70
	AMC (6x1)	2	8	16	32
	AMC (3x2)	4	16	32	64
	AMC (2x3)	6	24	48	96
	AMC (1x6)	12	48	96	192

3.2.4 STC/MIMO

When Number of Tx Antennas is set to 2, STC/MIMO can be set to “2 Antenna MatrixA (STTD)” or “2 Antenna MatrixB vertical encoding” for downlink zones, except Zone#0, for which Permutation is set to PUSC, PUSC (all SC). For downlink zones with STC/MIMO set to “2 Antenna MatrixA (STTD)” or “2 Antenna MatrixB vertical encoding”, a waveform pattern with a pilot pattern as shown in Figure 3.2.4-1 is generated.

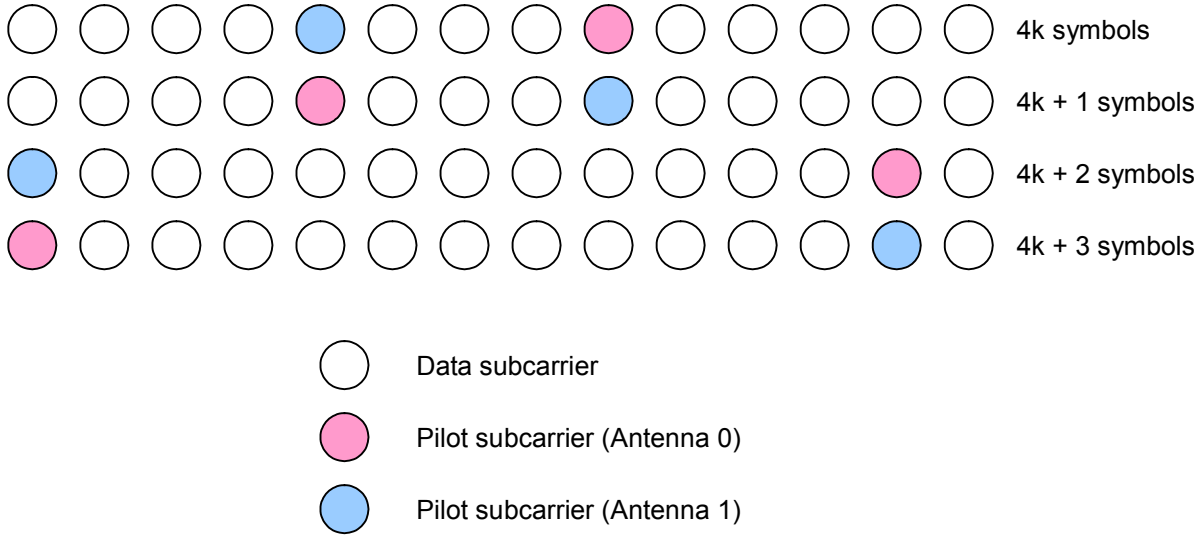


Figure 3.2.4-1 Pilot patterns

3.2.5 Multi-path processing

In multi-path processing, a multi-path multiple wave can be generated by setting the number of paths, and delay, gain, and phase of each path.

When waveform generation is executed with the multi-path processing disabled, a waveform pattern is generated so that it corresponds to a signal from a transmission antenna that is not a multi-path multiple wave. At this time, if Number of Tx Antennas is set to 2, a waveform pattern is generated for a signal from each transmission antenna, so two waveform patterns are generated as a result.

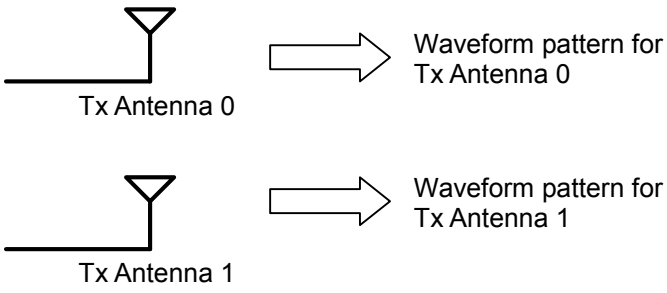


Figure 3.2.5-1 When multi-path processing is disabled (Number of Tx Antennas = 2)

When waveform generation is executed with the multi-path processing enabled, a multi-path multiple wave is generated, in which signals from a transmission antenna are multiplexed. At this time, if Number of Tx Antennas is set to 2, multi-path processing is performed for signals from two transmission antennas, and a waveform pattern that multiplexes these signals is generated. This makes it possible to simulate a signal (to be received by a reception antenna) in which multi-path multiple waves of transmission antennas 0 and 1 are multiplexed.

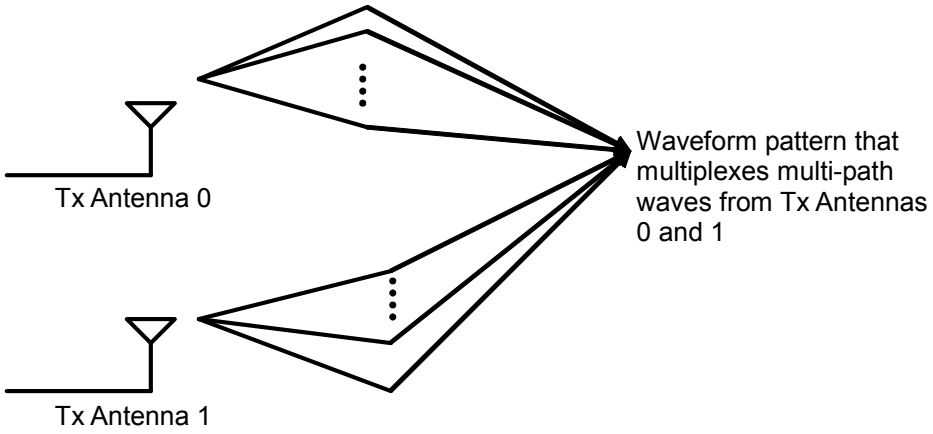


Figure 3.2.5-2 When multi-path processing is enabled (Number of Tx Antennas = 2)

Table 3.2.5-1 shows the number of waveform patterns to be generated, according to settings of Number of Tx Antennas and Multi-Path Setting (multi-path processing enable/disable).

Table 3.2.5-1 Number of waveform patterns to be generated

	Multi-Path Setting	
Number of Tx Antennas	Enable	Disable
1	1	1
2	1	2

3.2.6 Ranging code

Ranging code consists of 144-bit codes, which are generated by the ranging code generator shown in Figure 3.2.6-1. When a ranging code is generated, it is mapped to a subcarrier by BPSK.
A value set by UL-PermBase of a zone, for which Initial/Handover Ranging Region or BW Request/Periodic Ranging Region is set, is applied to bits s0 through s6 of the ranging code generator in Figure 3.2.6-1.

When Ranging Code Number (refer to Sections 3.1.4.26 and/or 3.1.4.27) is set, the ranging code generator performs calculations for the number of times of 144 × (Ranging Code Number – 1), and following this calculation, a 144-bit ranging code is calculated. The generated ranging code is mapped to a subcarrier as the ranging code of the Initial/Handover Ranging Burst or BW Request/Periodic Ranging Burst.

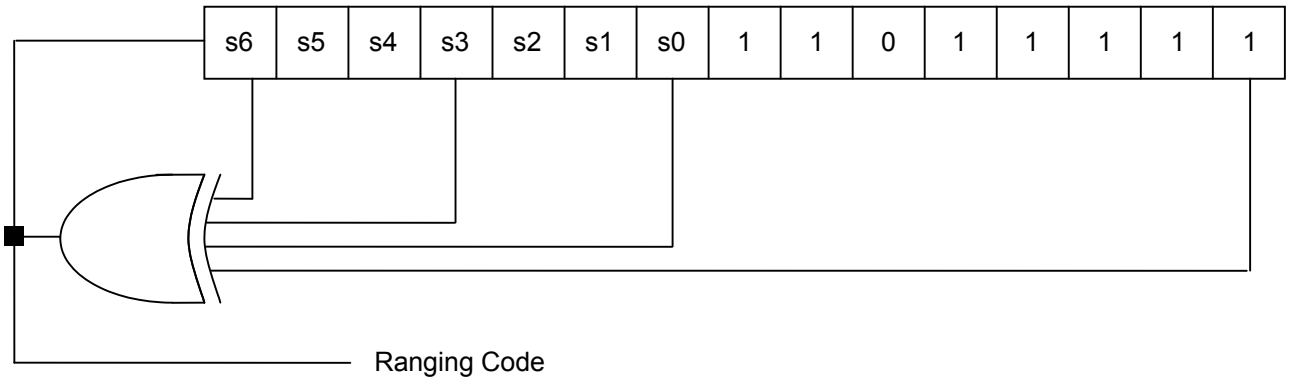


Figure 3.2.6-1 Ranging code generator

3.2.7 Collaborative MIMO

The pilot pattern of the uplink burst can be changed by editing Pilot Pattern in UL-Burst. Uplink waveform patterns that correspond to Collaborative MIMO can be generated in this way.
Figures 3.2.7-1 and 3.2.7-2 show the pilot patterns when Pilot Pattern is edited in UL-Burst.

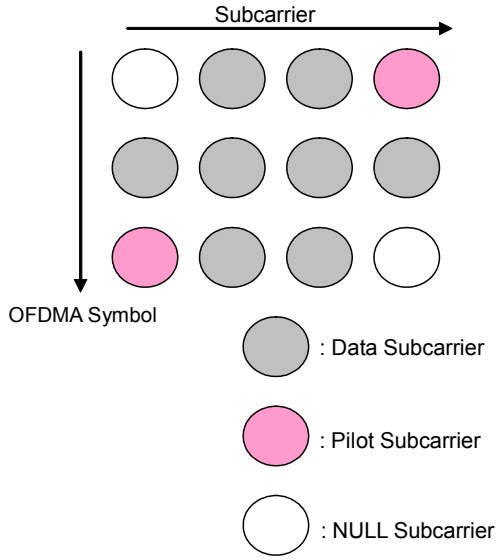


Figure 3.2.7-1 Pilot pattern for Pilot Pattern = PatternA

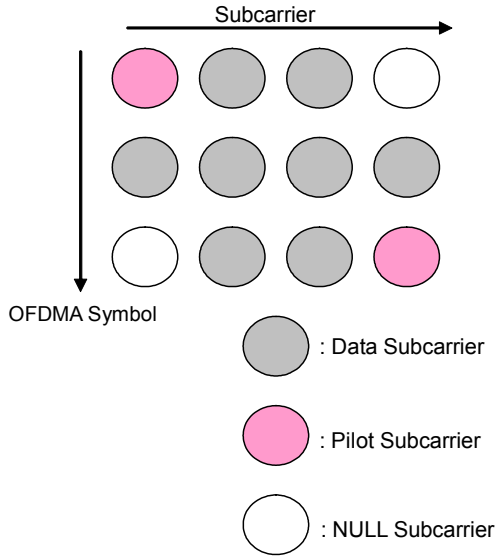


Figure 3.2.7-2 Pilot pattern for Pilot Pattern = PatternB

3.3 Waveform Pattern Generation Procedure

This section provides the waveform pattern generation procedure, taking a waveform pattern with the parameters in Table 3.3-1 below for Downlink: 35 symbols and Uplink: OFDMA 12 symbols, as an example.

Table 3.3-1 Setting of common parameters

Common	
Number of Tx Antennas	1
Number of Frames	1
Initial Frame Number	0
FFT size	1024
G	1/8
Oversampling Ratio	2
Band Width	10.00 MHz
n	28/25
Frame Duration	5.0 ms
Used subchannel Bitmap bits 0 to 5	1
Uplink Allocation Start Time	10376 PS
DL AMC Allocated Physical Bands Bitmap	000000FFFFFF
Segment Index	0
Preamble Index	0
Roll off length	16 samples
Filter	
Filter Type	Non
DLFP	
Repetition Coding Indication	No repetition
Coding Indication	CC

<Procedure for generating Downlink waveform>

The following shows a waveform generation example, where a Downlink waveform with two Zones, PUSC Zone and FUSC Zone, is generated.

1. Start up the Mobile WiMAX IQproducer™.
2. Set the common parameters as shown in Table 3.3-1.
   Note that the Uplink Allocation Start Time and DLFP parameters cannot be edited unless Downlink is displayed. Therefore, set these parameters after Downlink is added in Step 3.

3. If Downlink is not displayed in the tree view, right-click Segment and select “Add Downlink” from the pop-up menu to add Downlink. If Uplink is displayed in the tree view, right-click Uplink and select “Delete Uplink” from the pop-up menu to delete Uplink. Otherwise, select “Toggle Enable” from the pop-up menu and set Data Status for Uplink to “Disable” to disable Uplink (a waveform pattern is generated with Uplink disabled in this procedure).
4. Add preamble, FCH, MAC Message, and DL-MAP if they are not displayed in the tree view. To add a preamble, right-click Downlink and select “Add Preamble” from the pop-up menu. To add an FCH or MAC message, right-click Zone#0 and select “Add FCH” or “Add MAC Message” from the pop-up menu. To add a DL-MAP, right-click a MAC message and select “Add DL-MAP” from the pop-up menu.
5. Set No. OFDMA Symbols of Downlink Zone#0 to 20 by either of the following methods:
   - Change No. OFDMA Symbols in the PHY/MAC parameter list for Zone#0 to 20.
   - Change No. OFDMA Symbols of Downlink Zone#0 in the Segment Edit screen to 20.
6. Adjust the number of DL-Bursts of Downlink Zone#0 to 3 by one of the following methods:
   - Right-click Downlink Zone#0 in the tree view and then select “Add Burst” or “Delete Burst” from the displayed pop-up menu to add/delete DL-Bursts.
   - Set “3” for DL-Burst Number of Downlink Zone#0.
   - Right-click on a Downlink Zone#0 area in the Segment Edit screen, and then select “Add Burst” or “Delete Burst” from the displayed pop-up menu to add/delete DL-Bursts.
7. Allocate three Burst areas of Downlink Zone#0 as shown in Figure 3.3-1 below, so that they do not overlap each other and do not exceed the boundaries of the Zone.
   Tables 3.3-2 through 3.3-5 show sample PHY/MAC parameter settings of the Zone and Burst areas at this time.

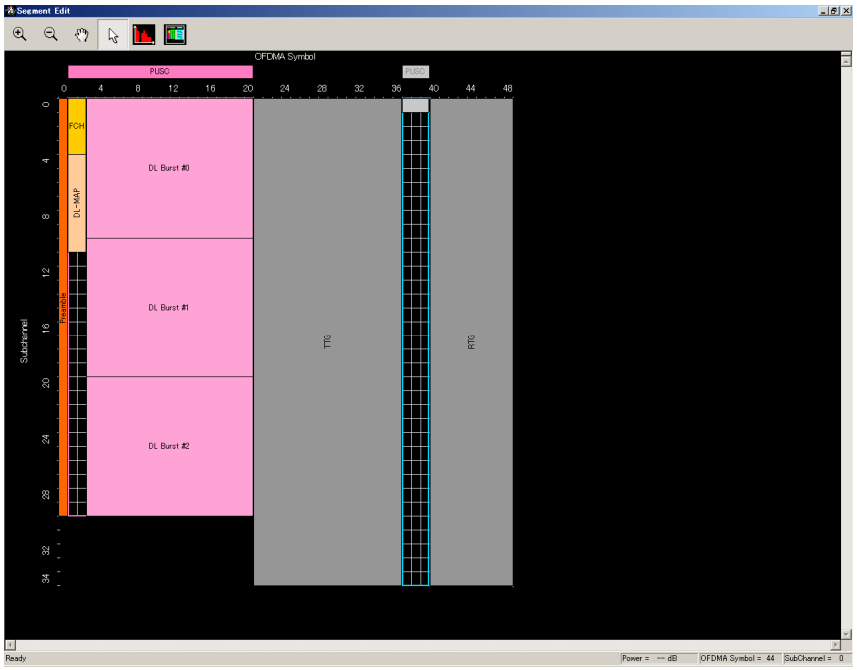


Figure 3.3-1 Segment Edit screen when Downlink Zone#0 is set

Table 3.3-2 PHY/MAC parameter list for Downlink Zone#0

Downlink Zone #0	
Data Status	Enable
Permutation	PUSC
Pilot Position	Hopping
Dedicated Pilot	0
STC/MIMO	No transmit diversity
OFDMA Symbol Offset	1 symbol
No. OFDMA Symbols	20 symbols
DL_PermBase	0
DL-Burst Number	3

Table 3.3-3 PHY/MAC parameter list for Downlink Zone#0 Burst#0

DL-Burst#0	
Data Status	Enable
OFDMA Symbol Offset	3 symbols
OFDMA Subchannel Offset	0
Boosting	0 dB
No. OFDMA Symbols	18 symbols
No. Subchannels	10
Repetition Coding Indication	No repetition
FEC Code Type and Modulation Type	QPSK(CTC)1/2
Inclusion MAP	Normal
DL-Burst Data Type	PN9fix

Table 3.3-4 PHY/MAC parameter list for Downlink Zone#0 Burst#1

DL-Burst#1	
Data Status	Enable
OFDMA Symbol Offset	3 symbols
OFDMA Subchannel Offset	10
Boosting	0 dB
No. OFDMA Symbols	18 symbols
No. Subchannels	10
Repetition Coding Indication	No repetition
FEC Code Type and Modulation Type	16QAM(CTC)1/2
Inclusion MAP	Normal
DL-Burst Data Type	PN9fix

Table 3.3-5 PHY/MAC parameter list for Downlink Zone#0 Burst#2

DL-Burst#2	
Data Status	Enable
OFDMA Symbol Offset	3 symbols
OFDMA Subchannel Offset	20
Boosting	0 dB
No. OFDMA Symbols	18 symbols
No. Subchannels	10
Repetition Coding Indication	No repetition
FEC Code Type and Modulation Type	64QAM(CTC)1/2
Inclusion MAP	Normal
DL-Burst Data Type	PN9fix

8. In the tree view, Downlink Zone can be added by right-clicking Downlink and then selecting “Add Zone” from the displayed pop-up menu. Displayed Zone can be deleted by right-clicking it and then selecting “Delete Zone” from the displayed pop-up menu.
   In this example, add Zone#1 by selecting “Add Zone” from the pop-up menu.
9. Change Permutation of Downlink Zone#1 added in Step 8 to FUSC. Change of Permutation is possible for Downlink Zone#1 and subsequent Zones.
   Also, set No. OFDMA Symbols of Downlink Zone#1 to 14 by either of the following methods:
   - Change No. OFDMA Symbols in the PHY/MAC parameter list for Downlink Zone#1 to 14.
   - Change No. OFDMA Symbols for Downlink Zone#1 in the Segment Edit screen to 14.
10. Adjust the number of Bursts of Downlink Zone#1 to 3 in the same manner of adjustment as described in Step 6.

11. Allocate three Burst areas of Downlink Zone#1 as shown in Figure 3.3-2 below, so that they do not overlap each other and do not exceed the boundaries of the Zone.
    Tables 3.3-6 through 3.3-9 show sample PHY/MAC parameter settings of the Zone and Burst areas at this time.

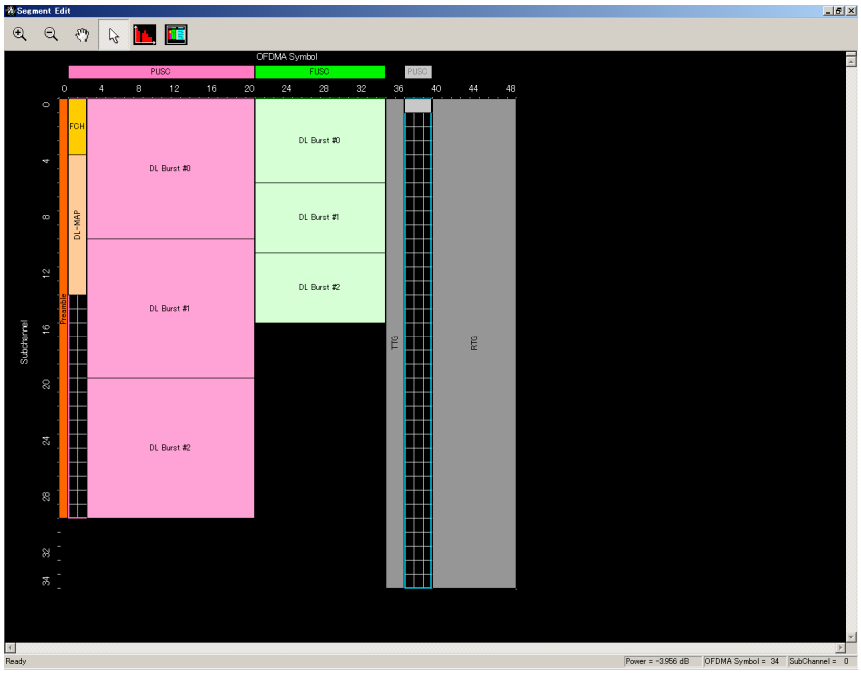


Figure 3.3-2 Segment Edit screen when Downlink Zone#1 is set

Table 3.3-6 PHY/MAC parameter list for Downlink Zone#1

Zone #1	
Data Status	Enable
Permutation	FUSC
Pilot Position	Hopping
Dedicated Pilot	0
OFDMA Symbol Offset	21 symbols
No. OFDMA Symbols	14 symbols
DL_PermBase	0
DL-Burst Number	3
PRBS_ID	0

Table 3.3-7 PHY/MAC parameter list for Downlink Zone#1 Burst#0

DL-Burst#0	
Data Status	Enable
OFDMA Symbol Offset	21 symbols
OFDMA Subchannel Offset	0
Boosting	0 dB
No. OFDMA Symbols	14 symbols
No. Subchannels	6
Repetition Coding Indication	No repetition
FEC Code Type and Modulation Type	QPSK(CTC)1/2
Inclusion MAP	Normal
DL-Burst Data Type	PN9fix

Table 3.3-8 PHY/MAC parameter list for Downlink Zone#1 Burst#1

DL-Burst#1	
Data Status	Enable
OFDMA Symbol Offset	21 symbols
OFDMA Subchannel Offset	6
Boosting	0 dB
No. OFDMA Symbols	14 symbols
No. Subchannels	5
Repetition Coding Indication	No repetition
FEC Code Type and Modulation Type	16QAM(CTC)1/2
Inclusion MAP	Normal
DL-Burst Data Type	PN9fix

Table 3.3-9 PHY/MAC parameter list for Downlink Zone#1 Burst#2

DL-Burst#2	
Data Status	Enable
OFDMA Symbol Offset	21 symbols
OFDMA Subchannel Offset	11
Boosting	0 dB
No. OFDMA Symbols	14 symbols
No. Subchannels	5
Repetition Coding Indication	No repetition
FEC Code Type and Modulation Type	64QAM(CTC)1/2
Inclusion MAP	Normal
DL-Burst Data Type	PN9fix

12. Change the necessary parameter values by selecting the item and editing the values displayed in the list.
13. Click Calculation on the toolbar to generate a waveform pattern after confirming that there is no error displayed.

14. The created waveform pattern can be viewed on an FFT graph. Select **FFT** from the **Simulation** menu, or click the tool button. Figure 3.3-3 shows an FFT graph of the Downlink waveform pattern that is generated with the settings in this example. In Figure 3.3-3, the FFT graph is displayed with FFT Points set to 65536.

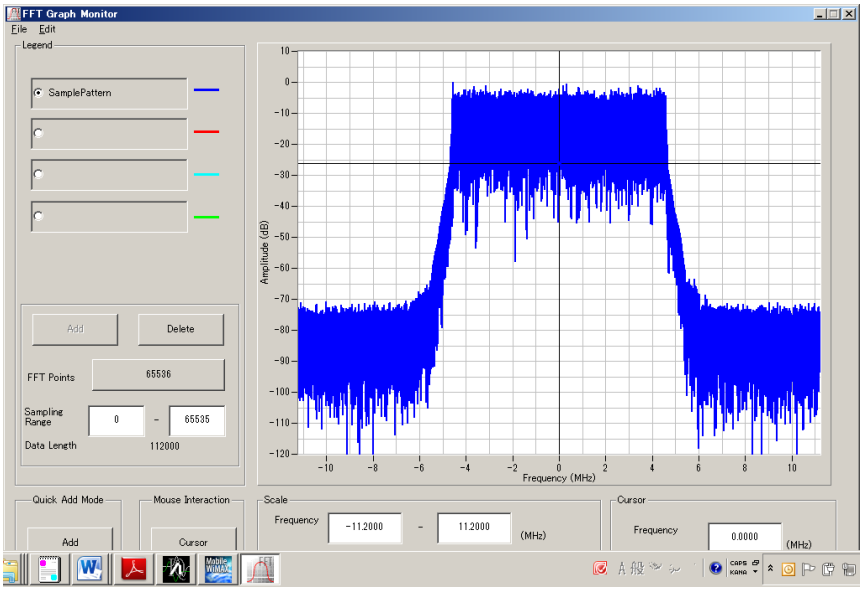


Figure 3.3-3 FFT graph of Downlink waveform

<Procedure for generating Uplink waveform>

The following shows a waveform generation example, where a Uplink waveform with one PUSC Zone is generated.

1. Start up the Mobile WiMAX IQproducer™.
2. Set the common parameters as shown in Table 3.3-1.
   Note that the Uplink Allocation Start Time parameter cannot be edited unless Uplink is displayed. Therefore, set this parameter after Uplink is added in Step 3 below.
   Note also that the DLFP parameter cannot be edited.
3. If Uplink is not displayed in the tree view, right-click Segment and select “Add Uplink” from the pop-up menu to add Uplink. If Downlink is displayed in the tree view, right-click Downlink and select “Delete Downlink” from the pop-up menu to delete Downlink. Otherwise, select “Toggle Enable” from the pop-up menu and set Data Status for Downlink to “Disable” to disable Downlink (a waveform pattern is generated with Downlink disabled in this procedure).

4. Set No. OFDMA Symbols of Uplink Zone#0 to 12 by either of the following methods:
   - Change No. OFDMA Symbols in the PHY/MAC parameter list for Zone#0 to 12.
   - Change No. OFDMA Symbols of Zone#0 in the Segment Edit screen to 12.

   Table 3.3-10 shows sample PHY/MAC parameter settings of Uplink Zone#0 at this time. In this event, when Uplink Zone#0 is set, the UL-Burst Number is 1.

Table 3.3-10 PHY/MAC parameter list for Uplink Zone#0

Uplink Zone #0	
Data Status	Enable
Permutation	PUSC
Pilot Position	Hopping
STC/MIMO	No transmit diversity
OFDMA Symbol Offset	0 symbols
No. OFDMA Symbols	12 symbols
UL_PermBase	0
UL-Burst Number	3

5. Right-click Uplink Zone#0, and select "Add Initial/Handover Ranging Region" from the displayed pop-up menu to add an Initial/ Handover Ranging Region. At this time, set the parameters for the Initial/Handover Ranging Region as shown in Table 3.3-11. Also, set the parameters for the Initial/Handover Ranging Burst#0 and/or the BW Request/Periodic Ranging Burst#0 of the added to the Initial/Handover Ranging Region as shown in Tables 3.3-12 and 3.3-13. Figure 3.3-4 shows the Segment Edit screen when setting of the Initial/Handover Ranging Region is completed.

Table 3.3-11 PHY/MAC parameter list for Initial/Handover Ranging Region

Initial/Handover Ranging Region	
Data Status	Enable
OFDMA Symbol Offset	0 symbols
OFDMA Subchannel Offset	0
No. OFDMA Symbols	3 symbols
No. Subchannels	6
Initial/Handover Ranging Symbols	2 symbols
Initial/Handover Ranging Burst Number	1
Ranging Region Combination	Combine
BW Request/Periodic Ranging Offset	2 symbols
BW Request/Periodic Ranging Symbols	1 symbol
BW Request/Periodic Ranging Burst Number	1

Table 3.3-12 PHY/MAC parameter list for Initial/Handover Ranging Burst#0

Initial/Handover Ranging Burst#0	
Data Status	Enable
OFDMA Symbol Offset	0 symbols
OFDMA Subchannel Offset	0
No. OFDMA Symbols	2 symbols
No. Subchannels	6
Ranging Power Offset	0.00 dB
Ranging Code Number	0

Table 3.3-13 PHY/MAC parameter list for BW Request/Periodic Ranging Burst#0

BW Request/Periodic Ranging Burst#0	
Data Status	Enable
OFDMA Symbol Offset	2 symbols
OFDMA Subchannel Offset	0
No. OFDMA Symbols	1 symbol
No. Subchannels	6
Ranging Power Offset	0.00 dB
Ranging Code Number	0

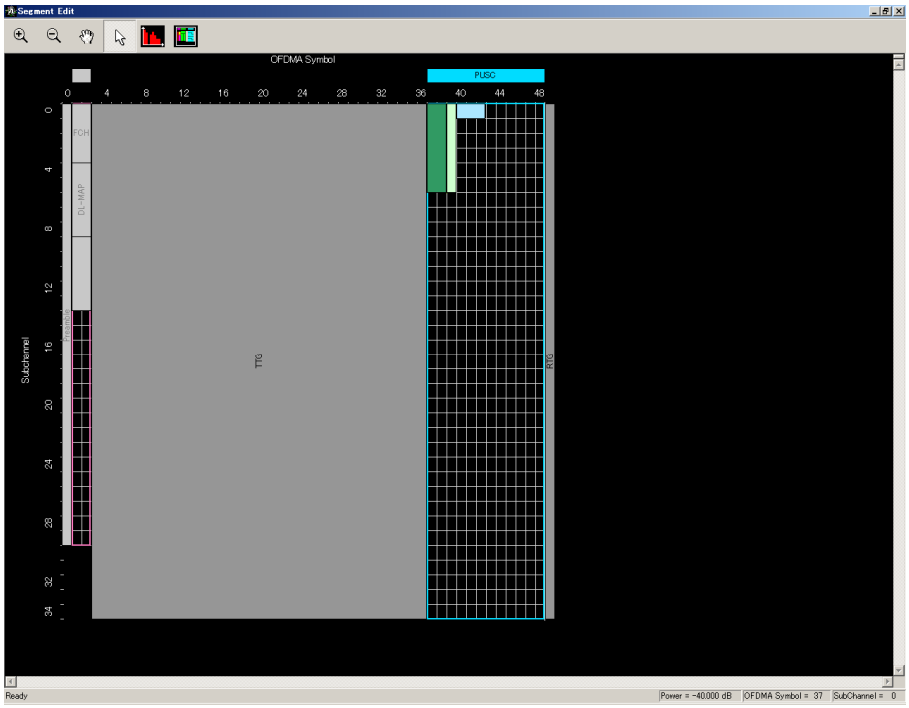


Figure 3.3-4 Segment Edit screen when Initial/Handover Ranging Region is set

6. Right-click Uplink Zone#0, and select "Add Fast-Feedback Region" from the displayed pop-up menu to add a Fast-Feedback Region. At this time, set the parameters for the added Fast-Feedback Region and Fast-Feedback Burst#0 as shown in Tables 3.3-14 and 3.3-15, respectively. Figure 3.3-5 shows the Segment Edit screen when setting of the Fast-Feedback Region is completed.

Table 3.3-14 PHY/MAC parameter list for Fast-Feedback Region

Fast-Feedback Region	
Data Status	Enable
OFDMA Symbol Offset	0 symbols
OFDMA Subchannel Offset	6
No. OFDMA Symbols	3 symbols
No. Subchannels	29
Fast-Feedback Type	6 bits
Fast-Feedback Burst Number	1

Table 3.3-15 PHY/MAC parameter list for Fast-Feedback Burst#0

Fast-Feedback Burst#0	
Data Status	Enable
OFDMA Symbol Offset	0 symbols
OFDMA Subchannel Offset	0
No. OFDMA Symbols	3 symbols
No. Subchannels	1
Feedback Power Offset	0.00 dB
Payload	000000

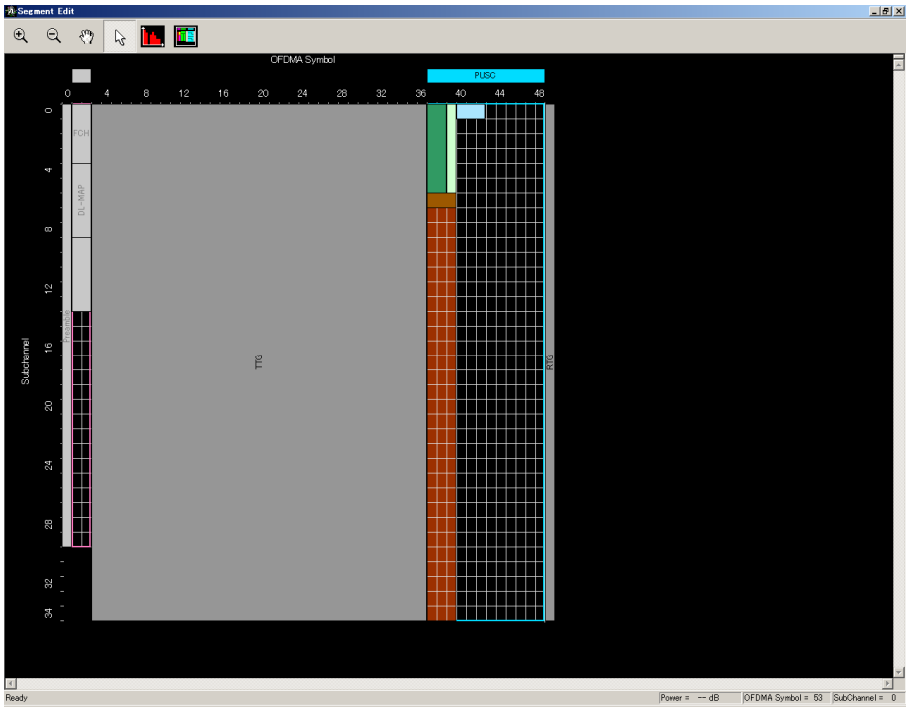


Figure 3.3-5 Segment Edit screen when Fast-Feedback Region is set

7. Adjust the number of DL-Bursts of Uplink Zone#0 to 3 by one of the following methods:
   - Right-click Uplink Zone#0 and then select “Add Burst” or “Delete Burst” from the displayed pop-up menu to add/delete UL-Bursts.
   - Set “3” for UL-Burst Number of Uplink Zone#0.
   - Right-click on an Uplink Zone#0 area in the Segment Edit screen, and then select “Add Burst” or “Delete Burst” from the displayed pop-up menu to add/delete UL-Bursts.
8. Allocate three Burst areas of Uplink Zone#0 as shown in Figure 3.3-6 below, so that they do not exceed the boundaries of the Zone. Tables 3.3-16 through 3.3-18 show sample PHY/MAC parameter settings of the UL-Bursts at this time.

Table 3.3-16 PHY/MAC parameter list for Uplink Zone#0 Burst#0

UL-Burst#0	
Data Status	Enable
OFDMA Symbol Offset	3 symbols
OFDMA Subchannel Offset	0
UL-Burst Duration	93 symbols
Burst Power Offset	0.00 dB
Pilot Pattern	Normal
Repetition Coding Indication	No repetition
FEC Code Type and Modulation Type	QPSK(CTC)1/2
Inclusion MAP	Normal
UL-Burst Data Type	PN9fix

Table 3.3-17 PHY/MAC parameter list for Uplink Zone#0 Burst#1

UL-Burst#1	
Data Status	Enable
OFDMA Symbol Offset	6 symbols
OFDMA Subchannel Offset	10
UL-Burst Duration	120 symbols
Burst Power Offset	0.00 dB
Repetition Coding Indication	No repetition
Pilot Pattern	Normal
FEC Code Type and Modulation Type	16QAM(CTC)1/2
Inclusion MAP	Normal
UL-Burst Data Type	PN9fix

Table 3.3-18 PHY/MAC parameter list for Uplink Zone#0 Burst#2

UL-Burst#2	
Data Status	Enable
OFDMA Symbol Offset	9 symbols
OFDMA Subchannel Offset	23
UL-Burst Duration	102 symbols
Burst Power Offset	0.00 dB
Pilot Pattern	Normal
Repetition Coding Indication	No repetition
FEC Code Type and Modulation Type	64QAM(CTC)1/2
Inclusion MAP	Normal
UL-Burst Data Type	PN9fix

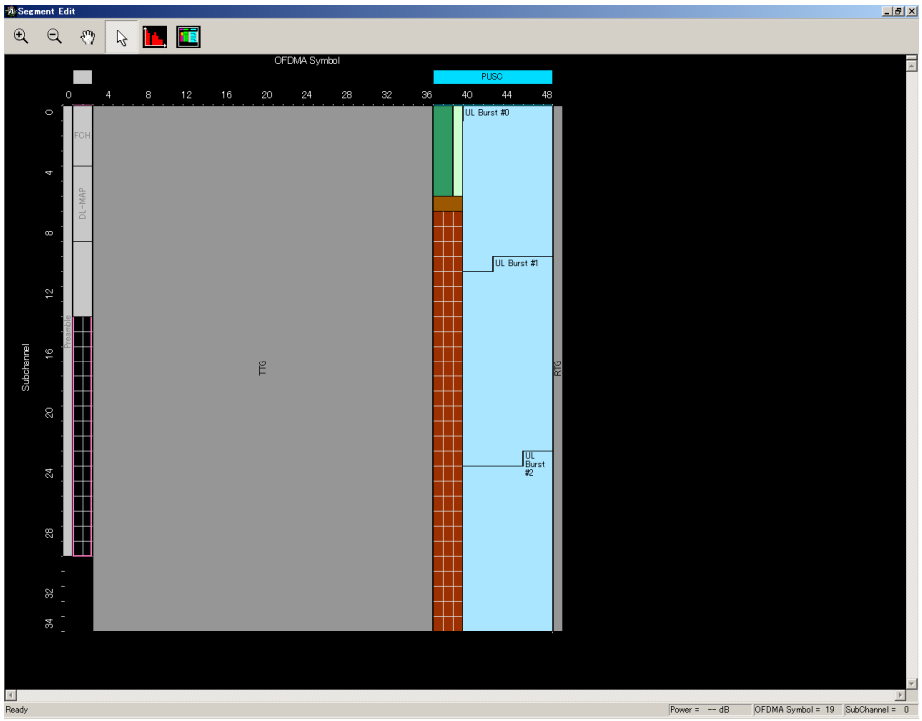


Figure 3.3-6 Segment Edit screen when UL-Burst is set

9. Change the necessary parameter values by selecting the item and editing the values displayed in the list.
10. Click Calculation on the toolbar to generate a waveform pattern after confirming that there is no error displayed.
11. The created waveform pattern can be viewed on the FFT graph. Select "FFT" from the **Simulation** menu, or click the FFT tool button. Figure 3.3-7 shows an FFT graph of the Uplink waveform pattern that is generated with the settings in this example. In Figure 3.3-7, the FFT graph is displayed with FFT Points set to 16384.
    An Uplink waveform is output after the value set by the common parameter Uplink Allocation Start Time. When displaying an Uplink waveform in the FFT graph, it is therefore required to set Sampling Range on the FFT Graph Monitor screen to the value obtained from the following expression:
    Uplink Allocation Start Time × 4 × Oversampling Ratio

    In the case of the waveform pattern generated in this example, since Uplink Allocation Start Time is set to 10376 (PS) and Oversampling Ratio is set to 2, Sampling Range must be set to 83008 to display the Uplink waveform in the FFT graph.

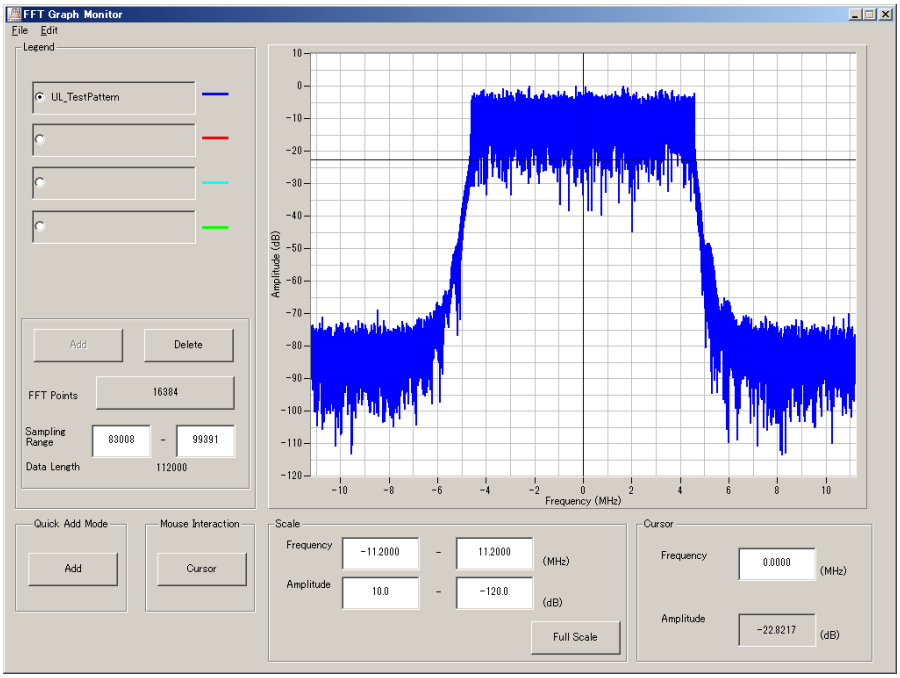


Figure 3.3-7 FFT graph of Uplink waveform

3.4 Saving/Reading Parameters

The numeric values and settings for each item can be saved in a parameter file by using this software.

3.4.1 Saving a parameter file

When running on PC, MS2690A/MS2691A/MS2692A, or MS2830A

1. Select **Save Parameter File** from the **File** menu or click the tool button to display the parameter file saving screen.

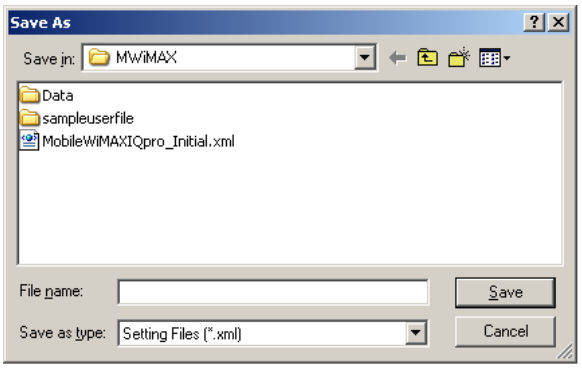


Figure 3.4.1-1 Parameter file saving screen

2. Specify **Save in**, enter a file name in the **File name** text box, and click **Save** to save the parameter file.

When running on MG3710A

1. Click the **Save Parameter File** button in **File** menu or click the button to display the parameter file saving screen.

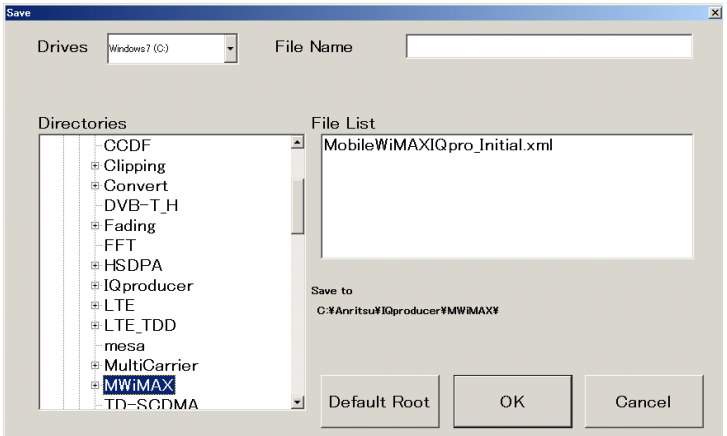


Figure 3.4.1-2 Parameter file saving screen (MG3710A)

2. Select the folder to store the file in the **Directories** field, and then enter the name of the file using the **File Name** box. Click **OK** to save the parameter file. To initialize the setting in the **Directories** field, click the **Default Root** button.

3.4.2 Reading a parameter file

When running on PC, MS2690A/MS2691A/MS2692A, or MS2830A

1. Select **Recall Parameter File** from the **File** menu or click the  tool button to display the parameter file reading screen.

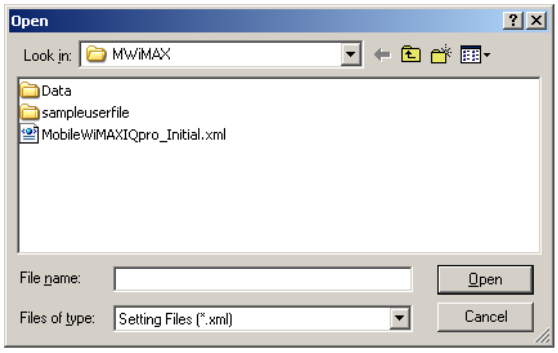


Figure 3.4.2-1 Parameter file reading screen

2. Select a parameter file to be read from the file list, and then click **Open** to read the selected parameter file.

When running on MG3710A

1. Select **Recall Parameter File** from the **File** menu or click the  tool button to display the parameter file reading screen.

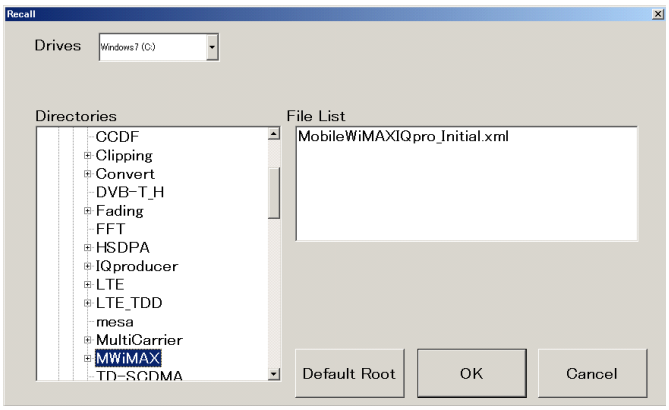


Figure 3.4.2-2 Parameter file reading screen (MG3710A)

2. Select the directory where the files to be loaded is stored in the **Directories** field. Click the desired file from the **File List**, and click **OK**. To initialize the setting in the **Directories** field, click the **Default Root** button.

3.5 User File Reading Screen

When running on PC, MS2690A/MS2691A/MS2692A, or MS2830A

1. When **User File** is selected in each layer, the user file reading screen.

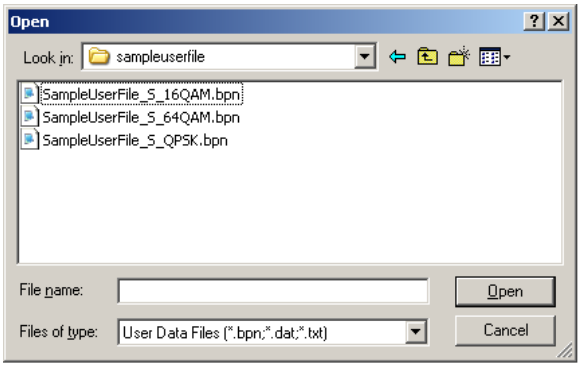


Figure 3.5-1 User file reading screen

2. Select a user file to be read from the file list, and then click **Open** to read the selected user file.

If an unsupported User File is selected, an error is displayed. Refer to Appendix B “User File Format” for details on the user file format.

When running on MG3710A

1. When **User File** is selected for **Data Type** setting in the Channel Setting screen, the user file reading screen is displayed.

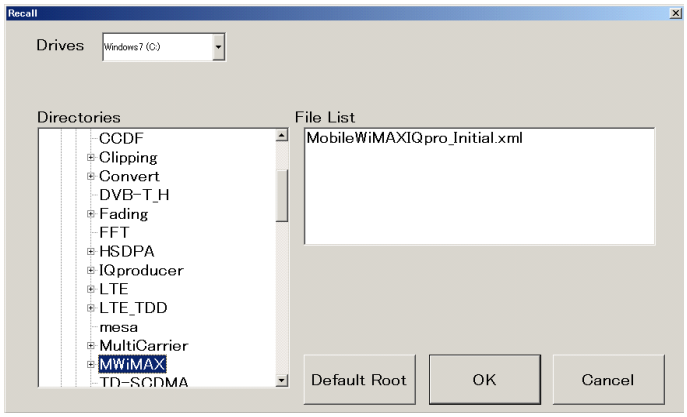


Figure 3.5-2 User file reading screen (MG3710A)

2. Select the directory where the user files to be loaded is stored in the **Directories** field. Click the desired file from the **File List**, and click **OK**. To initialize the setting in the **Directories** field, click the **Default Root** button.

If an unsupported User File is selected, an error is displayed. Refer to Appendix B “User File Format” for details on the user file format.

3.6 Displaying Graph

The generated waveform pattern can be displayed in a CCDF, FFT, or Time Domain graph by using this software. For details of each graph display, refer to each one of the following:

- MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
  4.3 “CCDF Graph Display”, 4.4 “FFT Graph Display”, 4.13 “Time Domain Graph Display”
- MS2690A/MS2691A/MS2692A or MS2830A Vector Signal Generator Operation Manual (IQproducer™)
  4.3 “CCDF Graph Display”, 4.4 “FFT Graph Display”, 4.9 “Time Domain Graph Display”

Displaying the CCDF graph

1. Generate a waveform pattern by executing “Calculation” (refer to Section 3.2 “Waveform Pattern Generation Procedure”).
2. Select **CCDF** from the **Simulation** menu or click the  tool button. The CCDF Graph Monitor screen shown in Figure 3.6-1 is displayed with the trace of the generated waveform pattern.

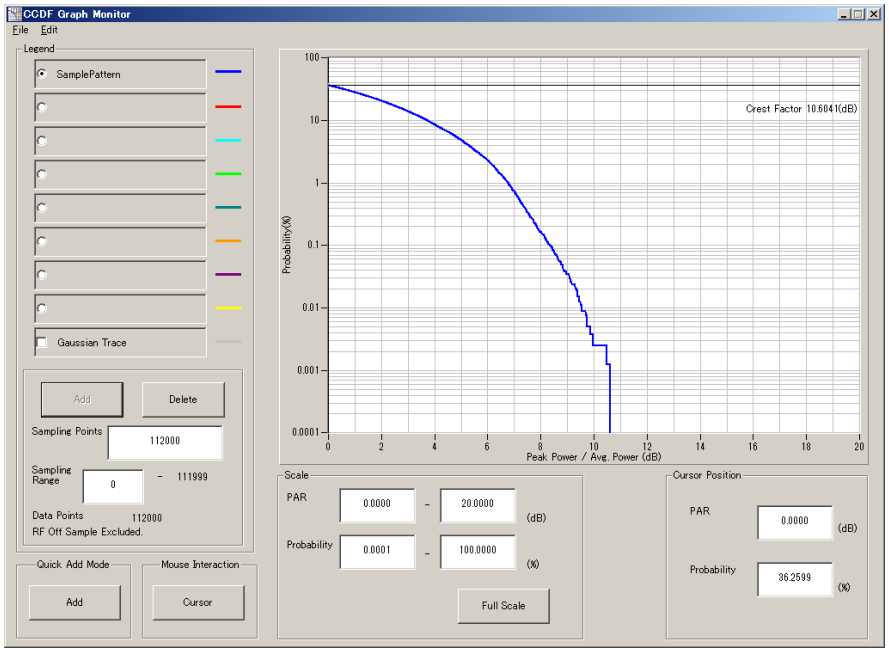


Figure 3.6-1 CCDF Graph Monitor screen

When a waveform pattern is generated by changing parameters and executing “Calculation” while other traces are displayed on the CCDF Graph Monitor screen, the trace of the waveform pattern

newly generated can be displayed with either of the following two methods:

- Displaying the new trace on the same screen as the previous traces
- Deleting the previous traces to display the new trace

> ***Note:***
> A CCDF graph, an FFT graph, and a Time Domain graph cannot be generated at the same time. When displaying all the graphs, execute the graph generation after each graph generation is completed.

■ When displaying a new trace on the same screen with the previous traces:

1. Set **Add** for **Quick Add Mode** on the lower-left of the CCDF Graph Monitor screen.
2. Select **CCDF** from the **Simulation** menu or click the  tool button. The trace of the waveform pattern newly generated is additionally displayed on the CCDF Graph Monitor screen.
   Up to eight traces can be displayed by repeating this procedure.

■ When deleting the previous traces to display a new trace:

1. Set **Clear** for **Quick Add Mode** on the lower-left of the CCDF Graph Monitor screen.
2. Select **CCDF** from the **Simulation** menu or click the  tool button. The confirmation message shown in Figure 3.6-2 below appears:

Figure 3.6-2 Confirmation message

Click **Yes**. The previous traces are deleted from the CCDF Graph Monitor screen, and the trace of the waveform pattern newly generated is displayed.

Displaying the FFT graph

1. Generate a waveform pattern by executing “Calculation”.
2. Select **FFT** from the **Simulation** menu or click the  tool button. The FFT Graph Monitor screen shown in Figure 3.6-3 is displayed with the trace of the generated waveform pattern.

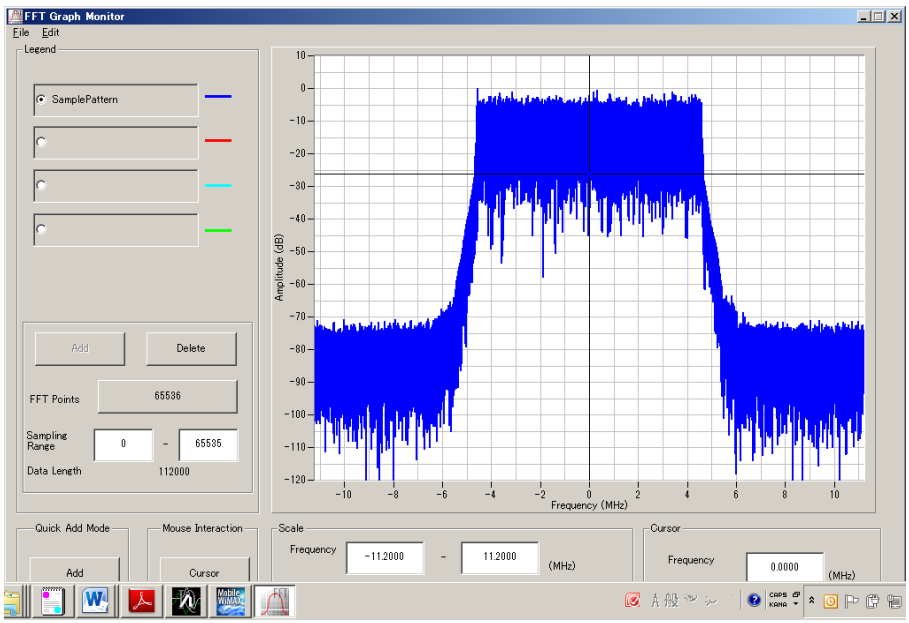


Figure 3.6-3 FFT Graph Monitor screen

When a waveform pattern is generated by changing parameters and executing “Calculation” while other traces are displayed on the FFT Graph Monitor screen, the trace of the waveform pattern newly generated can be displayed with either of the following two methods:

- Displaying the new trace on the same screen as the previous traces
- Deleting the previous traces to display the new trace

Note:

A CCDF graph, an FFT graph, and a Time Domain graph cannot be generated at the same time. When displaying all the graphs, execute the graph generation after each graph generation is completed.

■ When displaying a new trace on the same screen with the previous traces:

1. Set **Add** for **Quick Add Mode** on the lower-left of the FFT Graph Monitor screen.
2. Select **FFT** from the **Simulation** menu or click the  tool button.
   The trace of the waveform pattern newly generated is additionally displayed on the FFT Graph Monitor screen.
   Up to four traces can be displayed by repeating this procedure.

■ When deleting the previous traces to display a new trace:

1. Set **Clear** for **Quick Add Mode** on the lower-left of the FFT Graph Monitor screen.
2. Select **FFT** from the **Simulation** menu or click the  tool button.
   The confirmation message shown in Figure 3.6-4 below appears:

Figure 3.6-4 Confirmation message

Click **Yes**. The previous traces are deleted from the FFT Graph Monitor screen, and the trace of the waveform pattern newly generated is displayed.

Displaying the Time Domain graph

1. Generate a waveform pattern by executing “Calculation”.
2. Select **Time Domain** from the **Simulation** menu or click the tool button. The Time Domain screen shown in Figure 3.6-5 is displayed with the trace of the generated waveform pattern.

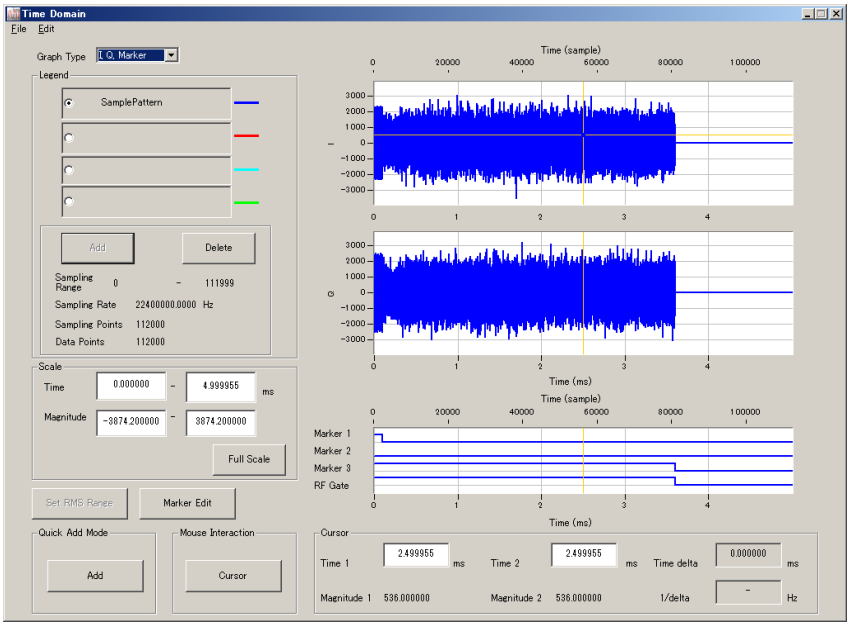


Figure 3.6-5 Time Domain screen

When a waveform pattern is generated by changing parameters and executing “Calculation” while other traces are displayed on the Time Domain screen, the trace of the waveform pattern newly generated can be displayed with either of the following two methods:

- Displaying the new trace on the same screen as the previous traces
- Deleting the previous traces to display the new trace

Note:

A CCDF graph, an FFT graph, and a Time Domain graph cannot be generated at the same time. When displaying all the graphs, execute the graph generation after each graph generation is completed.

■ When displaying a new trace on the same screen with the previous traces:

1. Set **Add** for **Quick Add Mode** on the lower-left of the Time Domain screen.
2. Select **Time Domain** from the **Simulation** menu or click the tool button. The trace of the waveform pattern newly generated is additionally displayed on the Time Domain screen.
   Up to four traces can be displayed by repeating this procedure.

■ When deleting the previous traces to display a new trace:

1. Set **Clear** for **Quick Add Mode** on the lower-left of the Time Domain screen.
2. Select **Time Domain** from the **Simulation** menu or click the tool button. The confirmation message shown in Figure 3.6-6 below appears:

Figure 3.6-6 Confirmation message

Click **Yes**. The previous traces are deleted from the Time Domain Graph Monitor screen, and the trace of the waveform pattern newly generated is displayed.

3.7 Auxiliary Signal Output

When a waveform pattern generated by the Mobile WiMAX IQproducer™ is selected by the Vector Signal Generator, a signal (Frame Pulse/Pattern Sync Marker, Uplink Subframe Clock, or RF Gate) synchronized with the RF signal is output as an auxiliary signal.

- Frame Pulse/ Pattern Sync Marker
  When SG Master/Slave Setting is set to OFF or Slave, a pulse synchronized with the symbol at the beginning of the frame is output.
  When SG Master/Slave Setting is set to ON or Master, a pulse synchronized with the symbol at the beginning of the waveform pattern is output.
  The pulse width is one OFDMA symbol. Change Polarity for Marker 1 to change the signal polarity.
- Uplink Subframe Clock
  A pulse synchronized with the symbol at the beginning of the uplink subframe is output. The pulse width is one OFDMA symbol. Change Polarity for Marker 2 to change the signal polarity.
- RF Gate
  Indicates the RF output burst ON/OFF status of Vector Signal Generator when a burst wave is used as the waveform pattern.
  Correspondence between burst status and output signal status is shown below:
  Burst ON: High level
  Burst OFF: Low level
  When Polarity for Marker 3 is set to Positive. When Polarity is set to Negative, the above correspondences are reversed.

The following connectors output marker signal.

■ MG3700A
Marker signal is output from the rear panel connector(s).

Table 3.7-1 MG3700A Marker Signal

Marker Signal	Connector
Frame Pulse/ Pattern Sync Marker	Connector1
Uplink Subframe Clock	Connector2
RF Gate	Connector3

■ MS2690A/MS2691A/MS2692A/MS2830A
Marker signal is output from the rear panel AUX I/O connector(s).

Table 3.7-2 MS2690A/MS2691A/MS2692A/MS2830A Marker Signal

Marker Signal	Connector
Frame Pulse/ Pattern Sync Marker	Marker1
Uplink Subframe Clock	Marker2
RF Gate	Marker3

■ MG3710A
Marker signal is output from the rear panel connector(s).
Output signal changes according to the MG3710A setting as below.

Table 3.7-3 MG3710A Marker Signal

Marker Signal	Output SG	Waveform memory	Signal name
Frame Pulse/Pattern Sync Marker	SG1	Memory A	SG1 Marker1 A
		Memory B	SG1 Marker1 B
	SG2	Memory A	SG2 Marker1 A
		Memory B	SG2 Marker1 B
Uplink Subframe Clock	SG1	Memory A	SG1 Marker2 A
		Memory B	SG1 Marker2 B
	SG2	Memory A	SG2 Marker2 A
		Memory B	SG2 Marker2 B
RF Gate	SG1	Memory A	SG1 Marker3 A
		Memory B	SG1 Marker3 B
	SG2	Memory A	SG2 Marker3 A
		Memory B	SG2 Marker3 B

For how to configure marker signal and connector, refer to 7.4.2 “Route Output Connectors” in MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe).

Figure 3.7-1 shows the output timing of auxiliary signals for the generated waveform pattern. For the error range of the auxiliary signals against the RF output, refer to Section 4.5.6 “Input file format” in the MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™).

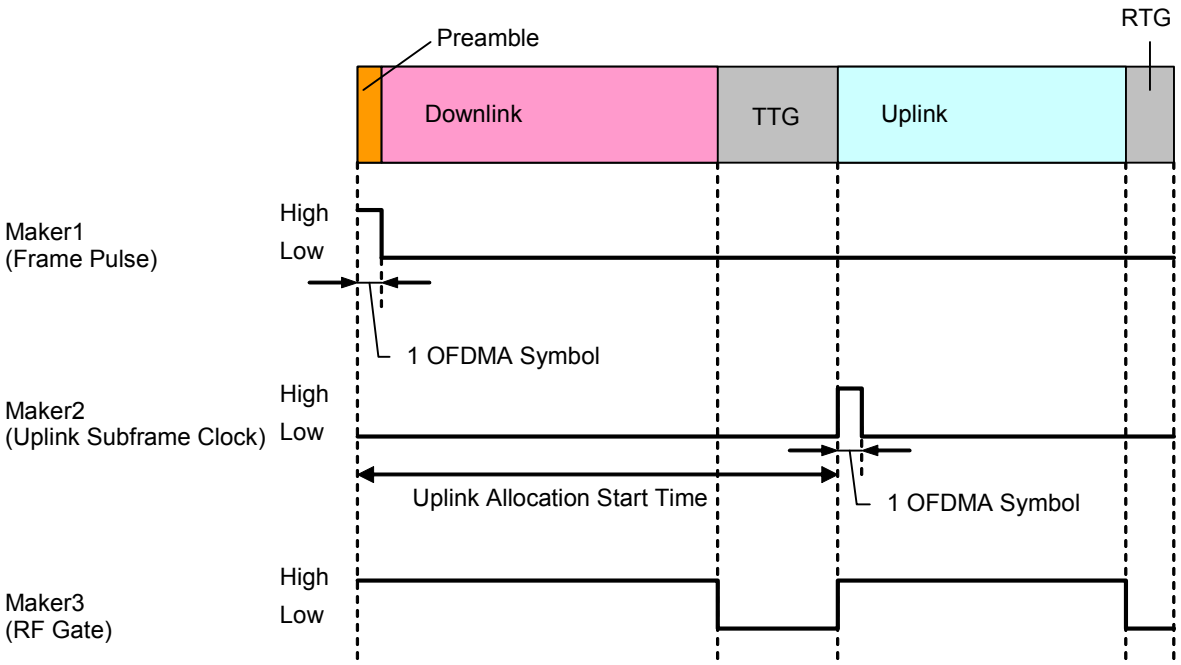


Figure 3.7-1 Auxiliary signal output timing

Chapter 4 How to Use Waveform Patterns

The following operations are required to output a modulated signal from this equipment using the waveform pattern generated by this software:

- Transferring waveform pattern to internal hard disk
- Loading waveform patterns from the hard disk to the waveform memory
- Selecting a waveform pattern to be output from this equipment

This chapter explains the details of these operations.

4.1 For MG3700A or MG3710A

This section describes how to download a waveform pattern created for the MG3700A/MG3710A to the hard disk of the MG3700A/MG3710A and output the pattern.

4.1.1 Transferring waveform pattern to internal hard disk

The waveform pattern created with this software can be transferred to the internal hard disk in the following ways:

Note:

This operation is not necessary if you are using MG3710A and have generated waveform patterns on MG3710A.

For MG3700A

- LAN
- CompactFlash Card

For MG3710A

- LAN
- External device such as USB Memory

■Transferring from PC via LAN (MG3700A, MG3710A)

Two IQproducer™ tools can be used to transfer a waveform pattern to the MG3700A/MG3710A via a LAN.

- Transfer & Setting Wizard
  Start this wizard by clicking the **Transfer & Setting Wizard** button of this software or by selecting **Simulation & Utility** tab → **Transfer & Setting Wizard** from the IQproducer™ after creating a waveform pattern. For details, refer to Section 4.7 "File Transfer and Loading to Memory Using Transfer & Setting Wizard" in the *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*.
  Transferring a waveform pattern to the internal hard disk of the MG3700A/MG3710A, loading the waveform from the hard disk to the waveform memory, and then outputting the waveform pattern can be done using this wizard.

- Transfer & Setting Panel
  This function is loaded by selecting **Transfer & Setting Panel** in the **Simulation & Utility** tab of the IQproducer™. For details, refer to Section 5.2 "Transferring Waveform Pattern" in the *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual IQproducer™*.
  Specify the folder that contains the waveform pattern to transfer to the MG3700A/MG3710A in the PC-side tree of **Transfer & Setting Panel**.

■Transferring using a CF card (MG3700A)

Copy the waveform pattern (***.wvi and ***.wvd files) to be downloaded to the MG3700A to the root directory of a CF card.

Insert the CF card into the card slot on the front panel of the MG3700A, and then copy the file to the hard disk. For details about how to use a CF card to transfer a waveform pattern, refer to (1) Loading waveform file in memory in Section 3.5.2 of the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*.

■Transferring via external device such as USB memory (MG3710A)

For details about how to transfer a waveform pattern created using this software to the hard disk of the MG3710A, refer to Section 7.3.6 "Copying external waveform pattern: Copy" in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*.

4.1.2 Loading to Waveform Memory

To output a modulated signal using a waveform pattern, it is necessary to load the waveform pattern that was transferred to the internal hard disk of the MG3700A/MG3710A (described in Section 4.1.1 "Transferring waveform pattern to internal hard disk") to the waveform memory. A waveform pattern can be loaded into the waveform memory in the following two ways.

■Configuring using the mainframe

A waveform pattern can be loaded into the waveform memory by using the instruction panel of the MG3700A/MG3710A or by using a remote command.

For operation using the front panel, refer below:

- Section 3.5.2 (1) "Loading waveform file in memory" in the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*
- Section 7.3.4 "Loading waveform pattern: Load" in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*

For operation using remote commands, refer below:

- Chapter 4 "Remote Control" in the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*
- Section 7.3.4 "Loading waveform pattern: Load" in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*

■Using Transfer & Setting Panel of IQproducer™

A waveform pattern can be loaded from the LAN-connected PC to the memory by using **Transfer & Setting Panel**, which can be opened from the **Simulation & Utility** tab. For details, refer to Section 4.6 "File Transfer and Loading to Memory Using Transfer & Setting Panel" in the *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*.

4.1.3 Selecting Waveform Pattern

Select a waveform pattern to use for modulation from the waveform patterns loaded into the waveform memory of the MG3700A/MG3710A according to Section 4.1.2 “Loading to waveform memory”. A waveform pattern can be selected in the following two ways.

■Configuring using the MG3700A/MG3710A

Waveform patterns to be used for modulation can be selected by operating the equipment panel or by using a remote command.

For operation using the front panel, refer below:

- Section 3.5.2 (4) “Outputting pattern loaded in Memory A for modulation in Edit mode” in the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*
- Section 7.3.5 “Selecting output waveform pattern: Select” in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*

For operation using remote commands, refer below:

- Chapter 4 “Remote Control” in the *MG3700A Vector Signal Generator Operation Manual (Mainframe)*
- Section 7.3.5 “Selecting output waveform pattern: Select” in the *MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)*

■Using Transfer & Setting Panel of IQproducer™

A waveform pattern can be loaded from the LAN-connected PC to the memory, and also selected for modulation. This is done by using **Transfer & Setting Panel**, which can be opened from the **Simulation & Utility** tab. For details, refer to Section 4.6 “File Transfer and Loading to Memory Using Transfer & Setting Panel” in the *MG3700A/MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*.

4.2 For MS2690A/MS2691A/MS2692A or MS2830A

This section describes how to download a waveform pattern created for the MS2690A/MS2691A/MS2692A or MS2830A to the hard disk of the MS2690A/MS2691A/MS2692A or MS2830A and output the pattern.

4.2.1 Transferring waveform pattern to internal hard disk

For details about how to transfer a waveform pattern created using this software to the hard disk of the MS2690A/MS2691A/MS2692A or MS2830A, refer below:

- Section 2.4.4 "Copying waveform file(s) to hard disk" in the *MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Operation)*
- Section 2.4.4 "Copying waveform file(s) to hard disk" in the *MS2830A Signal Analyzer Vector Signal Generator Operation Manual (Operation)*

Note:

Transferring waveform patterns is not required if the patterns are created using this software.

4.2.2 Loading to Waveform Memory

In order to output a modulated signal using the waveform pattern, it is necessary to load the waveform patterns stored in the internal hard disk to the waveform memory.

■Loading to Waveform Memory

Waveform patterns can be loaded to waveform memories by operating the panel or by using a remote command.

For operation using the front panel, refer below:

- Section 2.4.1 "Loading waveform file in memory" in the *MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Operation)*
- Section 2.4.1 "Loading waveform pattern(s) to memory" in the *MS2830A Signal Analyzer Vector Signal Generator Operation Manual (Operation)*

For operation using remote commands, refer below:

- MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Remote Control)
- MS2830A Signal Analyzer Vector Signal Generator Operation Manual (Remote Control)

4.2.3 Selecting Waveform Pattern

Select waveform patterns to be used for modulation from those loaded in the waveform memory as described in Section 4.2.1 "Transferring waveform pattern to internal hard disk" above.

■Selecting waveform pattern

Waveform patterns to be used for modulation can be selected by operating the equipment panel or by using a remote command.

For operation using the front panel, refer below:

- Section 2.4.2 "Loading waveform file in memory" in the *MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Operation)*
- Section 2.4.2 "Loading waveform pattern(s) to memory" in the *MS2830A Signal Analyzer Vector Signal Generator Operation Manual (Operation)*

For operation using remote commands, refer below:

- MS2690A/MS2691A/MS2692A Signal Analyzer Option 020: Vector Signal Generator Operation Manual (Remote Control)
- MS2830A Signal Analyzer Vector Signal Generator Operation Manual (Remote Control)

Appendix

Appendix A Error Messages

A list of error messages is shown below. In this list, n_1 and n_2 indicate a numeric value, and s indicates a character string.

Table A-1 Error messages

Error Message	Description
Cannot open file.	The file cannot be opened.
Cannot open file ("s").	The file s cannot be opened.
Cannot read file.	The file cannot be read.
Cannot write file.	Data cannot be written to the file. (This message also appears when there is not enough free hard disk space.)
The setting value is out of range. (s (n_1–n_2))	The value of parameter s is out of the setting range between n_1 and n_2.
Invalid file format.	The file format is invalid.
Invalid file format. (s)	The format of file s is invalid.
The Waveform data file is not generated.	No waveform pattern data is generated.
DL zone is beyond the boundary of the DL-subframe. (Downlink , Zone # n_1)	Downlink Zone#n_1 is allocated beyond the downlink subframe boundary.
Some downlink zones are overlapping. (Downlink , Zone # n_1)	Downlink Zone#n_1 is allocated overlapping another downlink zone.
Some bursts are beyond the boundary of the permutation zone. (Downlink , Zone # n_1 , DL-Burst # n_2)	Burst#n_2 that belongs to Downlink Zone#n_1 is allocated beyond the Zone boundary.
Some bursts are beyond the boundary of the permutation zone. (Downlink , Zone # n_1 , MAP-Burst # n_2)	MAP-Burst#n_2 that belongs to Downlink Zone#n_1 is allocated beyond the Zone boundary.
Some downlink bursts are overlapping. (Downlink , Zone # n_1 , DL-Burst # n_2)	Burst#n_2 that belongs to Downlink Zone#n_1 is allocated overlapping another downlink zone.
Some downlink bursts are overlapping. (Downlink , Zone # n_1 , MAP-Burst # n_2)	MAP-Burst#n_2 that belongs to Downlink Zone#n_1 is allocated overlapping another downlink zone.
Data size is too large for the burst. (Downlink , Zone # n_1 , DL-Burst # n_2)	The total size of the MAC PDUs of Burst#n_2 that belongs to Downlink Zone#n_1 is greater than the size assigned to Burst.
Data size is too large for the burst. (Downlink , Zone # n_1 , MAP-Burst # n_2)	The total size of the MAC PDUs of MAP-Burst#n_2 that belongs to Downlink Zone#n_1 is greater than the size assigned to MAP-Burst.
The number of allocated slots is not a multiple of repetition factor. (Downlink , Zone # n_1 , DL-Burst # n_2)	The number of slots assigned to Burst#n_2 that belongs to Downlink Zone#n_1 is not an integral multiple of Repetition Coding Indication set for Burst#n_2.
The number of allocated slots is not a multiple of repetition factor. (Downlink , Zone # n_1 , MAP-Burst # n_2)	The number of slots assigned to MAP-Burst#n_2 that belongs to Downlink Zone#n_1 is not an integral multiple of Repetition Coding Indication set for MAP-Burst#n_2.
SUB-DL-UL-MAP is allocated beyond the boundary of the permutation zone. (SUB-DL-UL-MAP # n_1)	SUB-DL-UL-MAP#n_1 is allocated beyond the Zone boundary.
Some downlink bursts are overlapping. (Downlink , Zone # n_1 , DL-HARQ Burst # n_2)	DL-HARQ Burst#n_2 that belongs to Downlink Zone#n_1 is allocated overlapping another Burst.

Table A-1 Error messages (Cont'd)

Error Message	Description
Some bursts are allocated beyond the boundary of the permutation zone. (Downlink , Zone # n_1 , DL-HARQ Burst # n_2)	DL-HARQ Burst#n_2 that belongs to Downlink Zone#n_1 is allocated beyond the Zone boundary.
Data size is too large for the burst. (Downlink , Zone # n_1 , DL-HARQ Burst # n_2 , Sub-Burst# n_3)	The total size of the MAC PDUs of Sub-Burst#n_3 of DL-HARQ Burst#n_2 that belongs to Downlink Zone#n_1 is greater than the size assigned to Burst.
The number of allocated slots is not a multiple of the repetition factor. (Downlink , Zone # n_1 , DL-HARQ Burst # n_2 , Sub-Burst# n_3)	The number of slots assigned to Sub-Burst#n_3 of DL-HARQ Burst#n_2 that belongs to Downlink Zone#n_1 is not an integral multiple of Repetition Coding Indication set for Sub-Burst.
UL zone is allocated beyond the boundary of the UL-subframe. (Uplink , Zone # n_1)	Uplink Zone#n_1 is allocated beyond the uplink subframe boundary.
Some bursts are allocated beyond the boundary of the zone. (Uplink , Zone # n_1 , UL-Burst # n_2)	UL-Burst#n_2 that belongs to Uplink Zone#n_1 is allocated beyond the Zone boundary.
Some uplink zones are overlapping. (Uplink , Zone # n_1)	Uplink Zone#n_1 is allocated overlapping another uplink zone.
Some uplink bursts are overlapping. (Uplink, Zone # n_1 , UL-Burst # n_2)	Burst#n_2 belonging to Uplink Zone#n_1 is allocated overlapping another uplink zone.
Data size is too large for the burst. (Uplink , Zone # n_1 , UL-Burst # n_2)	The total size of the MAC PDUs of Burst#n_2 that belongs to Uplink Zone#n_1 is greater than the size assigned to Burst.
The number of allocated slots is not a multiple of repetition factor. (Uplink , Zone # n_1 , UL-Burst # n_2)	The number of slots assigned to Burst#n_2 that belongs to Uplink Zone#n_1 is not an integral multiple of Repetition Coding Indication set for Burst#n_2.
Some uplink bursts are overlapping. (Uplink, Zone # n_1 , UL-HARQ Burst # n_2)	UL-HARQ Burst#n_2 that belongs to Uplink Zone#n_1 is allocated overlapping another Burst.
Some bursts are allocated beyond the boundary of the zone. (Uplink , Zone # n_1 , UL-HARQ Burst # n_2)	UL-HARQ Burst#n_2 that belongs to Uplink Zone#n_1 is allocated beyond the Zone boundary.
Data size is too large for the burst. (Uplink , Zone # n_1 , UL-HARQ Burst # n_2 , Sub-Burst# n_3)	The total size of the MAC PDUs of Sub-Burst#n_3 of UL-HARQ Burst#n_2 that belongs to Uplink Zone#$n1$ is greater than the size assigned to Burst.
The number of allocated slots is not a multiple of the repetition factor. (Uplink , Zone # n_1 , UL-HARQ Burst # n_2 , Sub-Burst# n_3)	The number of slots assigned to Sub-Burst#n_3 of UL-HARQ Burst#n_2 that belongs to Uplink Zone#n_1 is not an integral multiple of Repetition Coding Indication set for Sub-Burst.
DL-MAP length is not a multiple of repetition factor.	The DL-MAP length is not an integral multiple of Repetition Coding Indication set for DL-MAP.
DCD Length is too large. (DCD)	The DCD length is greater than the size that can be assigned to MAC PDU.
UCD Length is too large. (UCD)	The UCD length is greater than the size that can be assigned to MAC PDU.
Some Initial/Handover Ranging Bursts are beyond the boundary of the Ranging Region.	An Initial/Handover Ranging Burst is allocated beyond the Ranging Region boundary.

Table A-1 Error messages (Cont'd)

Error Message	Description
Some BW Request/Periodic Ranging Bursts are allocated beyond the boundary of the Ranging Region.	A BW Request/Periodic Ranging Burst is allocated beyond the Ranging Region boundary.
Ranging Bursts are overlapping.	A Ranging Burst is allocated overlapping another Ranging Burst.
Fast-Feedback Bursts are allocated beyond the boundary of the Ranging Region.	A Fast-Feedback Burst is allocated beyond the Fast-Feedback Region boundary.
Fast-Feedback Bursts are overlapping.	A Fast-Feedback Burst is allocated overlapping another Fast-Feedback Burst.
Initial/Handover Ranging Region is allocated beyond the boundary of the UL-Zone.	The Initial/Handover Ranging Region is allocated beyond the UL-Zone boundary.
BW Request/Periodic Ranging Region is allocated beyond the boundary of the UL-Zone.	The BW Request/Periodic Ranging Region is allocated beyond the Zone boundary.
Fast-Feedback Region is allocated beyond the boundary of the UL-Zone.	The Fast-Feedback Region is allocated beyond the UL-Zone boundary.
UL-ACK Region is allocated beyond the boundary of the UL-Zone.	The UL-ACK Region is allocated beyond the UL-Zone boundary.
Some UL-ACK Bursts are allocated beyond the boundary of the UL-ACK Region.	A UL-ACK Burst is allocated beyond the UL-ACK Region boundary .
UL-ACK Bursts are overlapping.	UL-ACK Bursts are overlapping.
The specified cyclic time shift index is already used by another CID.	The specified cyclic time shift index is already used by another CID.
The specified decimation offset is already used by another CID.	The specified decimation offset is already used by another CID.
Calculation cannot start due to a setting error.	Calculation cannot be started because an error occurs.
An invalid calculation parameter is set.	An incorrect calculation parameter is set.
Calculation cannot start because all items are disable.	Calculation cannot start since all items are disabled.
DL-MAP Length exceeds 255 slots.	DL-MAP Length exceeds 255 slots.
UL-MAP Length exceeds 2037 bytes.	UL-MAP Length exceeds 2037 bytes.

A list of warning messages is shown below.

Table A-2 Warning messages

Warning Message	Description
Number of Frames was set to n_1.	Number of Frames will be set ton_1.
Continuous OFDMA Symbols was set to n_1.	Continuous OFDMA Symbols will be set to n_1.
Uplink Allocation Start Time was set to "n_1".	Uplink Allocation Start Time will be set to n_1.
This operation makes Used subchannel Bitmap (bit 1, bit 3 and bit 5) set to 0.	bit1, bit3, and bit5 of Used subchannel Bitmap will be set to 0.
Input Package Name.	Input a package name.
Input Export File Name.	Input an export file name.
Clipping was done.	The clipping has been completed.
Memory option cannot be turned on in MS269x mode.	The memory option is not available for the IQproducer™ for MS269x.
FEC Type not assigned to DIUC is used.	An FEC Type not assigned to DIUC is used.
FEC Type not assigned to UIUC is used.	An FEC Type not assigned to UIUC is used.
When the UL-ACK Region is added in Zone, Permutation cannot be set for other than PUSC and PUSC(w/o SC rotation).	When the UL-ACK Region is added in Zone, Permutation cannot be set for other than PUSC and PUSC (w/o SC rotation).
When Ranging Region exists, "FFT size" cannot be set to 128.	FFT size cannot be set to 128 with Ranging Region set.
The amount of boosting exceeds 9 dB minus the amount of zone boosting. (Downlink , Zone # n_1 , DL-Burst # n_2)	The amount of boosting at Burst#n_2 that belongs to Downlink Zone#n_1 exceeds 9 dB minus the amount of zone boosting.
The amount of boosting exceeds 9 dB minus the amount of zone boosting. (Downlink , Zone # n_1 , DL-HARQ Burst # n_2)	The amount of boosting at DL-HARQ Burst#n_2 that belongs to Downlink Zone#n_1 exceeds 9 dB minus the amount of zone boosting.

Appendix B User File Format

This section shows an example of the format of user files that can be used in this software. A user file must be a text file. It is not necessarily required to specify an extension to user files. Note that an error occurs if a user file that does not conform to the format is read.

Be sure to describe an unmodulated decimal sequence into a user file. An error occurs if a user file that contains characters other than 0, 1, line feed, comma, period, and space is read. All line feeds, commas, periods, and spaces in a user file are ignored when the user file is read.
A user file format example is shown below.

User file format example (PN9)

```
11111111100000111101111100010111001100100000100101001110110100
11110011111001101100010101001000111000110110101011100010011000
10001000000001000010001100001001110010101011000011011110100110
11100100010100001010110100111111011001001001011011111100100110
10100110011000000011000110010100011010010111111101000101100011
10101100101100111100011111011101000001101011011011101100000101
10101111101010101000000101001010111100101110111000000111001110
10010011110101110101000100100001100111000010111101101100110100
00111011110000
```

0s and 1s in a user file are sequentially read from the leftmost of the first line.

Sample user files are provided in the following directory:
X:\IQproducer\MWiMAX\SampleUserFile
("X:\IQproducer" indicates the folder where the IQproducer™ is installed.)

The following hexadecimal data are written in each sample user file, in a binary sequence.

- SampleUserFile_S_QPSK.bpn
  S_{QPSK} = [0xE4, 0xB1, 0xE1, 0xB4]

- SampleUserFile_S_16QAM.bpn
  S_{16QAM} = [0xA8, 0x20, 0xB9, 0x31, 0xEC, 0x64, 0xFD, 0x75]

- SampleUserFile_S_64QAM.bpn
  S_{64QAM} = [0xB6, 0x93, 0x49, 0xB2, 0x83, 0x08, 0x96, 0x11, 0x41, 0x92, 0x01, 0x00,0xBA, 0xA3, 0x8A, 0x9A, 0x21, 0x82, 0xD7, 0x15, 0x51, 0xD3, 0x05, 0x10, 0xDB, 0x25, 0x92, 0xF7, 0x97, 0x59, 0xF3, 0x87, 0x18, 0xBE, 0xB3, 0xCB, 0x9E, 0x31, 0xC3, 0xDF, 0x35, 0xD3, 0xFB, 0xA7, 0x9A, 0xFF, 0xB7, 0xDB]

Appendix C Correspondence between Items on Tree View and Menu Items

This appendix provides the table that shows the items displayed in the tree view (see Section 3.1.2 "Tree view") and the menu items that are displayed by right-clicking the corresponding item in the tree view.

Table C-1 Correspondence between items on tree view and available menu items

Items in Tree View	Available Menu Items	Restrictions
Segment	Toggle Enable	Enables and disables the multi-path processing function.
	Add Downlink	Enabled when there is no Downlink in the tree view, and the common parameter Frame Duration is not set to Continuous.
	Add Uplink	Enabled when there is no Uplink in the tree view, and the common parameter Frame Duration is not set to Continuous.
Downlink	Toggle Enable	Enables and disables the Downlink.
	Delete Downlink	
	Add Preamble	Enabled when there is no Preamble in the tree view.
	Add Zone	Up to eight Zones can be added.
Uplink	Toggle Enable	Enables and disables the Uplink.
	Delete Uplink	
	Add Zone	Up to eight Zones can be added.
	Add Sounding Zone	Enabled when there is no Sounding Zone in the tree view.
Preamble	Toggle Enable	Enables and disables the Preamble.
	Delete Preamble	
Zone#0 (Downlink)	Toggle Enable	Enables and disables the Downlink Zone#0.
	Add FCH	Enabled when there is no FCH in the tree view.
	Add MAC Message	Enabled when there is no MAC Message in the tree view.
	Add Burst	Up to sixteen Bursts can be added.
	Add MAP-Burst	Up to three MAP-Bursts can be added.
	Add DL-HARQ Burst	Up to sixteen DL-HARQ Bursts can be added.
	Copy Zone	Disabled when eight Zones are already set.

Table C-1 Correspondence between items on tree view and available menu items (Cont'd)

Items in Tree View	Available Menu Items	Restrictions
Zone#0 (Uplink)	Toggle Enable	Enables and disables the Uplink Zone#0.
	Add Burst	Up to sixteen Bursts can be added.
	Add UL-HARQ Burst	Up to sixteen UL-HARQ Bursts can be added.
	Add Initial/Handover Ranging Region	Enabled when there is no Initial/Handover Ranging Region in the tree view. Disabled when FFT size is set to 128.
	Add BW Request/ Periodic Ranging Region	Enabled when there is no BW Request/ Periodic Ranging Region in the tree view, and the Initial/Handover Ranging Region parameter Ranging Region Combination is set to Non. Disabled when FFT size is set to 128.
	Add Fast-Feedback Region	Enabled when there is no Add Fast-Feedback Region in the tree view. Select the Zone set by PUSC or PUSC (w/o SC rotation). Disabled when FFT size is set to 128.
	Add UL-ACK Region	Enabled when there is no UL-ACK Region in the tree view. Select the Zone set by PUSC or PUSC (w/o SC rotation).
	Copy Zone	Disabled when eight Zones are already set.
Zones#1 to #7 (Downlink)	Toggle Enable	Enables and disables the selected Downlink Zone.
	Add Burst	Up to sixteen Bursts can be added.
	Add MAP-Burst	Up to three MAP-Bursts can be added.
	Add DL-HARQ Burst	Up to sixteen DL-HARQ Bursts can be added.
	Copy Zone	Disabled when eight Zones are already set.
	Delete Zone	

Table C-1 Correspondence between items on tree view and available menu items (Cont'd)

Items in Tree View	Available Menu Items	Restrictions
Zones#1 to #7 (Uplink)	Toggle Enable	Enables and disables the selected Uplink Zone.
	Add Burst	Up to sixteen Bursts can be added.
	Add UL-HARQ Burst	Up to sixteen UL-HARQ Bursts can be added.
	Add Initial/Handover Ranging Region	Enabled when there is no Initial/ Handover Ranging Region in the tree view. Disabled when FFT size is set to 128.
	Add BW Request/ Periodic Ranging Region	Enabled when there is no BW Request/ Periodic Ranging Region in the tree view, and the Initial/Handover Ranging Region parameter Ranging Region Combination is set to Non. Disabled when FFT size is set to 128.
	Add Fast-Feedback Region	Enabled when there is no Add Fast-Feedback Region in the tree view. Select the Zone set by PUSC or PUSC (w/o SC rotation). Disabled when FFT size is set to 128.
	Add UL-ACK Region	Enabled when there is no UL-ACK Region in the tree view. Select the Zone set by PUSC or PUSC (w/o SC rotation).
	Copy Zone	Disabled when eight Zones are already set.
	Delete Zone	
Sounding Zone	Toggle Enable	Enables and disables the Sounding Zone.
	Delete Sounding Zone	
	Add Sounding Symbol	Up to eight Sounding Symbols can be added.
FCH	Toggle Enable	Enables and disables the FCH.
	Delete FCH	
MAC Message	Toggle Enable	Enables and disables the selected MAC Message.
	Delete MAC Message	
	Add DL-MAP	Enabled when there is no DL-MAP in the tree view.
	Add UL-MAP	Enabled when there is no UL-MAP in the tree view, and DL-MAP Type is set to Compressed DL-MAP.
	Add SUB-DL-UL-MAP	Enabled when DL-MAP Type of DL-MAP is set to Compressed DL-MAP. Up to three SUB-DL-UL-MAPs can be added.

Table C-1 Correspondence between items on tree view and available menu items (Cont'd)

Items in Tree View	Available Menu Items	Restrictions
DL-Burst#0 (Zone#0)	Toggle Enable	Enables and disables the DL-Burst #0.
	Copy Burst	Disabled when sixteen Bursts are already set.
	Add UL-MAP	Enabled when there is no UL-MAP in the tree view.
	Add DCD	Enabled when there is no DCD in the tree view.
	Add UCD	Enabled when there is no UCD in the tree view.
	Add MAC PDU	Up to 32 MAC PDUs can be added.
DL-Bursts#1 to #15 (Zone #0) DL-Bursts#0 to #15 (Zones#1 to #7) MAP-Burst	Toggle Enable	Enables and disables the selected Burst.
	Copy Burst	Disabled when sixteen Bursts are already set.
	Delete Burst	Disabled when only one Burst is added to the Zone.
	Add DCD	Enabled when there is no DCD in the tree view.
	Add UCD	Enabled when there is no UCD in the tree view.
	Add MAC PDU	Up to 32 MAC PDUs can be added.
DL-HARQ Bursts#0 to #15 (Zones#0 to 7)	Toggle Enable	Enables and disables the selected DL-HARQ Burst.
	Delete DL-HARQ Burst	Deletes the DL-HARQ Burst.
	Add Sub-Burst	Adds a Sub-Burst. Up to 32 Sub-Bursts can be added. Cannot be added when there is no region in the DL-HARQ Burst for a Sub-Burst to be added.
UL-Burst#0 (Zones#0 to #7)	Toggle Enable	Enables and disables the selected UL-Burst.
	Copy Burst	Disabled when sixteen Bursts are already set.
	Add MAC PDU	Up to 32 MAC PDUs can be added.
UL-Bursts#1 to #15 (Zones#0 to #7)	Toggle Enable	Enables and disables the selected UL-Burst.
	Copy Burst	Disabled when sixteen Bursts are already set.
	Delete Burst	
	Add MAC PDU	Up to 32 MAC PDUs can be added.
UL-HARQ Bursts#0 to #15 (Zones#0 to #7)	Toggle Enable	Enables and disables the selected UL-HARQ Burst.
	Delete UL-HARQ Burst	
	Add Sub-Burst	Adds a Sub-Burst. Up to 16 Sub-Bursts can be added.

Table C-1 Correspondence between items on tree view and available menu items (Cont'd)

Items in Tree View	Available Menu Items	Restrictions
Sounding Symbols#0 to #7	Toggle Enable	Enables and disables the selected Sounding Symbol.
	Delete Sounding Symbol	Disabled for Sounding Symbol#0.
	Add CID	Up to 128 CIDs can be added.
Initial/Handover Ranging Region	Toggle Enable	Enables and disables the Initial/ Handover Ranging Region.
	Add Initial/Handover Ranging Burst	Up to sixteen Initial/Handover Ranging Bursts can be added.
	Add BW Request/ Periodic Ranging Burst	Enabled when Ranging Region Combination is set to Combine. Up to sixteen BW Request/Periodic Ranging Bursts can be added.
	Delete Initial/ Handover Ranging Region	
BW Request/Periodic Ranging Region	Toggle Enable	Enables and disables the BW Request/ Periodic Ranging Region.
	Add BW Request/ Periodic Ranging Burst	Up to sixteen BW Request/Periodic Ranging Bursts can be added.
	Delete BW Request/ Periodic Ranging Region	
Fast-Feedback Region	Toggle Enable	Enables and disables the Fast-Feedback Region.
	Add Fast-Feedback Burst	Up to 32 Fast-Feedback Bursts can be added.
	Delete Fast-Feedback Region	
UL-ACK Region	Toggle Enable	Enables and disables the UL-ACK Region.
	Delete UL-ACK Region	
	Add UL-ACK Burst	Up to 32 UL-ACK Bursts can be added.
DL-MAP	Toggle Enable	Enables and disables the selected DL-MAP.
	Delete DL-MAP	
UL-MAP	Toggle Enable	Enables and disables the selected UL-MAP.
	Delete UL-MAP	
SUB-DL-UL-MAP	Toggle Enable	Enables and disables the selected SUB-DL-UL-MAP.
	Delete SUB-DL-UL-MAP	

Table C-1 Correspondence between items on tree view and available menu items (Cont'd)

Items in Tree View	Available Menu Items	Restrictions
DCD	Toggle Enable	Enables and disables the selected DCD.
	Delete DCD	
UCD	Toggle Enable	Enables and disables the selected UCD.
	Delete UCD	
MAC PDUs#0 to #31	Toggle Enable	Enables and disables the selected MAC PDU.
	Delete MAC PDU	
	Copy MAC PDU	Disabled when 32 MAC PDUs are already set.
Initial/Handover Ranging Burst	Toggle Enable	Enables and disables the selected Initial/ Handover Ranging Burst.
	Delete Initial/ Handover Ranging Burst	Disabled when only one Initial/Handover Ranging Burst is added to the Initial /Handover Ranging Region.
BW Request/Periodic Ranging Burst	Toggle Enable	Enables and disables the selected BW Request/Periodic Ranging Burst.
	Delete BW Request/ Periodic Ranging Burst	Disabled when only one BW Request/ Periodic Ranging Burst is added to the BW Request/Periodic Ranging Region.
Fast-Feedback Burst	Toggle Enable	Enables and disables the selected Fast-Feedback Burst.
	Delete Fast-Feedback Burst	Disabled when only one Fast-Feedback Burst is added to the Fast-Feedback Region.
UL-ACK Burst	Toggle Enable	Enables and disables the selected UL-ACK Burst.
	Delete UL-ACK Burst	Disabled when only one UL-ACK Burst is added to the UL-ACK Region.
CID	Toggle Enable	Enables and disables the selected CID.
	Delete CID	Disabled when only one CID is added to the Sounding Symbol.

Appendix D Parameter List

This appendix provides tables that list the parameters described in Sections 3.1.3 “Common parameters” and 3.1.4 “PHY/MAC parameters”, along with their respective item names in the Tree view, setting range, and restrictions.

Table D-1 Common Parameters

Item in Tree View	Parameter	Setting Range	Restriction
Common	Number of Tx Antennas	1, 2	
	Number of Frames	The maximum number of frames that can be stored in the waveform memory	This parameter cannot be edited when Frame Duration = Continuous. When the maximum number is exceeded due to other parameter's setting, it is reset to 1.
	Initial Frame Number	000000 to FFFFFF (hex)	Cannot be edited when Frame Duration is set to Continuous.
	FFT size	128, 512, 1024, 2048	
	G	1/4, 1/8, 1/16, 1/32	
	Oversampling Ratio	2, 4, 8	When a sampling frequency equal to or greater than 160 MHz, 8 cannot be selected.
	Band Width	1.25, 1.50, 1.75, 2.50, 3.00, 3.50, 5.00, 6.00, 7.00, 8.75, 10.00, 12.00, 14.00, 15.00, 17.50, 20.00, 24.00, 28.00 MHz	
	n	8/7, 28/25	
	Frame Duration	2.0, 2.5, 4.0, 5.0, 8.0, 10.0, 12.5, 20.0 ms, Continuous	
	Used subchannel Bitmap bit 0 to bit 5	0, 1	bit1, bit3, and bit5 cannot be edited when FFT size is set to 128 or 512. When Segment Index is set to 0, bit0 is set to 1 and cannot be edited. When Segment Index is set to 1, bit2 is set to 1 and cannot be edited. When Segment Index is set to 2, bit4 is set to 1 and cannot be edited.
	Uplink Allocation Start Time	0 to Frame End PS	Cannot be edited when Frame Duration is set to Continuous.
	UL Allocated Subchannels Bitmap	All Subchannels	Only All Subchannels can be set.

Table D-1 Common Parameters (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common	DL AMC Allocated Physical Bands Bitmap	When FFT size = 2048: 000000000000 to FFFFFFFFFFFF (hex) When FFT size = 1024: 000000000000 to 000000FFFFFF (hex) When FFT size = 512: 000000000000 to 000000000FFF (hex) When FFT size = 128: 000000000000 to 000000000007 (hex)	
	Continuous OFDMA Symbols	2 to the maximum number of OFDMA Symbol that can be stored in the waveform memory	Can be edited when Frame Duration = Continuous. It can be edited in 2 symbol steps. When the maximum number is exceeded due to other parameter's setting, it is reset to 2.
	Continuous Data Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, User File	Can be edited when Frame Duration is set to Continuous.
	Continuous Data Type Repeat Data	0000 to FFFF (hex)	Can be edited when Frame Duration is set to Continuous and Continuous Data Type is set to 16 bit repeat.
	Continuous Data Type User File		Can be edited when Frame Duration is set to Continuous and Continuous Data Type is set to User File.
	Continuous Modulation Type	QPSK, 16QAM, 64QAM	Can be edited when Frame Duration is set to Continuous.
	TTG	Display only	
	RTG	Display only	
	Subcarrier Spacing	Display only	
	Sampling Frequency	Display only	Changes depending on the settings of Band Width, n (Sampling Factor), and Oversampling Ratio.
	Segment Index	0, 1, 2	When Frame Duration is set to Continuous, the value is set to 0 and cannot be edited.
	Preamble Index	Refer to the description of Preamble Index in Section 3.1.3 "Common parameters".	Cannot be edited when Frame Duration is set to Continuous.
	Roll off length	0 to 32 (Oversampling Ratio = 2)	

Table D-1 Common Parameters (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common	Filter		
	Filter Type	Non, Gaussian, Root Nyquist, Nyquist, Ideal	
	Roll Off/BT	0.1 to 1.0	Cannot be edited when Filter Type is set to Non or Ideal.
	Filter Length	1 to 1024	Cannot be edited when Filter Type is set to Non or Ideal.
	DLFP		
	Repetition Coding Indication	No repetition, 2, 4, 6	Cannot be edited when Frame Duration is set to Continuous.
	Coding Indication	CC, CTC	Cannot be edited when Frame Duration is set to Continuous.

Table D-2 Downlink (PHY/MAC Parameters)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
	DIUC Setting	Auto, Manual	
	DIUC 0 to 12	QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6	
	UIUC Setting	Auto, Manual	
	UIUC 1 to 10	QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6	
Segment			
	Multi-Path Setting		
	Data Status	Enable, Disable	Enables and disables the multi-path processing function. Refer to Section 3.2.5 “Multi-path processing” for details.
	Setting items for Tx Antennas 0, 1 (Only Tx Antenna 0 is displayed when Number of Tx Antennas is set to 1.)		
	Multi-Path Number	1 to 20	
	Delay	0 to 10000.0 (ns)	
	Gain	–80 to 0.0 (dB)	
	Phase	0 to 359.9 (deg)	
Downlink			
	Data Status	Enable, Disable	
Preamble			
	Data Status	Enable, Disable	
	Preamble Index	Display only	Displays the set value of the same name common parameter.
	IDcell	Display only	Displays the value obtained from the set values of the common parameters Segment Index and Preamble Index.

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Preamble			
Zones#0 to #7			
	Data Status	Enable, Disable	
	Permutation	PUSC, PUSC (all SC), FUSC, AMC (6x1), AMC (3x2), AMC (2x3), AMC (1x6)	Fixed to PUSC for Zone#0.
	Pilot Position	Hopping, Center	Enabled in zones for which Permutation is set to AMC (1x6), AMC (2x3), AMC (3x2), or AMC (6x1).
	Dedicated Pilot	0, 1	Enabled in Zones#1 to #7 for which Permutation is set to PUSC, PUSC (all SC), AMC (1x6), AMC (2x3), AMC (3x2), or AMC (6x1).
	Pilot Boosting	OFF, ON	Enabled when STC/MIMO is set to 2 antenna matrix A (STTD) or 2 antenna matrix B vertical encoding.
	STC/MIMO	No transmit diversity, 2 Antenna Matrix A (STTD), 2 Antenna Matrix B vertical encoding	Can be set for PUSC, PUSC (all SC) zones when Number of Tx Antennas is set to 2. Fixed to No transmit diversity for DL-Zone #0.
	OFDMA Symbol Offset	0 to 255 symbols	Fixed to 1 symbol (with Preamble) or 0 symbols (without Preamble) for Zone#0. For Zones#1 to #7, the setting range is from 1 to 255 symbols (with Preamble) or from 0 to 255 symbols (without Preamble).
	No. OFDMA Symbols	When Permutation = PUSC or PUSC (all SC): 2 to 254 symbols When Permutation = FUSC: 1 to 255 symbols When Permutation = AMC (6x1): 1 to 255 symbols When Permutation = AMC (3x2): 2 to 254 symbols When Permutation = AMC (2x3): 3 to 255 symbols When Permutation = AMC (1x6): 6 to 252 symbols	Can be set in 2-symbol steps. Can be set in 1-symbol steps. Can be set in 1-symbol steps. Can be set in 2-symbol steps. Can be set in 3-symbol steps. Can be set in 6-symbol steps.
	DL-PermBase	0 to 31	Fixed to 0 for Zone#0.

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
	DL-Burst Number	1 to 16	
	PRBS_ID	0 to 3	Not displayed for Zone#0.
FCH (Can be added to Zone#0 only.)			
	Data Status	Enable, Disable	
	FCH Type	16 bit repeat, PN9fix, PN15fix, DLFP, User File	
	FCH Type Repeat Data	0000 to FFFF (hex)	Displayed when FCH Type is set to 16 bit repeat.
	FCH Type User File		Displayed when FCH Type is set to User File.
	Used subchannel Bitmap bits 0 to 5	Display only	Displays the set value of the same name common parameter.
	Repetition Coding Indication	Display only	Displays the set value of the same name parameter belonging to the common parameter DLFP.
	Coding Indication	Display only	Displays the set value of the same name parameter belonging to the common parameter DLFP.
	DL-MAP Length	Display only	Displays the set value of the same name parameter belonging to the common parameter DL-MAP.
MAC Message (Can be added to Zone#0 only.)			
	Data Status	Enable, Disable	
DL-MAP			
	Data Status	Enable, Disable	
	DL-MAP Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, DL-MAP, Compressed DL-MAP, User File	Only Compressed DL-MAP can be selected when UL-MAP is added to the MAC Message.
	DL-MAP Type Repeat Data	0000 to FFFF (hex)	Displayed when DL-MAP Type is set to 16 bit repeat.
	DL-MAP Type User File		Displayed when DL-MAP Type is set to User File.
	DL-MAP Length	0 to 255 slots	Calculated value is displayed when DL-MAP Type is set to DL-MAP or Compressed DL-MAP. Otherwise, set the DL-MAP length.
	DCD Count	0 to 255	Enabled when DL-MAP Type is set to DL-MAP or Compressed DL-MAP.

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
MAC Message (Can be added to Zone#0 only.)			
DL-MAP			
	Base Station ID	0000 0000 0000 to FFFF FFFF FFFF (hex)	Enabled when DL-MAP Type is set to DL-MAP or Compressed DL-MAP.
	DL-MAP PHY Synchronization Field		
	Frame Duration	Display only	Displays the set value of the same name common parameter.
	Initial Frame Number	Display only	Displays the set value of the same name common parameter.
	Zone#m DL-MAP IE#n (m = 0 to 7, n = 0 to 15) (The number of items to be displayed depends on the set number of DL-Bursts.)		
	DIUC	0 to 12	Automatically set and cannot be edited when DIUC Setting is set to Auto.
	OFDMA Symbol Offset	Display only	Displays the set value of the corresponding DL-Burst.
	OFDMA Subchannel Offset	Display only	Displays the set value of the corresponding DL-Burst.
	Boosting	Display only	Displays the set value of the corresponding DL-Burst.
	No. OFDMA Symbols	Display only	Displays the set value of the corresponding DL-Burst.
	No. Subchannels	Display only	Displays the set value of the corresponding DL-Burst.
	Repetition Coding Indication	Display only	Displays the set value of the corresponding DL-Burst.
	Zone#m STC/Zone Switch IE (m = 0 to 7) (The number of items to be displayed depends on the set number of zones.)		
	OFDMA Symbol Offset	Display only	Displays the set value of the corresponding DL-Zone.
	Permutation	Display only	Displays the set value of the corresponding DL-Zone.
	DL Use All SC Indicator	Display only	
	DL-PermBase	Display only	Displays the set value of the corresponding DL-Zone.
	Zone#m DL-HARQ Burst IE #n (m = 0 to 7, n = 0 to 15) (The number of items to be displayed depends on the set number of DL-Bursts.)		

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
MAC Message (Can be added to Zone#0 only.)			
DL-MAP			
UL-MAP (Can be added only when DL-MAP Type is set to Compressed DL-MAP.)			
	Data Status	Enable, Disable	
	UL-MAP Type	16 bit repeat, PN9fix, PN15fix, S_QPSK,S_16QAM, S_64QAM, Compressed UL-MAP, User File	
	UL-MAP Type Repeat Data	0000 to FFFF (hex)	Displayed when UL-MAP Type is set to 16 bit repeat.
	UL-MAP Type User File		Displayed when UL-MAP Type is set to User File.
	UL-MAP Length	0 to 2037 bytes	Calculated value is displayed when UL-MAP Type is set to Compressed UL-MAP. Otherwise, set the UL-MAP length. For the UL-MAP that is actually mapped, 10 bytes (6-byte MAC Header and 4-byte CRC) are added to the number of bytes set by this parameter.
	UCD Count	0 to 255	Enabled when UL-MAP Type is set to Compressed UL-MAP.
	Uplink Allocation Start Time	Display only	Displays the set value of the same name common parameter.
	Zone#m UL-MAP IE#n (m = 0 to 7, n = 0 to 15) (The number of items to be displayed depends on the set number of UL-Bursts.)		
	CID	0 to 65535	
	UIUC	1 to 10	Automatically set and cannot be edited when UIUC Setting is set to Auto.
	UL-Burst Duration	Display only	Displays the set value of the corresponding UL-Burst.
	Repetition Coding Indication	Display only	Displays the set value of the corresponding UL-Burst.
	Zone#m UL-HARQ Burst IE #n (m = 0 to 7, n = 0 to 15) (The number of items to be displayed depends on the set number of UL-HARQ Bursts.)		

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
MAC Message (Can be added to Zone#0 only.)			
SUB-DL-UL-MAP (Can be added only when DL-MAP Type is set to Compressed DL-MAP.)			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	Display only	
	OFDMA Subchannel Offset	Display only	
	Length	Display only	
	FEC Code Type and Modulation Type	QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6, QPSK (No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)	
	Repetition Coding Indication	No repetition, 2, 4, 6	Can be set when FEC Code Type and Modulation Type is set to QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding). Otherwise, only No repetition can be set.
	RCID Type	Normal CID, RCID11, RCID7, RCID3	
	HARQ ACK offset indicator	0, 1	
	DL HARQ ACK offset	0 to 255	Enabled when HARQ ACK offset indicator is set to 1.
	UL HARQ ACK offset	0 to 255	Enabled when HARQ ACK offset indicator is set to 1.
	DL IE Count	Display only	
	OFDMA Symbol Offset	0 to 255	
	OFDMA Subchannel Offset	0 to 255	

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-Bursts#0 to #15			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	From [OFDMA Symbol Offset set for the Zone to which the DL-Burst belongs] to 255 symbols	The upper limit may be smaller than 255 symbols, depending on the OFDMA Symbol Offset and the setting resolution set for the Zone.
	OFDMA Subchannel Offset	When Permutation is other than AMC (2x3) or AMC (1x6): 0 to 63 When Permutation is AMC (2x3) or AMC (1x6): 0 to 255	
	Boosting	–12, –9, –6, –3, 0, +3, +6, +9 dB	
	No. OFDMA Symbols	2 to 126 symbols (for PUSC) 2 to 126 symbols (for PUSC (all SC)) 1 to 127 symbols (for FUSC) 1 to 127 symbols (for AMC (6x1)) 2 to 126 symbols (for AMC (3x2)) 3 to 93 symbols (for AMC (2x3)) 6 to 90 symbols (for AMC (1x6))	
	No. Subchannels	1 to 63	
	Repetition Coding Indication	No repetition, 2, 4, 6	Can be set when FEC Code Type and Modulation Type is set to QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding). Otherwise, only No repetition can be set.
	FEC Code Type and Modulation Type	QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6, QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)	

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-Bursts#0 to #15			
	Inclusion MAP	Normal, SUB-DL-UL-MAP#n (n = 0 to 2)	Only those added to the tree are displayed as SUB-DL-UL-MAP#n (n = 0 to 2).
	DL-Burst Data Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, MAC PDU, User File	
	DL-Burst Data Type Repeat Data	0000 to FFFF (hex)	Displayed when DL-Burst Data Type is set to 16 bit repeat.
	DL-Burst Data Type User File		Displayed when DL-Burst Data Type is set to User File.
	MAC PDU Number	0 to 32	Displayed when DL-Burst Data Type is set to MAC PDU.
	Matrix Indicator	matrix A, matrix B	Enabled when STC/MIMO is set to 2 antenna matrix A (STTD) or 2 antenna matrix B vertical encoding.
MAP-Bursts#0 to #2			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	From [OFDMA Symbol Offset set for the Zone to which the DL-Burst belongs] to 255 symbols	The upper limit may be smaller than 255 symbols, depending on the OFDMA Symbol Offset and the setting resolution set for the Zone.
	OFDMA Subchannel Offset	0 to [Number of subchannels for Zone]	
	Length	1 to 255 slots	
	Repetition Coding Indication	No repetition, 2, 4, 6	Can be set when FEC Code Type and Modulation Type is set to QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding). Otherwise, only No repetition can be set.

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
MAP-Bursts#0 to #2			
	FEC Code Type and Modulation Type	QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6, QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)	
	MAP-Burst Data Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, MAC PDU, User File	
	MAP-Burst Data Type Repeat Data	0000 to FFFF (hex)	Displayed when MAP-Burst Data Type is set to 16 bit repeat.
	MAP-Burst Data Type User File		Displayed when MAP-Burst Data Type is set to User File.
	MAC PDU Number	0 to 32	Displayed when MAP-Burst Data Type is set to MAC PDU.
DL-HARQ Bursts#0 to #15			
	Data Status	Enable, Disable	
	RCID_Type	Normal CID, RCID11, RCID7, RCID3	
	OFDMA Symbol Offset	From [OFDMA Symbol Offset set for the Zone to which the DL-HARQ Burst belongs] to 255 symbols	The upper limit may be smaller than 255 symbols, depending on the OFDMA Symbol Offset and the setting resolution set for the Zone.
	OFDMA Subchannel Offset	0 to [Number of subchannels for Zone to which the DL-HARQ Burst belongs]	
	Boosting	–12, –9, –6, –3, 0, +3, +6, +9 dB	
	Rectangular Sub-Burst Indicator	0, 1	Enabled in zones for which Permutation is set to AMC (1x6), AMC (2x3), AMC (3x2), or AMC (6x1).

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-HARQ bursts#0 to #15			
	No. OFDMA Symbols	2 to 126 symbols (for PUSC) 2 to 126 symbols (for PUSC (all SC)) 1 to 127 symbols (for FUSC) 1 to 127 symbols (for AMC (6x1)) 2 to 126 symbols (for AMC (3x2)) 3 to 126 symbols (for AMC (2x3)) 6 to 126 symbols (for AMC (1x6))	
	No. Subchannels	1 to 127	
	Mode	Chase HARQ, MIMO Chase HARQ	MIMO Chase HARQ can be set in zones for which STC/MIMO is set to 2 antenna matrix A (STTD) or 2 antenna matrix B vertical encoding.
	N sub-burst	Display only	
	N ACK Channel	1 to 16	
	Inclusion MAP	Normal, SUB-DL-UL-MAP#n (n = 0 to 2)	Only those added to the tree are displayed as SUB-DL-UL-MAP#n (n = 0 to 2).
Sub-Bursts#0 to #15			
	Data Status	Enable, Disable	
	CID	0 to 65535	
	Sub-Burst Duration	1 to 1023	The upper limit may be smaller than 1023, depending on the size of the DL-HARQ Burst.
	Sub-Burst DIUC Indication	0, 1	Fixed to 1 and cannot be changed for Sub-Burst#0. Fixed to 1 and cannot be changed when Mode is set to MIMO Chase HARQ.
	Repetition Coding Indication	No repetition, 2, 4, 6	Can be set when FEC Code Type and Modulation Type is set to QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding). Otherwise, only No repetition can be set. Enabled when Sub-Burst DIUC Indication is set to 1.

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-HARQ bursts#0 to #15			
Sub-Bursts#0 to #15			
	FEC Code Type and Modulation Type	QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6, QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)	Enabled when Sub-Burst DIUC Indication is set to 1.
	Sub-Burst Data Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, MAC PDU, User File	
	Sub-Burst Data Type Repeat Data	0000 to FFFF (hex)	Displayed when Sub-Burst Data Type is set to 16 bit repeat.
	Sub-Burst Data Type User File		Displayed when Sub-Burst Data Type is set to User File.
	MAC PDU Number	0 to 32	Displayed when Sub-Burst Data Type is set to MAC PDU.
	MU Indicator	0, 1	Enabled when Mode is set to MIMO Chase HARQ.
	Dedicated MIMO DL Control Indicator	0, 1	Enabled when Mode is set to MIMO Chase HARQ.
	Matrix Indicator	matrix A, matrix B	Enabled when Mode is set to MIMO Chase HARQ.
	CRC Error Insertion	Correct, Error	
	ACID	0 to 15	
	AI_SN	0, 1	
	ACK disable	0, 1	
	Dedicated DL Control Indicator	00, 01, 10, 11	Disabled when Mode is set to MIMO Chase HARQ.

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-HARQ Bursts#0 to #15			
Sub-Bursts#0 to #15			
	Duration (d)	0 to 63	Enabled when Dedicated DL Control Indicator is set to 01 or 11. Disabled when Mode is set to MIMO Chase HARQ.
	Allocation Index	0 to 7	Enabled when Dedicated DL Control Indicator is set to 01 or 11 and Duration (d) is not 0. Disabled when Mode is set to MIMO Chase HARQ.
	Period (p)	0 to 7	Enabled when Dedicated DL Control Indicator is set to 01 or 11 and Duration (d) is not 0. Disabled when Mode is set to MIMO Chase HARQ.
	Frame offset	0 to 7	Enabled when Dedicated DL Control Indicator is set to 01 or 11 and Duration (d) is not 0. Disabled when Mode is set to MIMO Chase HARQ.
	Dedicated DL Control IE	0, 1	Enabled when Dedicated DL Control Indicator is set to 10 or 11. Disabled when Mode is set to MIMO Chase HARQ.
	No. SDMA layers	1 to 4	Enabled when Dedicated DL Control Indicator is set to 10 or 11 and Dedicated DL Control IE is set to 1. Disabled when Mode is set to MIMO Chase HARQ.
DL-Burst#0			
UL-MAP (Can be added to Zone#0 Burst#0 only)			
	Data Status	Enable, Disable	
	UL-MAP Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, UL-MAP, User File	
	UL-MAP Type Repeat Data	0000 to FFFF (hex)	Displayed when UL-MAP Type is set to 16 bit repeat.
	UL-MAP Type User File		Displayed when UL-MAP Type is set to User File.

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-Bursts#0 to #15			
UL-MAP (Can be added to Zone#0 Burst#0 only)			
	UL-MAP Length	0 to 2037 bytes	Calculated value is displayed when UL-MAP Type is set to UL-MAP. Otherwise, set the UL-MAP length. For the UL-MAP that is actually mapped, 10 bytes (6-byte MAC Header and 4-byte CRC) are added to the number of bytes set by this parameter.
	UCD Count	0 to 255	Enabled when UL-MAP Type is set to UL-MAP.
	Uplink Allocation Start Time	Display only	Displays the set value of the same name common parameter.
	Zone#m UL-MAP IE#n (m = 0 to 7, n = 0 to 15) (The number of items to be displayed depends on the set number of UL-Bursts.)		
	CID	0 to 65535	
	UIUC	1 to 10	Automatically set and cannot be edited when UIUC Setting is set to Auto.
	UL-Burst Duration	Display only	Displays the set value of the corresponding UL-Burst.
	Repetition Coding Indication	Display only	Displays the set value of the corresponding UL-Burst.
	Zone#m UL-HARQ Burst IE#n (m = 0 to 7, n = 0 to 15) (The number of items to be displayed depends on the set number of UL-HARQ Bursts.)		
DL-Bursts#0 to #15 or MAP-Bursts#0 to #2			
DCD (Counted as one of MAC PDU.)			
	Data Status	Enable, Disable	
	DCD Offset	0 to [Number of Frames – 1]	
	DCD Interval	1 to Number of Frames	
	DCD Length	When DCD Data Type is set to TLV: Display only When DCD Data Type is not set to TLV: 0 to 2037	
	DCD Data Type	16 bit repeat, PN9fix, PN15fix, S_QPSK,S_16QAM, S_64QAM, UL-MAP, User File, TLV	

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-Bursts#0 to #15 or MAP-Bursts#0 to #2			
DCD (Counted as one of MAC PDU.)			
	DCD Data Type Repeat Data	0000 to FFFF (hex)	Displayed when DCD Data Type is set to 16 bit repeat.
	DCD Data Type User File		Displayed when DCD Data Type is set to User File.
	Configuration Change Count	0 to 255	Enabled when DCD Data Type is set to TLV.
	TLV encoded information (The following items are enabled when DCD Data Type is set to TLV.)		
	Frequency	0 to 6000000 (kHz)	
	Base Station ID	When DL-MAP exists in the tree: Display only When no DL-MAP exists in the tree: 0000 0000 0000 to FFFF FFFF FFFF (hex)	
	MAC Version	1 to 6	
	BS EIRP	–32767 to 32768 (dBm)	
	TTG	Display only	
	RTG	Display only	
	EIRxP_IR_MAX	–32767 to 32768 (dBm)	
	HO Type Support	HO, MDHO, FBSS HO	
	Paging Group ID	0000 to FFFF (hex)	
	Trigger Type	0 to 3	
	Trigger Function	0 to 6	
	Trigger Action	1 to 3	
	Trigger Value	00 to FF (hex)	
	Trigger averaging Duration	0 to 255	
	BS Restart Count	00 to FF (hex)	
	Default RSSI and averaging parameter	00 to FF (hex)	
	DL AMC Allocated Physical Bands Bitmap	Display only	
	Hysteresis margin	00 to FF (hex)	
	Time to trigger duration	00 to FF (hex)	

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-Bursts#0 to #15 or MAP-Bursts#0 to #2			
DCD (Counted as one of MAC PDU.)			
	DL Burst Profile		
	DIUC = 0 to 12	Display only	Displays DIUC and FEC Type that are associated in DIUC List of PHY/MAC parameter of Common.
UCD (Counted as one of MAC PDU.)			
	Data Status	Enable, Disable	
	UCD Offset	0 to [Number of Frames – 1]	
	UCD Interval	1 to Number of Frames	
	UCD Length	When UCD Data Type is set to TLV: Display only When UCD Data Type is not set to TLV: 0 to 2037	
	UCD Data Type	16 bit repeat, PN9fix, PN15fix, S_QPSK,S_16QAM, S_64QAM, UL-MAP, User File, TLV	
	UCD Data Type Repeat Data	0000 to FFFF (hex)	Displayed when UCD Data Type is set to 16 bit repeat.
	UCD Data Type User File		Displayed when UCD Data Type is set to User File.
	Configuration Change Count	0 to 255	Enabled when UCD Data Type is set to TLV.
	Ranging Backoff Start	0 to 255	Enabled when UCD Data Type is set to TLV.
	Ranging Backoff End	0 to 255	Enabled when UCD Data Type is set to TLV.
	Request Backoff Start	0 to 255	Enabled when UCD Data Type is set to TLV.

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-Bursts#0 to #15 or MAP-Bursts#0 to #2			
UCD (Counted as one of MAC PDU.)			
	Request Backoff End	0 to 255	Enabled when UCD Data Type is set to TLV.
	TLV encoded information for overall Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, User File	Not continuous between frames.
	TLV encoded information (The following items are enabled when DCD Data Type is set to TLV.)		
	Frequency	0 to 6000000 (kHz)	
	Contention-based Reservation Timeout	00 to FF (hex)	
	Start of Ranging Coded Group	00 to FF (hex)	
	Band AMC Allocation Threshold	00 to FF (hex)	
	Band AMC Release Threshold	00 to FF (hex)	
	Band AMC Allocation Timer	00 to FF (hex)	
	Band AMC Release Timer	00 to FF (hex)	
	Band AMC Status Reporting Max Period	00 to FF (hex)	
	Band AMC Retry Timer	00 to FF (hex)	
	Normalized C/N Override-2	0000000000000000 to FFFFFFFFFFFFFFFF (hex)	
	Use CQICH Indication Flag	00 to FF (hex)	
	Handover Ranging Codes	00 to FF (hex)	
	Initial Ranging Codes	00 to FF (hex)	
	Initial Ranging Interval	00 to FF (hex)	
	Tx Power Report	0000 to FFF (hex)	
	Normalized C/N for channel Sounding	00 to FF (hex)	
	Initial Ranging backoff start	00 to FF (hex)	

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-Bursts#0 to #15 or MAP-Bursts#0 to #2			
UCD (Counted as one of MAC PDU.)			
	Initial Ranging backoff end	00 to FF (hex)	
	Bandwidth request backoff start	00 to FF (hex)	
	Bandwidth request backoff end	00 to FF (hex)	
	Permutation Base	00 to FF (hex)	
	UL Allocated Subchannels Bitmap	Display only	
	HARQ Ack Delay for DL burst	00 to FF (hex)	
	UL AMC Allocated Physical Bands Bitmap	000000000000 to FFFFFFFFFFFF (hex)	
	Size of CQICH-ID field	00 to FF (hex)	
	Band-AMC entry average CINR	00 to FF (hex)	
	HO ranging start	00 to FF (hex)	
	HO ranging end	00 to FF (hex)	
	Periodic Ranging Codes	00 to FF (hex)	
	Bandwidth Request Codes	00 to FF (hex)	
	Periodic Ranging Backoff Start	00 to FF (hex)	
	Periodic Ranging Backoff End	00 to FF (hex)	
	CQICH Band AMC Transition Delay	00 to FF (hex)	

Table D-2 Downlink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
DL-Bursts#0 to #15, MAP-Bursts#0 to #2, or Sub-Bursts#0 to #15			
UCD (Counted as one of MAC PDU.)			
	UL Burst Profile		
	UIUC = 1 to 10	Display only	Displays UIUC and FEC Type that are associated in UIUC List of PHY/MAC parameter of Common.
	Ranging Data Ratio	00 to FF (hex)	
MAC PDUs#0 to #31 (Up to 32 MAC PDUs can be added, including DCD and UCD.)			
	Data Status	Enable, Disable	
	MAC PDU Length	Display only	
	Payload Data Length	When CI = No CRC: 0 to 2041 bytes When CI = With CRC: 0 to 2037 bytes When CI = Without Header & CRC: 0 to 2047 bytes	
	CID	0 to 65535	
	CI	With CRC, No CRC, Without Header & CRC	
	CRC Error Insertion	Correct, Error	
	Payload Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, User File	
	Payload Type Repeat Data	0000 to FFFF (hex)	Displayed when Payload Type is set to 16 bit repeat.
	Payload Type User File		Displayed when Payload Type is set to User File.

Table D-3 Uplink (PHY/MAC Parameters)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Uplink			
	Data Status	Enable, Disable	
Zones#0 to #7			
	Data Status	Enable, Disable	
	Permutation	PUSC, PUSC (w/o SC rotation), AMC (6x1), AMC (3x2), AMC (2x3), AMC (1x6)	
	Pilot Position	Hopping, Center	Enabled in zones for which Permutation is set to AMC (1x6), AMC (2x3), AMC (3x2), or AMC (6x1).
	STC/MIMO	Display only	Fixed to No transmit diversity.
	OFDMA Symbol Offset	0 to 255 symbols	
	No. OFDMA Symbols	3 to 255 symbols (PUSC, PUSC (w/o SC rotation)) 1 to 255 symbols (AMC(6x1)) 2 to 254 symbols (AMC(3x2)) 3 to 255 symbols (AMC(2x3)) 6 to 252 symbols (AMC(1x6))	
	UL-PermBase	0 to 69	
	UL-Burst Number	1 to 16	
UL-Bursts#0 to #15			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	From [OFDMA Symbol Offset set for Zone] to [OFDMA Symbol Offset set for Zone + No. OFDMA Symbols set for Zone] symbols	
	OFDMA Subchannel Offset	0 to [Number of subchannels for Zone – 1] Refer to Section 3.2.3 “Settable number of subchannels” for the number of subchannels for Zone.	
	UL Burst Duration	3 to 3069 symbols (for PUSC), 3 to 3069 symbols (for PUSC (w/o SC rotation)), 1 to 1023 symbols (for AMC(6x1)), 2 to 2046 symbols (AMC(3x2)), 3 to 3069 symbols (AMC(2x3)), 6 to 6138 symbols (AMC(1x6))	
	Burst Power Offset	–10.0 to 10.0 dB	
	Pilot Pattern	Normal, PatternA, PatternB	

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Uplink			
Zones#0 to #7			
UL-Bursts#0 to #15			
	Repetition Coding Indication	No repetition, 2, 4, 6	Can be set when FEC Code Type and Modulation Type is set to QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding). Otherwise, only No repetition can be set.
	FEC Code Type and Modulation Type	QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6, QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)	
	Inclusion MAP	Normal, SUB-DL-UL-MAP#n (n = 0 to 2)	Only those added to the tree are displayed as SUB-DL-UL-MAP#n (n = 0 to 2).
	UL-Burst Data Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, MAC PDU, User File	
	UL-Burst Data Type Repeat Data	0000 to FFFF (hex)	Displayed when UL-Burst Data Type is set to 16 bit repeat.
	UL-Burst Data Type User File		Displayed when UL-Burst Data Type is set to User File.
	MAC PDU Number	0 to 32	Displayed when UL-Burst Data Type is set to MAC PDU.

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
UL-HARQ bursts#0 to #15			
	Data Status	Enable, Disable	
	RCID Type	Normal CID, RCID11, RCID7, RCID3	
	OFDMA Symbol Offset	[OFDMA Symbol Offset of Zone] to [OFDMA Symbol Offset of Zone + No. OFDMA Symbols of Zone] symbols	
	OFDMA Subchannel Offset	0 to [Number of Subchannels of Zone] – 1 See Section 5.2.3 "Settable number of subchannels" for the number of subchannels of Zone.	
	Mode	Chase HARQ (Display only)	
	Allocation Start Indication	0, 1	
	N SubBurst	1 to 16	
	Inclusion MAP	Normal, SUB-DL-UL-MAP#n (n = 0 to 2)	Only those added to the tree are displayed as SUB-DL-UL-MAP#n (n = 0 to 2).
Sub-Bursts#0 to #15			
	Data Status	Enable, Disable	
	CID	0 to 65535	
	FEC Code Type and Modulation Type	QPSK(CC)1/2, QPSK(CC)3/4, 16QAM(CC)1/2, 16QAM(CC)3/4, 64QAM(CC)1/2, 64QAM(CC)2/3, 64QAM(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, 16QAM(CTC)1/2, 16QAM(CTC)3/4, 64QAM(CTC)1/2, 64QAM(CTC)2/3, 64QAM(CTC)3/4, 64QAM(CTC)5/6, QPSK(No Ch Coding), 16QAM(No Ch Coding), 64QAM(No Ch Coding)	

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Downlink			
Zones#0 to #7			
UL-HARQ bursts#0 to #15			
Sub-Bursts#0 to #15			
	Repetition Coding Indication	No repetition, 2, 4, 6	Can be set when FEC Code Type and Modulation Type is set to QPSK(CC)1/2, QPSK(CC)3/4, QPSK(CTC)1/2, QPSK(CTC)3/4, or QPSK(No Ch Coding). Otherwise, only No repetition can be set.
	Sub-Burst Duration	3 to 3069 symbols (PUSC), 3 to 3069 symbols (PUSC (w/o SC rotation)), 1 to 1023 symbols (AMC (6x1)), 2 to 2046 symbols (AMC (3x2)), 3 to 3069 symbols (AMC (2x3)), 6 to 6138 symbols (AMC (1x6))	
	Sub-Burst Data Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, User File	
	Sub-Burst Data Type Repeat Data	0000 to FFFF (hex)	Displayed when Sub-Burst Data Type is set to 16 bit repeat.
	Sub-Burst Data Type User File	0000 to FFFF (hex)	Displayed when Sub-Burst Data Type is set to User File.
	MAC PDU Number	0 to 32	Displayed when Sub-Burst Data Type is set to MAC PDU.
	CRC Error Insertion	Correct, Error	
	Dedicated UL Control Indicator	0, 1	
	SDMA Control Info bit	0, 1	Enabled when Dedicated UL Control Indicator is set to 1.
	Num SDMA layers	1 to 4	Enabled when both Dedicated UL Control Indicator and SDMA Control Info bit are set to 1.
	Pilot Pattern	PatternA, PatternB, PatternC, PatternD	Enabled when both Dedicated UL Control Indicator and SDMA Control Info bit are set to 1.
	ACID	0 to 15	
	AI_SN	0, 1	
	ACK disable	0, 1	

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Uplink			
Zones#0 to #7			
UL-Bursts#0 to #15 or Sub-Bursts#0 to #15			
MAC PDUs#0 to #31 (Up to 32 MAC PDUs can be added.)			
	Data Status	Enable, Disable	
	MAC PDU Length	Display only	
	Payload Data Length	When CI = No CRC: 0 to 2041 bytes When CI = With CRC: 0 to 2037 bytes When CI = Without Header & CRC: 0 to 2047 bytes	
	CID	0 to 65535	
	CI	With CRC, No CRC, Without Header & CRC	
	CEC Error Insertion	Correct, Error	
	Payload Type	16 bit repeat, PN9fix, PN15fix, S_QPSK, S_16QAM, S_64QAM, User File	
	Payload Type Repeat Data	0000 to FFFF (hex)	Displayed when Payload Type is set to 16 bit repeat.
	Payload Type User File		Displayed when Payload Type is set to User File.
Initial/Handover Ranging Region			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	From [OFDMA Symbol Offset set for the Zone to which the Initial/Handover Ranging Region belongs] to 255 symbols	The upper limit may be smaller than 255 symbols, depending on the OFDMA Symbol Offset and the setting resolution set for the Zone.
	OFDMA Subchannel Offset	When Permutation is PUSC or PUSC (w/o SC rotation): 0 to 126 When Permutation is other than PUSC or PUSC (w/o SC rotation): 0 to 120	
	No. OFDMA Symbols	3 to 126 symbols (for PUSC) 3 to 126 symbols (for PUSC (w/o SC rotation)) 1 to 127 symbols (AMC(6x1)) 2 to 126 symbols (AMC(3x2)) 3 to 126 symbols (AMC(2x3)) 6 to 126 symbols (AMC(1x6))	

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Uplink			
Zones#0 to #7			
Initial/Handover Ranging Region			
	No. Subchannels	When Permutation is PUSC or PUSC (w/o SC rotation): 6 to 126 When Permutation is other than PUSC or PUSC (w/o SC rotation): 8 to 120	
	Initial/Handover Ranging Symbols	2, 4	
	Initial/Handover Ranging Burst Num	1 to 16	
	Ranging Region Combination	Non, Combine	
	BW Request/Periodic Ranging Offset	0 to 32	Displayed only when Ranging Region Combination = Combine.
	BW Request/Periodic Ranging Symbols	1, 3	Displayed only when Ranging Region Combination = Combine.
	BW Request/Periodic Ranging Burst Num	1 to 16	Displayed only when Ranging Region Combination = Combine.
Initial/Handover Ranging Burst			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	0 to 255 symbols	The upper limit may be smaller than 255 symbols, depending on the setting of Initial/Handover Ranging Symbols.
	OFDMA Subchannel Offset	When Permutation is PUSC or PUSC (w/o SC rotation): 0 to 126 When Permutation is other than PUSC or PUSC (w/o SC rotation): 0 to 120	
	No. OFDMA Symbols	When Initial/Handover Ranging Symbols = 2: 2 When Initial/Handover Ranging Symbols = 4: 4	Display only
	No. Subchannels	When Permutation is PUSC or PUSC (w/o SC rotation): 6 When Permutation is other than PUSC or PUSC (w/o SC rotation): 8	Display only
	Ranging Power Offset	–10.0 to 10.0 dB	
	Ranging Code Number	0 to 255	

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Uplink			
Zones#0 to #7			
BW Request/Periodic Ranging Region			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	From [OFDMA Symbol Offset set for the Zone to which the BW Request/Periodic Ranging Region belongs] to 255 symbols	The upper limit may be smaller than 255 symbols, depending on the OFDMA Symbol Offset and the setting resolution set for the Zone.
	OFDMA Subchannel Offset	When Permutation is PUSC or PUSC (w/o SC rotation): 0 to 126 When Permutation is other than PUSC or PUSC (w/o SC rotation): 0 to 120	
	No. OFDMA Symbols	3 to 126 symbol (for PUSC) 3 to 126 symbols (for PUSC (w/o SC rotation)) 1 to 127 symbols (AMC(6x1)) 2 to 126 symbols (AMC(3x2)) 3 to 126 symbols (AMC(2x3)) 6 to 126 symbols (AMC(1x6))	
	No. Subchannels	When Permutation is PUSC or PUSC (w/o SC rotation): 6 to 126 When Permutation is other than PUSC or PUSC (w/o SC rotation): 8 to 120	
	BW Request/Periodic Ranging Symbols	1, 3	
	BW Request/Periodic Ranging Burst Num	1 to 16	
BW Request/Periodic Ranging Burst			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	0 to 255 symbols	
	OFDMA Subchannel Offset	When Permutation is PUSC or PUSC (w/o SC rotation): 0 to 126 When Permutation is other than PUSC or PUSC (w/o SC rotation): 0 to 120	
	No. OFDMA Symbols	When BW Request/Periodic Ranging Symbols = 1: 1 When BW Request/Periodic Ranging Symbols = 3: 3	Display only

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Uplink			
Zones#0 to #7			
BW Request/Periodic Ranging Region			
BW Request/Periodic Ranging Burst			
	No. Subchannels	When Permutation is PUSC or PUSC (w/o SC rotation): 6 When Permutation is other than PUSC or PUSC (w/o SC rotation): 8	Display only
	Ranging Power Offset	–10.0 to 10.0 dB	
	Ranging Code Number	0 to 255	
Fast-Feedback Region (Can be added to a PUSC or PUSC (w/o SC rotation) zone.)			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	From [OFDMA Symbol Offset set for the Zone to which the Fast-Feedback Region belongs] to 255 symbols	The upper limit may be smaller than 255 symbols, depending on the OFDMA Symbol Offset and the setting resolution set for the Zone.
	OFDMA Subchannel Offset	0 to 127	
	No. OFDMA Symbols	3 to 126 symbols	
	No. Subchannels	1 to 127	
	Fast Feedback Type	6	Display only
	Fast-Feedback Burst Num	1 to 32	
Fast-Feedback Burst			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	0 to 255 symbols	
	OFDMA Subchannel Offset	0 to 127	
	No. OFDMA Symbols	3	Display only
	No. Subchannels	1	Display only
	Ranging Power Offset	–10.0 to 10.0 dB	
	Payload	000000 to 111111	Enter a binary sequence.

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Uplink			
Zones#0 to #7			
UL-ACK Region (Can be added to a PUSC or PUSC (w/o SC rotation) zone.)			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	From [OFDMA Symbol Offset set for the Zone to which the UL-ACK Region belongs] to 255 symbols	The upper limit may be smaller than 255 symbols, depending on the OFDMA Symbol Offset and the setting resolution set for the Zone.
	OFDMA Subchannel Offset	0 to 127	
	No. OFDMA Symbols	3 to 126 symbols	
	No. Subchannels	1 to 127	
	UL-ACK Burst Number	1 to 32	
UL-ACK Burst			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	0 to 255 symbols	
	OFDMA Subchannel Offset	0 to 127	
	No. OFDMA Symbols	3	Display only
	No. Subchannels	1	Display only
	Occupied half subchannel	even, odd	
	UL-ACK Burst Power Offset	–10.0 to 10.0 dB	
	Payload	ACK, NACK	
Sounding Zone			
	Data Status	Enable, Disable	
	OFDMA Symbol Offset	0 to 255 symbols	
	No. OFDMA Symbols	1 to 8 symbols	
	Sounding Type	Type A (Display only)	
	Send Sounding Report Flag	0, 1	
	Sounding Relevance Flag	0, 1	
	Sounding Relevance	0, 1	Enabled when Sounding Relevance Flag is set to 0.
	Include additional feedback	No additional feedback, Channel coefficients, Received pilot coefficients, Feedback message	
	Shift Value	0 to 127	

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Uplink			
Sounding Zone			
Sounding Symbols#0 to #7			
	Data Status	Enable, Disable	
	Separability Type	All subcarriers, Decimated subcarriers	
	Max Cyclic Shift Index P	4, 8, 16, 32, 9, 18	Enabled when Separability Type is set to All subcarriers.
	Decimated Value D	2, 4, 8, 16, 32, 64, 128, 5	Enabled when Separability Type is set to Decimated subcarriers.
	Decimation offset randomization	No randomization, Pseudo-randomly	Enabled when Separability Type is set to Decimated subcarriers.
	Sounding Symbol Index	1 to 8	
	Number of CIDs	1 to 128	
CID#0 to #127			
	Data Status	Enable, Disable	
	Shorted Basic CID	0 to 4095	
	Power Assignment Method	Equal power, Per subcarrier power limit, Total power limit	
	Power Boost	No power boost, Power boost	
	Multi-Antenna Flag	First antenna only, All antennas	
	Allocation Mode	Normal, Band	
	Start Frequency Band	When FFT size is set to 2048: 0 to 95 When FFT size is set to 1024: 0 to 47 When FFT size is set to 512: 0 to 23 When FFT size is set to 128: 0 to 5	Enabled when Allocation Mode is set to Normal.
	No. Frequency Bands	When FFT size is set to 2048: 1 to 96 When FFT size is set to 1024: 1 to 48 When FFT size is set to 512: 1 to 24 When FFT size is set to 128: 1 to 6	Enabled when Allocation Mode is set to Normal.

Table D-3 Uplink (PHY/MAC Parameters) (Cont'd)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Uplink			
Sounding Zone			
Sounding Symbols#0 to #7			
CID#0 to #127			
	Band bit map	When FFT size is set to 2048, 1024, or 512: 000 to FFF (hex) When FFT size is set to 128: 0 to 7 (hex)	Enabled when Allocation Mode is set to Band.
	Sounding Relevance	0, 1	Enabled when Send Sounding Report Flag is set to 1.
	Cyclic time shift index m	0 to [Max Cyclic Shift Index P – 1]	Enabled when Separability Type is set to All subcarriers.
	Decimation Offset d	0 to [Decimated Value D – 1]	Enabled when Separability Type is set to Decimated subcarriers.
	Use same symbol for additional feedback	0, 1	Enabled when Include additional feedback is set to Channel coefficients.
	Periodicity	Single, 1, 2, 4	

Table D-4 Pattern Setting (PHY/MAC Parameters)

Item in Tree View	Parameter	Setting Range	Restriction
Common			
Segment			
Pattern Setting			
	Package	Alphanumeric characters and the following symbols: ! % & ( ) + = ` { } _ - ^ @ [ ]	Within 31 characters
	Export File Name	Alphanumeric characters and the following symbols: ! % & ( ) + = ` { } _ - ^ @ [ ]	Within 18 characters
	Line1 to Line3	Alphanumeric characters	Within 38 characters
	SG Master/Slave Setting	ON, OFF, Master, Slave	

Appendix E Connecting Multiple Mainframes

A different RF signal must be separately input to two Rx antenna input connectors to implement a 2 × 2 MIMO configuration.

There are two ways to synchronize signals when connecting multiple mainframes. One is to use an external Start/Frame trigger, the other is to use one mainframe as a master and a second mainframe as a slave.

E.1 Connecting Multiple MG3700As

Using external Start/Frame trigger

In this method, signals are synchronized by supplying an external Start/Frame trigger to multiple MG3700A units. Figure E.1-1 shows the connection diagram.

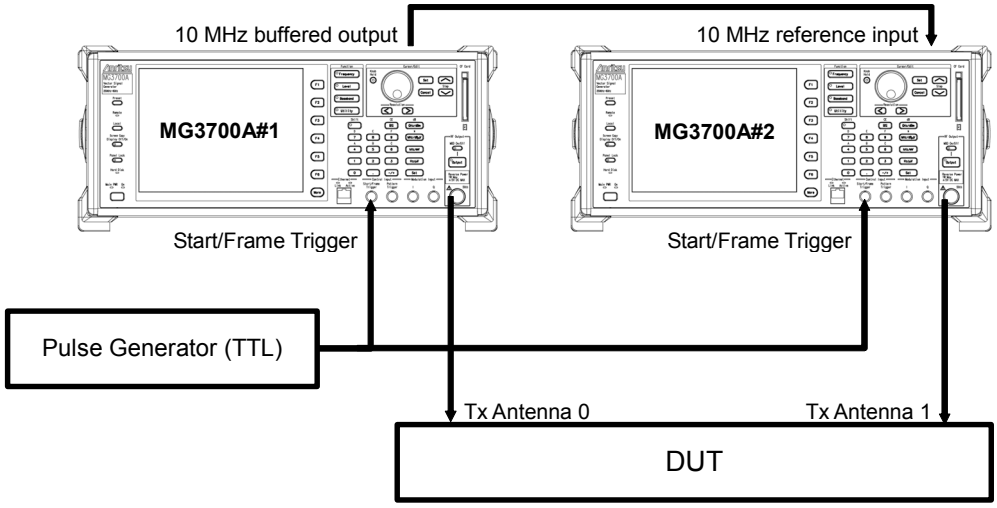


Figure E.1-1 Multiple MG3700A connection (external Start/Frame trigger)

Synchronizing baseband signals

Input a TTL-level pulse signal to the Start/Frame Trigger connector on the MG3700A #1 as well as the MG3700A #2.
Next, configure the settings as follows for these two MG3700A units:
Start/Frame Trigger:
Trigger = ON
Mode = Start

Synchronization between baseband signals is established within one sampling clock of the waveform pattern with Delay = 0 (excluding an external cable delay error).

Figure E.1-2 shows the synchronization relationship of the two MG3700A signal generators. Sampling clock *a* is determined by the sampling rate of the waveform pattern that is generated.

When the sampling rate is 20 MHz or lower:

a = sampling rate × 2^n (n is a value where 80 MHz ≤ a < 160 MHz)

When the sampling rate is higher than 20 MHz:

a = sampling rate

Note that the delay adjustment resolution changes, depending on the sampling rate. Refer to the following for details.

- MG3700A Vector Signal Generator Operation Manual (Mainframe) 3.5.3 "Setting up external input/output"

The MG3700A enters a trigger-input standby state by pressing the function key [Waveform Restart]. Enter a trigger after the settings above have been completed.

Synchronizing RF signals

The RF frequencies of the two MG3700A units are synchronized using a 10 MHz reference clock.

To change the phase relationship between the RF signals, change the setting of Phase Adjust on either of the MG3700A units.

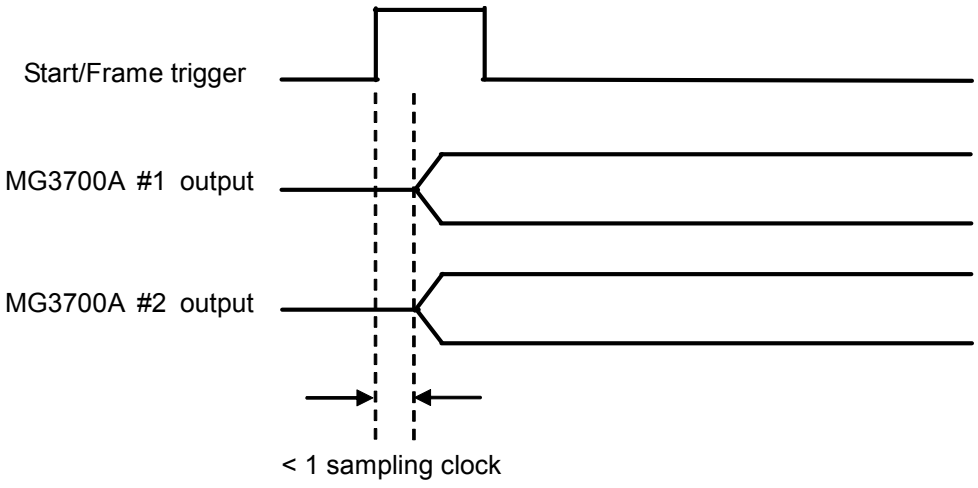


Figure E.1-2 Synchronization-baseband signals when using external Start/Frame trigger

Using Master/Slave

For this method, signals are synchronized by sending a Start/Frame Trigger from the master to the slave, where MG3700A #1 is the master and MG3700A #2 is the slave. However, when generating waveforms, the master and slave must be set to use the generated waveform pattern, because the waveform pattern that is output from the MG3700A set as the slave produces one frame of lag for the master when Delay = 0. For this software, the master and slave can be set to ON or OFF by using SG Master/Slave Setting, which is described in Section 3.1.4.34 "Pattern Setting".

- When generating two waveform patterns
  When waveforms are generated by setting SG Master/Slave Setting to ON, waveform patterns corresponding to Tx Antenna0 and Tx Antenna1 are generated.
  For the waveform pattern corresponding to Tx Antenna0, a synchronization marker is output from AUX Input/Output Connector1 at the beginning of the pattern. To achieve synchronization with Tx Antenna0, the waveform pattern corresponding to Tx Antenna1 is one frame ahead.

  Use the waveform pattern corresponding to Tx Antenna0 for the master, and use the one corresponding to Tx Antenna1 for the slave.

- When generating one waveform pattern
  When waveforms are generated by setting SG Master/Slave Setting to Master, a synchronization marker is output from AUX Input/Output Connector1 at the beginning of the generated waveform pattern.

  When waveforms are generated by setting SG Master/Slave Setting to Slave, a waveform pattern is generated that is one frame ahead to achieve synchronization with the waveform pattern generated when the SG Master/Slave Setting is set to Master.

Figure E.1-3 shows the connection, and Figure E.1-4 shows the synchronization relationship of the two MG3700A units. Compared to the method using an external Start/Frame trigger, the synchronization error is greater when using Master/Slave, for the amount of delay between the master output and Pattern Sync Marker. Refer to the following manual(s) for details on the operation when the Start/Frame trigger is input.

- MG3700A Vector Signal Generator Operation Manual (Mainframe) 3.5.4 “To output the signal in synchronization with the external trigger signal.”

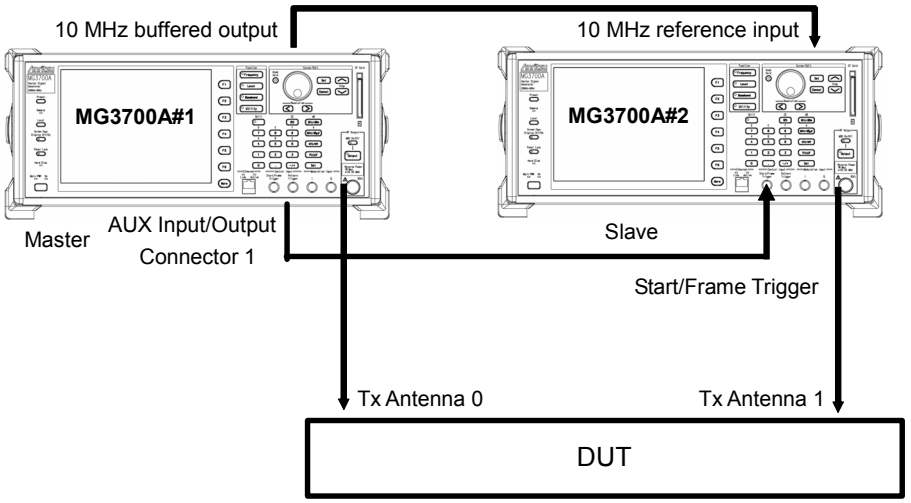


Figure E.1-3 Multiple MG3700A connection (Master/Slave)

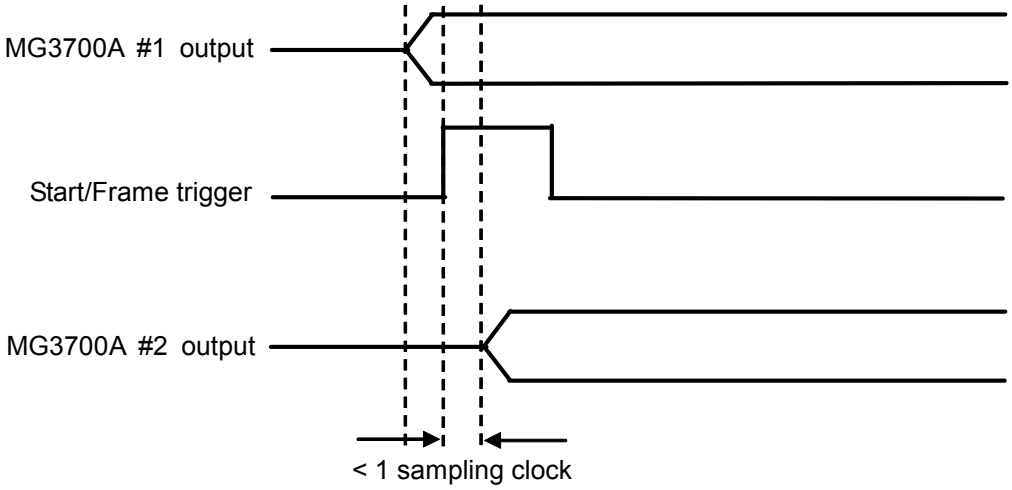


Figure E.1-4 Synchronization relationship of baseband signals when using Master/Slave

E.2 Connecting Multiple MG3710As

Using external Start/Frame trigger

In this method, signals are synchronized by supplying an external Start/Frame trigger to multiple MG3710A units. Figure E.2-1 shows the connection diagram.

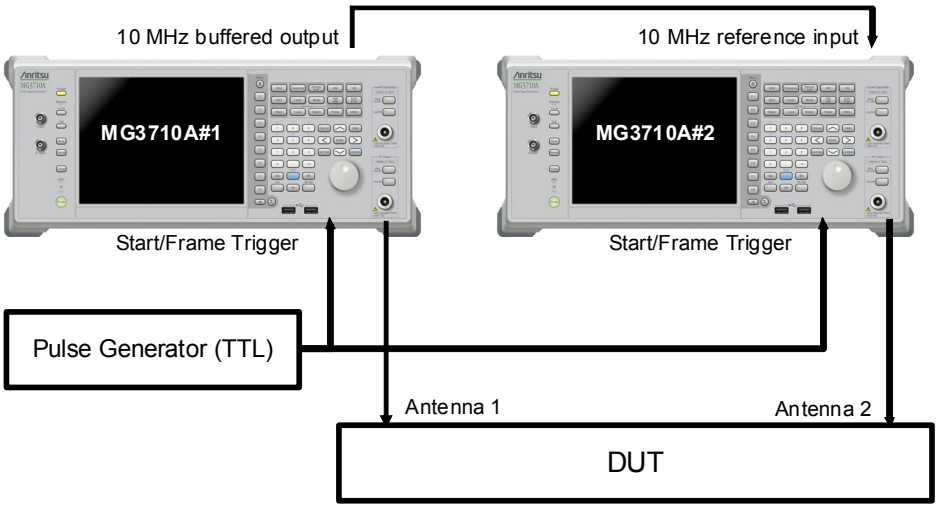


Figure E.2-1 Multiple MG3710A connection (external Start/Frame trigger)

Synchronizing baseband signals

Input a TTL-level pulse signal to the Start/Frame Trigger connector on the MG3710A #1 as well as the MG3710A #2.
Next, configure the settings as follows for these two MG3710A units:
Start/Frame Trigger:
Trigger = ON
Mode = Start

Synchronization between baseband signals is established within one sampling clock of the waveform pattern with Delay = 0 (excluding an external cable delay error).

Figure E.2-2 shows the synchronization relationship of the two MG3710A signal generators. Sampling clock *a* is determined by the sampling rate of the waveform pattern that is generated.

When the sampling rate is 20 MHz or lower:

a = sampling rate × 2^n (n is a value where 80 MHz ≤ a < 160 MHz)

When the sampling rate is higher than 20 MHz:

a = sampling rate

Note that the delay adjustment resolution changes, depending on the sampling rate. Refer to the following manual(s) for details.

- MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)
  7.3.8 "Start/Frame Trigger"

The MG3710A enters a trigger-input standby state by pressing the function key [Waveform Restart]. Enter a trigger after the settings above have been completed.

Synchronizing RF signals

The RF frequencies of the two MG3710A units are synchronized using a 10 MHz reference clock.
To change the phase relationship between the RF signals, change the setting of Phase Adjust on either of the MG3710A units.

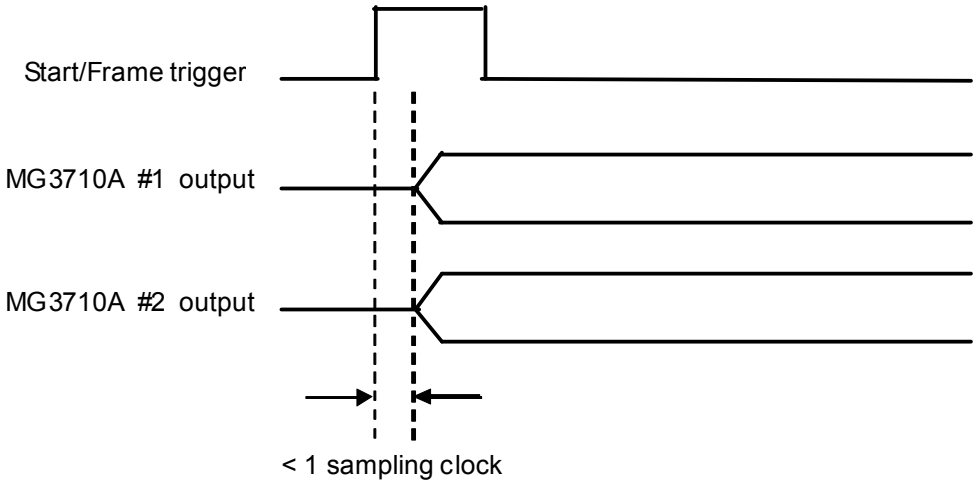


Figure E.2-2 Synchronization-baseband signals when using external Start/Frame trigger

Using Master/Slave

For this method, signals are synchronized by sending a Start/Frame Trigger from the master to the slave, where MG3710A #1 is the master and MG3710A #2 is the slave. However, when generating waveforms, the master and slave must be set to use the generated waveform pattern, because the waveform pattern that is output from the MG3710A set as the slave produces one frame of lag for the master when Delay = 0. For this software, the master and slave can be set to ON or OFF by using SG Master/Slave Setting, which is described in Section 3.1.4.34 "Pattern Setting".

- When generating two waveform patterns
  When waveforms are generated by setting SG Master/Slave Setting to ON, waveform patterns corresponding to Tx Antenna0 and Tx Antenna1 are generated.
  For the waveform pattern corresponding to Tx Antenna0, a synchronization marker is output from AUX Input/Output Connector1 at the beginning of the pattern. To achieve synchronization with Tx Antenna0, the waveform pattern corresponding to Tx Antenna1 is one frame ahead.

  Use the waveform pattern corresponding to Tx Antenna0 for the master, and use the one corresponding to Tx Antenna1 for the slave.

- When generating one waveform pattern
  When waveforms are generated by setting SG Master/Slave Setting to Master, a synchronization marker is output from AUX Input/Output Connector1 at the beginning of the generated waveform pattern.

  When waveforms are generated by setting SG Master/Slave Setting to Slave, a waveform pattern is generated that is one frame ahead to achieve synchronization with the waveform pattern generated when the SG Master/Slave Setting is set to Master.

Figure E.2-3 shows the connection, and Figure E.2-4 shows the synchronization relationship of the two MG3710A units. Compared to the method using an external Start/Frame trigger, the synchronization error is greater when using Master/Slave, for the amount of delay between the master output and Pattern Sync Marker. Refer to the following manual(s) for details on the operation when the Start/Frame trigger is input.

- MG3710A Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)
  7.3.8 “Start/Frame Trigger”

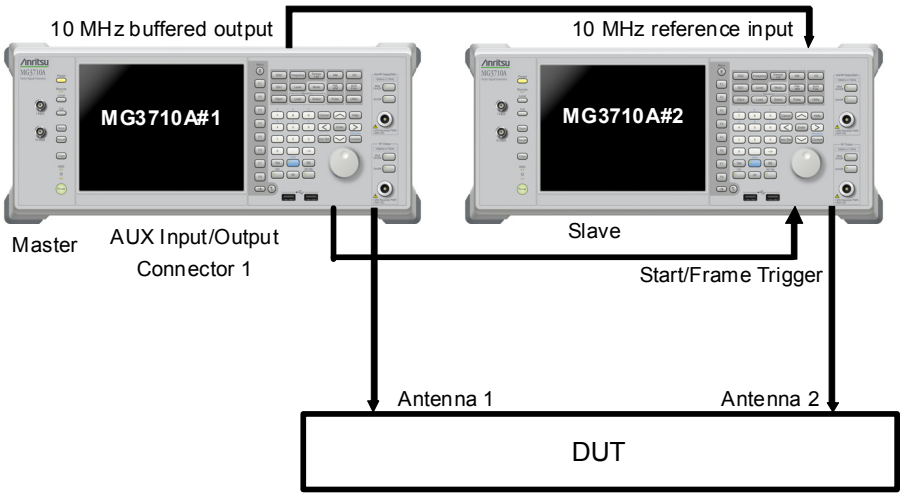


Figure E.2-3 Multiple MG3710A connection (Master/Slave)

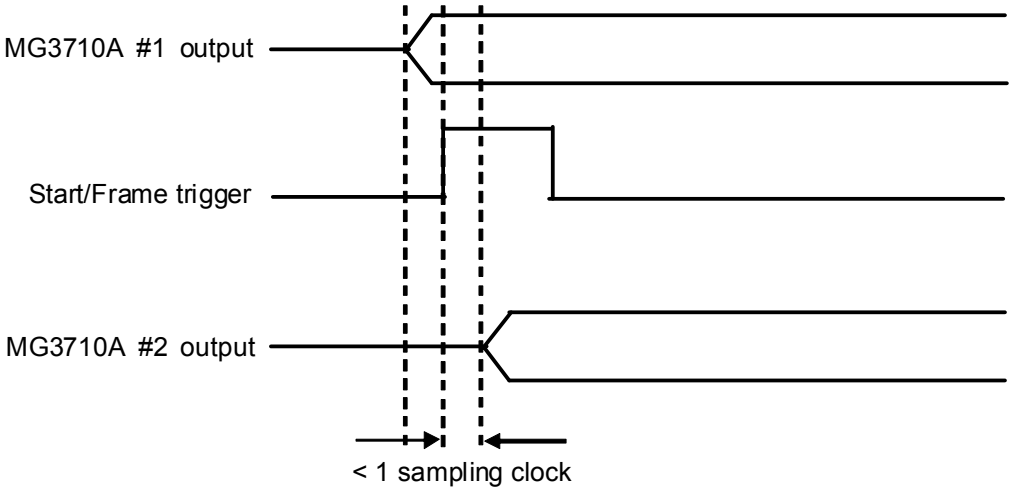


Figure E.2-4 Synchronization relationship of baseband signals when using Master/Slave

E.3 Connecting Multiple MS269xA Series or MS2830A

Using external Start/Frame trigger

In this method, signals are synchronized by supplying an external Start/Frame trigger to multiple MS2690A/MS2691A/MS2692A or MS2830A units. Figure E.3-1 shows the connection diagram.

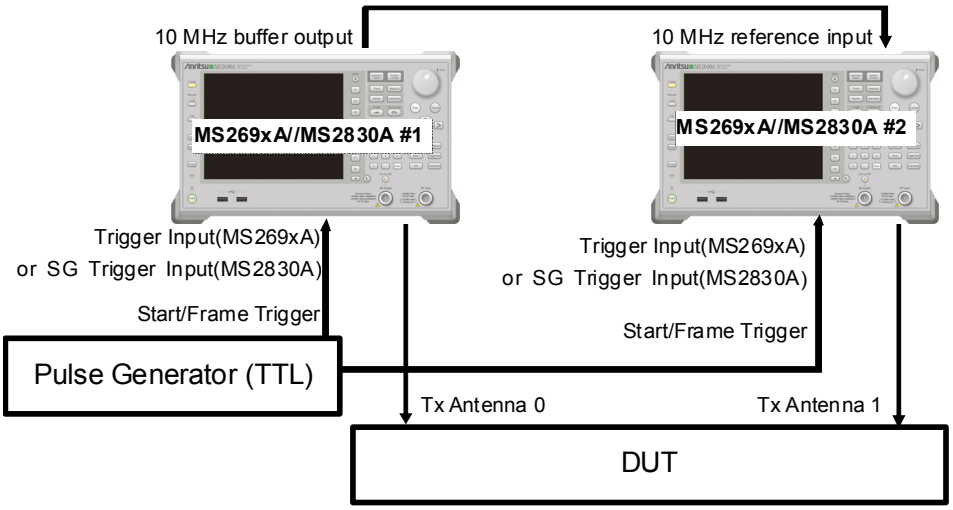


Figure E.3-1 Multiple MS2690A/MS2691A/MS2692A or MS2830A connection (external Start/Frame trigger)

Synchronizing baseband signals

Input a TTL-level pulse signal to the Start/Frame Trigger connector on the MS269x or MS2830A #1 as well as the MS269x or MS2830A #2. Next, configure the settings as follows for these two Vector Signal Generator units:

Start/Frame Trigger:

Trigger = ON

Mode = Start

Synchronization between baseband signals is established within one sampling clock of the waveform pattern with Delay = 0 (excluding an external cable delay error). Note that the delay adjustment resolution changes, depending on the sampling rate.

Figure E.3-2 shows the synchronization relationship of the two Vector Signal Generator units. Sampling clock *a* is determined by the sampling rate of the waveform pattern that is generated.

When the sampling rate is 20 MHz or lower:

a = sampling rate × 2^n (n is a value where 80 MHz ≤ a < 160 MHz)

When the sampling rate is higher than 20 MHz:

a = sampling rate

Note that the delay adjustment resolution changes depending on the sampling rate. Refer to the following manual(s) for details.

- MS2690A/MS2691A/MS2692A Signal Analyzer Option-020: Vector Signal Generator Operation Manual (Operation)
  2.6 "Setting up external input/output"
- MS2830A Vector Signal Generator Operation Manual (Operation)
  2.6 "Setting up external input/output"

The MS269x or MS2830A waits for the trigger to be input once the Waveform Restart function key is pressed. Input the trigger after this setting.

Synchronizing RF signals

The RF frequencies of the two units are synchronized using a 10 MHz reference clock.

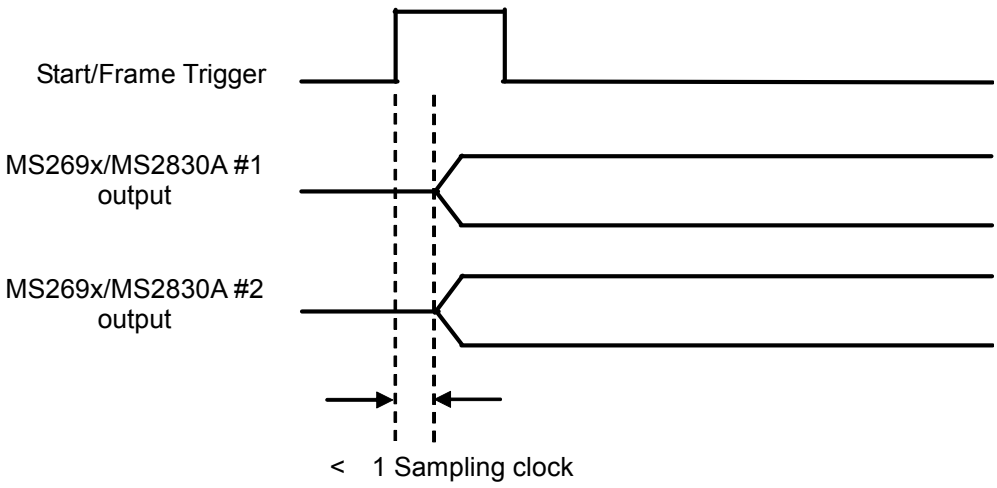


Figure E.3-2 Synchronization-baseband signals when using external Start/Frame trigger

Using Master/Slave

For this method, signals are synchronized by sending a Start/Frame Trigger from the master to the slave, where MS269x/MS2830A #1 is the master and MS269x/MS2830A #2 is the slave. However, when generating waveforms, the master and slave must be set to use the generated waveform pattern, because the waveform pattern that is output from the Vector Signal Generator set as the slave produces one frame of lag for the master when Delay = 0. For this software, the master and slave can be set to ON or OFF by using SG Master/Slave Setting, which is described in Section 3.1.4.34 "Pattern Setting".

- When generating two waveform patterns
  When waveforms are generated by setting SG Master/Slave Setting to ON, waveform patterns corresponding to Tx Antenna0 and Tx Antenna1 are generated.
  For the waveform pattern corresponding to Tx Antenna0, a synchronization marker is output from Marker1 of the AUX connector at the beginning of the pattern. To achieve synchronization with Tx Antenna0, the waveform pattern corresponding to Tx Antenna1 is one frame ahead.

  Use the waveform pattern corresponding to Tx Antenna0 for the master, and use the one corresponding to Tx Antenna1 for the slave.
- When generating one waveform pattern
  When waveforms are generated by setting SG Master/Slave Setting to Master, a synchronization marker is output from Marker1 of the AUX connector at the beginning of the generated waveform pattern.

When waveforms are generated by setting SG Master/Slave Setting to Slave, a waveform pattern is generated that is one frame ahead to achieve synchronization with the waveform pattern generated when the SG Master/Slave Setting is set to Master.

Figure E.3-3 shows the connection, and Figure E.3-4 shows the synchronization relationship of the two units. Compared to the method using an external Start/Frame trigger, the synchronization error is greater when using Master/Slave, for the amount of delay between the master output and Pattern Sync Marker. Refer to each one of the following manuals for details on the operation when the Start/Frame trigger is input.

- MS2690A/MS2691A/MS2692A Signal Analyzer Option-020: Vector Signal Generator Operation Manual (Operation)
  2.6 “Setting up external input/output”
- MS2830A Vector Signal Generator Operation Manual (Operation)
  2.6 “Setting up external input/output”

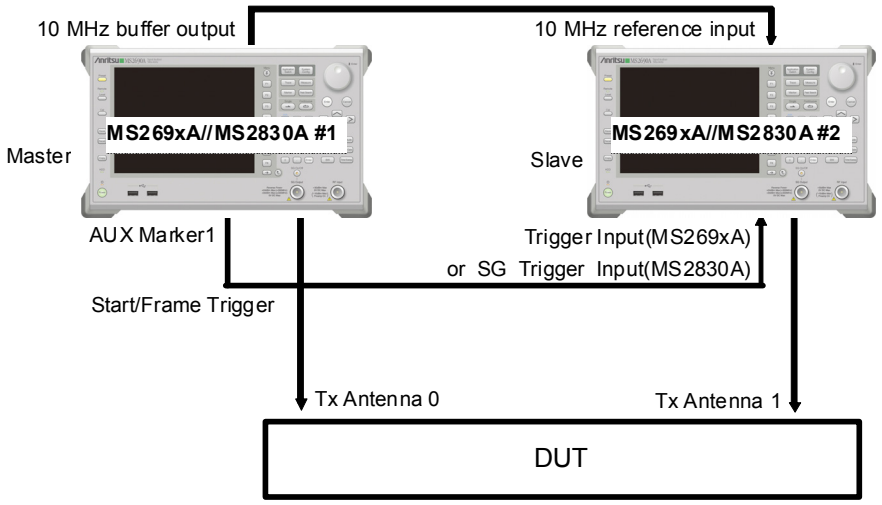


Figure E.3-3 Multiple MS2690A/MS2691A/MS2692A or MS2830A connection (Master/Slave)

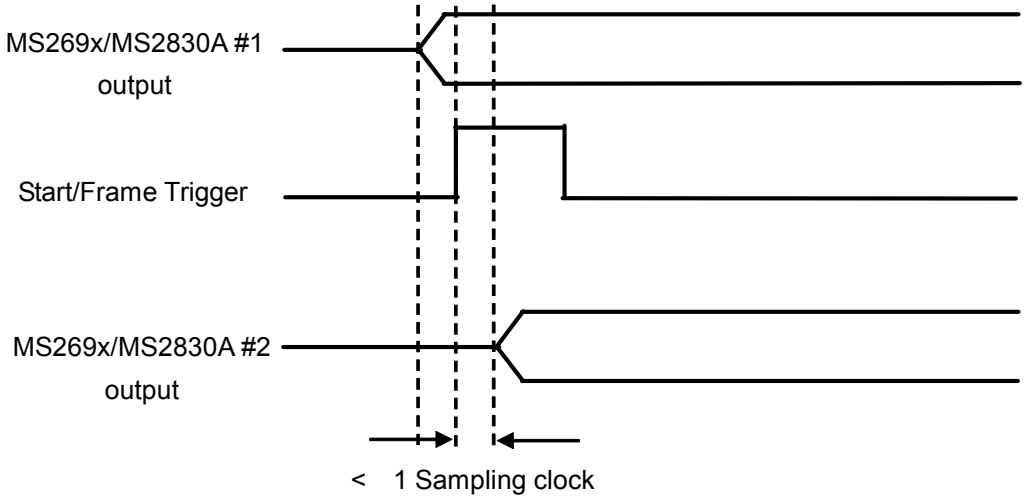


Figure E.3-4 Synchronization relationship of baseband signals when using Master/Slave

Index

References are to page numbers.

E

F

G

I

M

N

O

P

R

S

T

U

W