MX370101A/MX269901A
HSDPA/HSUPA 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/MG3710E 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 them before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W2915AE-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 minor to moderate 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.



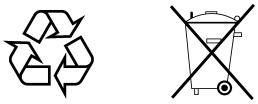
This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.



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.

MX370101A/MX269901A
HSDPA/HSUPA IQproducer™
Operation Manual

27 April 2007 (First Edition)
12 June 2026 (Ninth Edition)

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- The warranty period is 6 months from the purchase date.
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If Anritsu suffers any damages or 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.

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Revision History:

February 29th, 2020
December 17th, 2021
March 11th, 2024

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 flash drive 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 malware (malicious software such as viruses).
  This equipment runs on Windows Operating System.
  To connect this equipment to network, the following is advised.
  - Activate Firewall.
  - Install important updates of Windows.
  - Use antivirus software.

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 flash drive 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 flash drive and CF memory card).
- Connecting to network
  Connect your computer to the network that provides adequate protection against computer viruses.
- Protection against malware (malicious software such as viruses).
  To connect your computer to network, the following is advised.
  - Activate Firewall.
  - Install important updates of Windows.
  - Use antivirus software.

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)

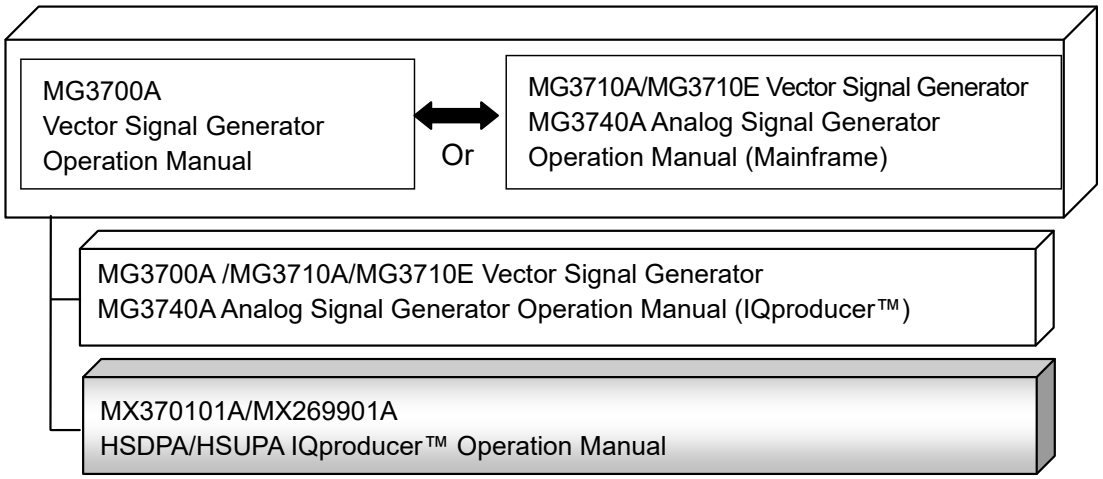
For how to turn off the functions, refer to the operation manual that came with your computer.

About This Manual

■ Associated Documents

The operation manual configuration of the MX370101A/MX269901A HSDPA/HSUPA IQproducer™ is shown below.

■ If using MG3700A, MG3710A or MG3710E:



- MG3700A Vector Signal Generator Operation Manual (Mainframe)

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

Or

- MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (Mainframe)

This describes basic operations, maintenance procedure, and remote functions of the MG3710A, MG3710E Vector Signal Generator and the MG3740A Analog Signal Generator .

- MG3700A/MG3710A/MG3710E 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 .

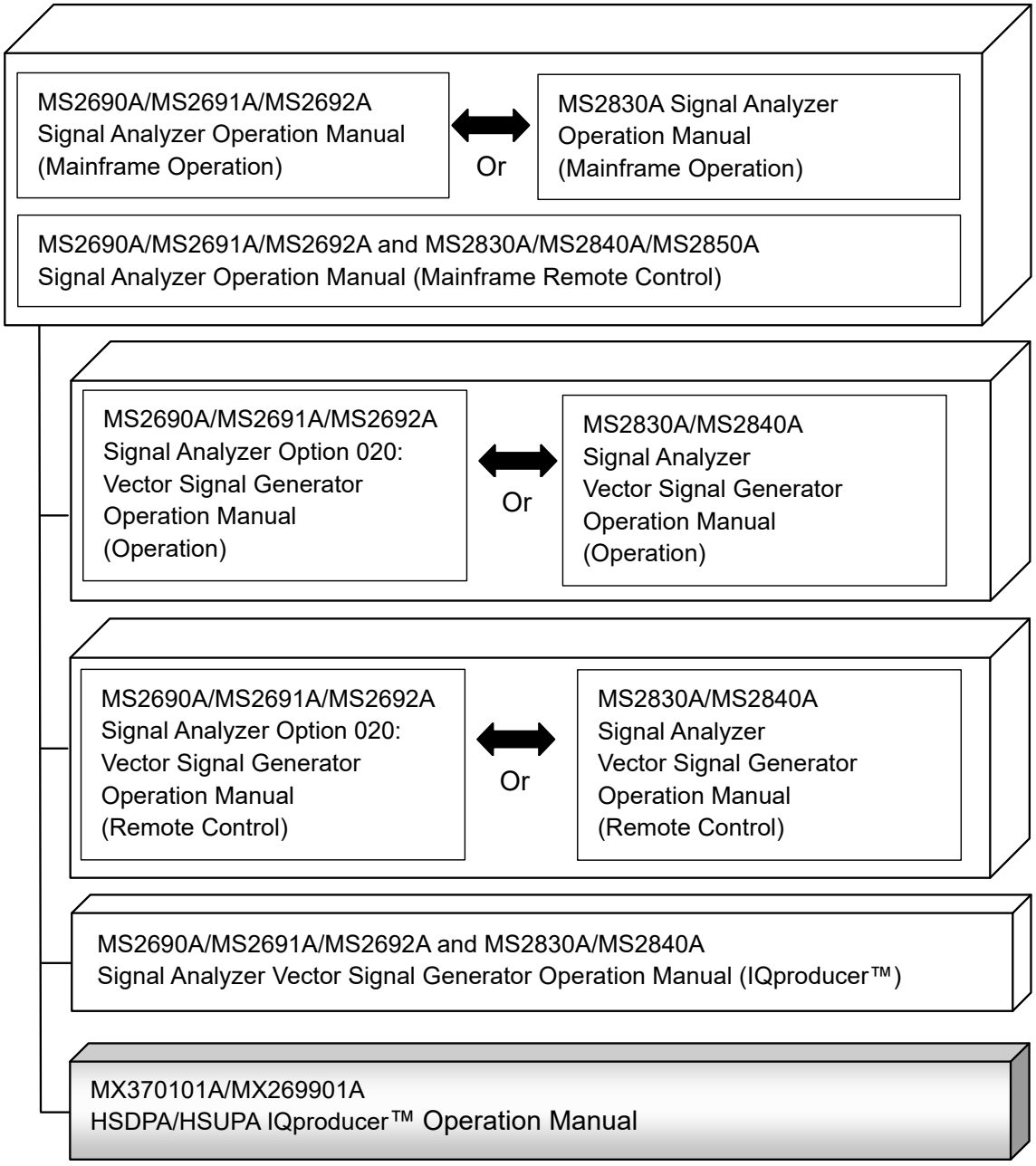
- HSDPA/HSUPA IQproducer™ Operation Manual (This document)

This describes basic operations and functions of the HSDPA/HSUPA IQproducer™.

Name Used in This Manual

In this manual, it is assumed that you use MG3710A unless otherwise noted. If you use MG3710E, read MG3710A as MG3710E.

■ **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/MS2840A/MS2850A 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/MS2840A/MS2850A.

- 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/MS2840A Signal Analyzer 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/MS2840A Signal Analyzer Vector Signal Generator Operation Manual, Remote Control

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

- MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Signal Analyzer 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.

- HSDPA/HSUPA IQproducer™ Operation Manual (This document)

This describes basic operations and functions of the HSDPA/HSUPA IQproducer™.

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Chapter 1 Overview

This chapter provides an overview of the MX370101A/MX269901A HSDPA/HSUPA IQproducer™.

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1.1 Product overview

MX370101A/MX269901A HSDPA/HSUPA IQproducer™ (hereinafter referred to as “this software”) is software used to generate waveform patterns conforming to the 3GPP HSDPA/ HSUPA 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 3GPP HSDPA/HSUPA 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	MX370101A		MX269901A	
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	LAN, USB Memory and other external device*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/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*
  4.5 “File Conversion on Convert Screen”
- *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Signal Analyzer Vector Signal Generator Operation Manual (IQproducer™)*
  4.5 “File Conversion on Convert Screen”

Chapter 2 Preparation

This chapter describes the operating environment for the MX370101A/MX269901A.

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2.1 Operating Environment

The following environment is required for operating the MX370101A/MX269901A.

(1) PC that meets the following conditions

OS	Windows XP/Windows Vista/ Windows 7/Windows 10/Windows 11
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/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*
  Chapter 2 "Installation"
- *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A Signal Analyzer 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/MG3710E 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/MG3710E 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/MS2840A Signal Analyzer 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 **IQproducer**.

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:

- The 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™.

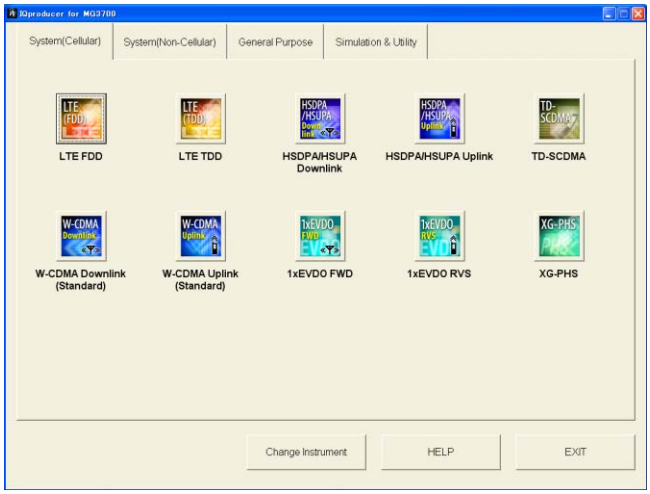


Figure 2.3.1-1 Common Platform Screen

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

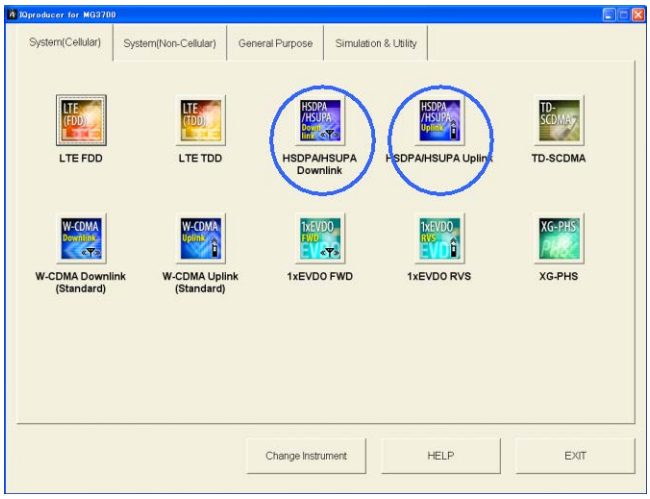


Figure 2.3.1-2 System (Cellular) Selection Screen

5. Click **HSDPA/HSUPA Downlink** or **HSDPA/HSUPA Uplink** 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™.

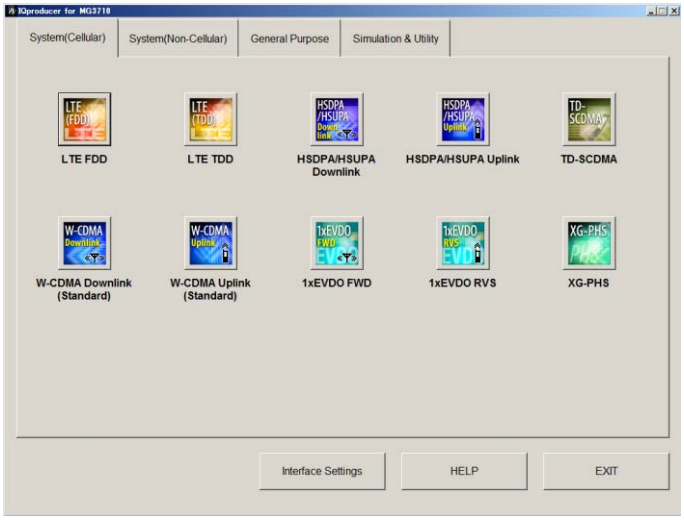


Figure 2.3.2-1 Common Platform Screen

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

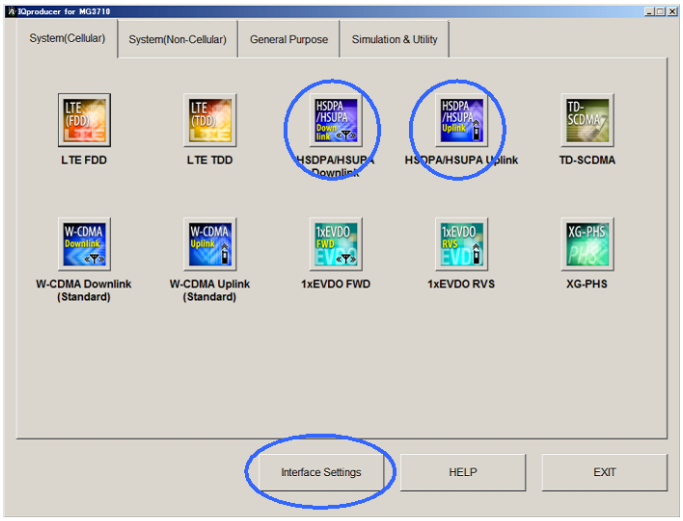


Figure 2.3.2-2 System (Cellular) Selection Screen

3. Click **HSDPA/HSUPA Downlink** or **HSDPA/HSUPA Uplink** to display the main screen. For details of the main screen, refer to Chapter 3 “Detailed Description of Functions”.

Note:

Clicking **Interface Settings** displays the Interface Setting dialog box.

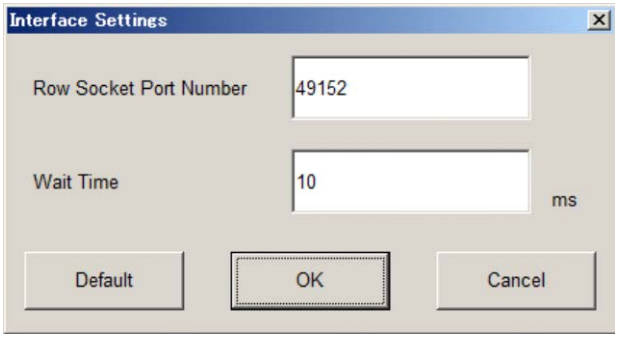


Figure 2.3.2-3 Interface Settings Dialog Box

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.

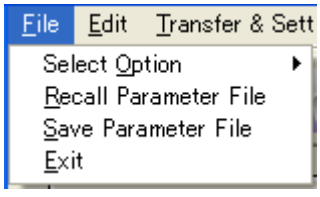


Figure 2.3.3-1 Exiting Software

The operation of the three screen buttons is explained below.

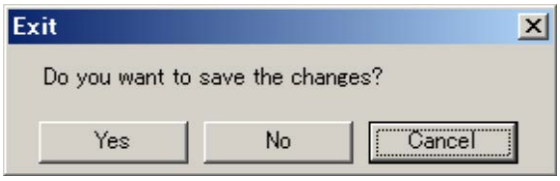


Figure 2.3.3-2 Exit Confirmation Window

- **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.

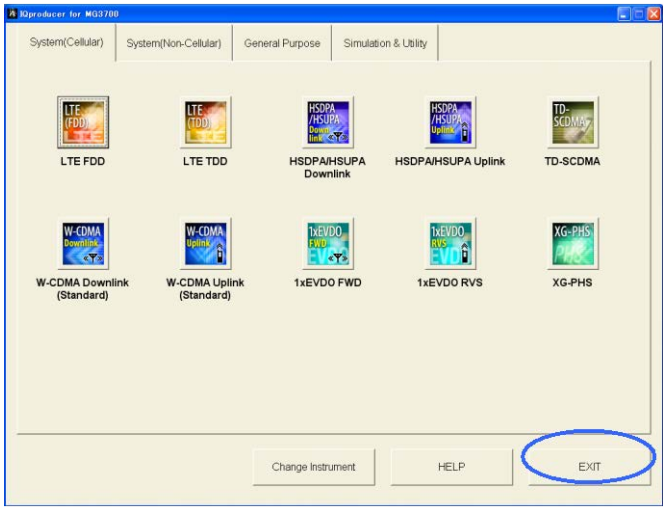


Figure 2.3.3-3 Exiting IQproducer™

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.

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3.1 Downlink Setup Screen

3.1.1 Main screen

On common platform screen, click the **System (Cellular)** tab, and then select **HSDPA/HSUPA Downlink** to display the main screen.

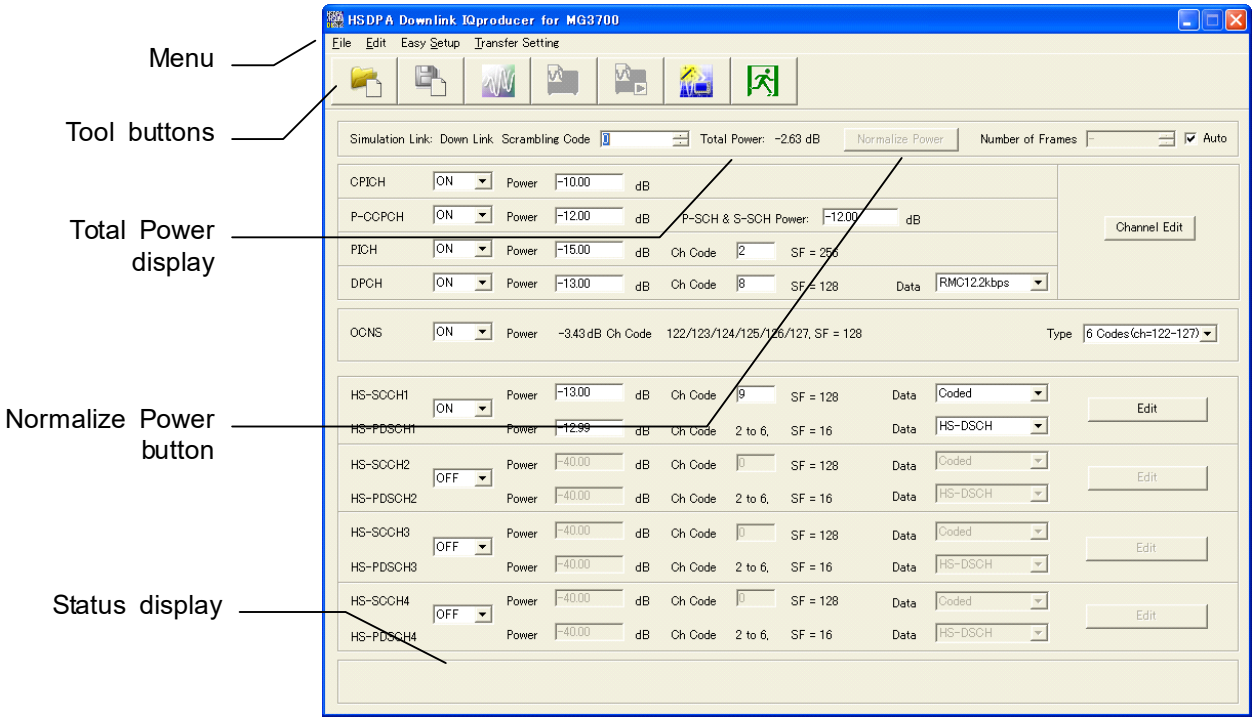


Figure 3.1.1-1 Downlink main screen

■ **File** menu

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

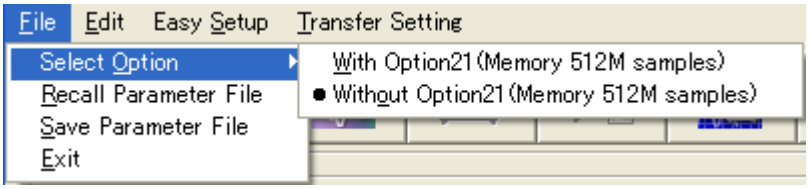


Figure 3.1.1-2 File menu

- **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 × 2 Memories
	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**
  Sets the HSDPA/HSUPA Downlink parameters according to the setting of the parameter files saved by Save Parameter File.

- **Save Parameter File**
  Saves the HSDPA/HSUPA Downlink setting parameters to a file.

- **Exit**
  Exits the HSDPA/HSUPA Downlink IQproducer™.

■ **Edit** menu

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

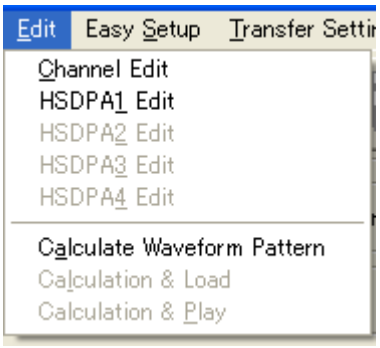


Figure 3.1.1-3 Edit menu

- **Channel Edit**
  Displays the Channel Edit screen in which the P-CCPCH and DPCH parameters are set. This is the same operation with clicking the **Channel Edit** button on the screen.

- **HSDPA1 Edit, HSDPA2 Edit, HSDPA3 Edit, HSDPA4 Edit**
  Sets the channels related to HSDPA. This is the same operation with clicking the **Edit** button on the screen.

- **Calculate Waveform Pattern**
  Starts waveform pattern generation based on the settings on the screen.
  The number of frames to be generated varies depending on the setting conditions for each channel, and the time required for generating a waveform pattern also varies accordingly. The number of frames to be generated is displayed on the calculation progress screen.

When a waveform pattern is generated, two files with the extensions ".wvi" and ".wvd" are created. When loading a waveform pattern to a memory, select the *.wvi file for the target waveform pattern.

When a waveform pattern that uses the FIR filter of the MG3700A/MG3710A mainframe is created, a file with the extension ".wvc" is created in addition to the *.wvi and *.wvd files. When transferring a waveform pattern or loading a waveform pattern to a memory, select the *.wvc file for the target waveform pattern. The settings for two memories are executed at once by this operation.

For details of waveform pattern classification, refer to Appendix B "Number of Frames to Be Generated".

- **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.

■ **Easy Setup** menu

The **Easy Setup** menu contains the following item.

- **H-Set (QPSK or 16 QAM)**

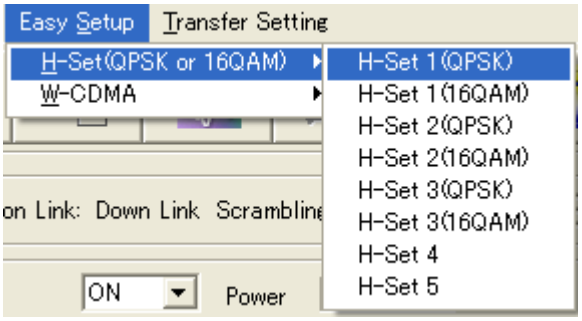


Figure 3.1.1-4 H-Set (QPSK or 16QAM) menu

Selects the setting for each H-Set from HSDPA Fixed Reference Channels (FRC) specified in 3GPP TS25.101.

Tables 3.1.1-4 and 3.1.1-5 list the parameters when each H-Set is selected.

H-Set 1(QPSK)
H-Set 1(16QAM)
H-Set 2(QPSK)
H-Set 2(16QAM)
H-Set 3(QPSK)
H-Set 3(16QAM)
H-Set 4
H-Set 5

Table 3.1.1-4 FRC H-Set common parameters

Parameter	H-Set1, H-Set2, H-Set3, H-Set4, H-Set5
Scrambling Code	0
CPICH	ON, –10 dB
P-CCPCH	ON, –12 dB P-SCH & S-SCH Power=–12 dB
PICH	ON, –15 dB, 2
DPCH	ON, –13 dB, 8, RMC12.2 kbps
OCNS	ON, 6 Codes (ch=122-127)
HS-SCCH1	ON, –13 dB, 9, Coded
HS-SCCH2	OFF, –40 dB, 0, Coded
HS-PDSCH2	–40 dB, HS-DSCH
HS-SCCH3	OFF, –40 dB, 0, Coded
HS-PDSCH3	–40 dB, HS-DSCH
HS-SCCH4	OFF, –40 dB, 0, Coded
HS-PDSCH4	–40 dB, HS-DSCH
SFN Cycle	4096
TrCH1 Data	PN9fix
TrCH2 Data	16bitRepeat
TFCI	0
Channelization Code Offset	2
RV Information	0
UE Identity	0
CRC Error Insertion	Correct
Payload Data	PN9fix
HARQ Process Cycle	6
TTI Start Offset	0
Process Setting File	Non

Table 3.1.1-5 Parameters specific to each FRC H-Set (H-Set1 and H-Set2)

Parameter	H-Set1		H-Set2	
	QPSK	16QAM	QPSK	16QAM
HS-PDSCH1	ON, –12.99 dB, HS-DSCH	ON, –12.02 dB, HS-DSCH	ON, –12.99 dB, HS-DSCH	ON, –12.02 dB, HS-DSCH
Number of Physical Channel Code	5	4	5	4
Modulation	QPSK	16QAM	QPSK	16QAM
Transport Block Size Information	41	36	41	36
Virtual IR Buffer Size	9600			
Number of HARQ Processes	2		3	
Inter-TTI Distance	3		2	

Table 3.1.1-6 Parameters specific to each FRC H-Set (H-Set3 through H-Set5)

Parameter	H-Set3		H-Set4	H-Set5
	QPSK	16QAM	QPSK	QPSK
HS-PDSCH1	ON, –12.99 dB, HS-DSCH	ON, –12.02 dB, HS-DSCH	ON, –12.99 dB, HS-DSCH	ON, –12.99 dB, HS-DSCH
Number of Physical Channel Code	5	4	5	5
Modulation	QPSK	16QAM	QPSK	QPSK
Transport Block Size Information	41	36	41	41
Virtual IR Buffer Size	9600		7200	9600
Number of HARQ Processes	6		2	3
Inter-TTI Distance	1		2	1

- W-CDMA

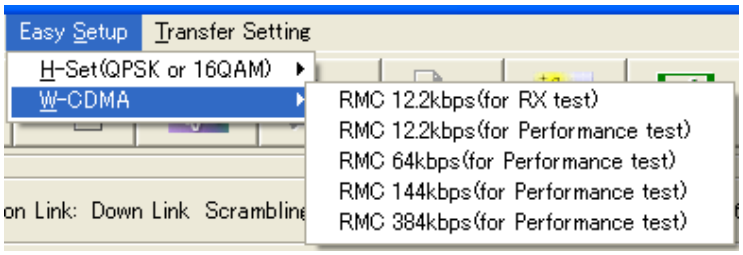


Figure 3.1.1-5 W-CDMA menu

Selects the bit rate setting for Reference Measurement Channels (RMC) specified in 3GPP TS25.101, TS25.104.
RMC 12.2 kbps (for RX test)
RMC 12.2 kbps (for Performance test)
RMC 64 kbps (for Performance test)
RMC 144 kbps (for Performance test)
RMC 384 kbps (for Performance test)

Table 3.1.1-7 Physical channel powers for RMC 12.2kbps (for RX test)

Physical Channel	Power ratio
CPICH	CPICH_Ec/DPCH_Ec = –3.32 dB
P-CCPCH	P-CCPCH_Ec/DPCH_Ec = –5.32 dB
P-SCH & S-SCH	SCH_Ec/DPCH_Ec = –5.32 dB
PICH	PICH_Ec/DPCH_Ec = –8.32 dB
DPCH	DPCH_Ec/Ior = –10.32 dB

Table 3.1.1-8 Physical channel powers for channels other than RMC 12.2kbps (for RX test)

Physical Channel		Power ratio
CPICH		CPICH_Ec/Ior = –10 dB
P-CCPCH		P-CCPCH_Ec/Ior = –12 dB
SCH		SCH_Ec/Ior = –12 dB
PICH		PICH_Ec/Ior = –15 dB
DPCH	12.2 kbps	DPCH_Ec/Ior = –16.6 dB
	64 kbps	DPCH_Ec/Ior = –12.8 dB
	144 kbps	DPCH_Ec/Ior = –9.8 dB
	384 kbps	DPCH_Ec/Ior = –5.5 dB
OCNS		The power where the total of all the channels including OCNS is 0 dB.

■ **Transfer Setting** menu

The **Transfer Setting** menu contains the following item.

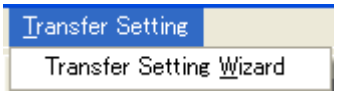


Figure 3.1.1-6 Transfer Setting menu

- **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.

■ **Tool buttons**

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


Calculate Waveform Pattern


Calculation & Load


Calculation & Play


Transfer & Setting Wizard


Exit

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

■ **Total Power display**

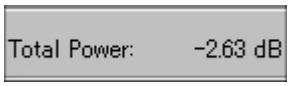


Figure 3.1.1-7 Total Power display

The total power of the channels that are set to ON (excluding OCNS) is displayed in this field. If the total power displayed here is out of ±0.01 dB when OCNS is OFF, the warning message shown in Figure 3.1.1-7 is displayed during total power calculation, prompting to normalize the total power.

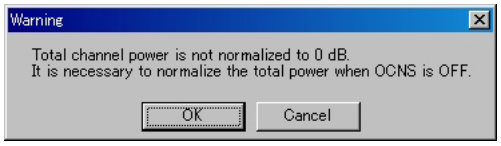


Figure 3.1.1-8 Warning message

Since the total power value displayed here is calculated from the total power of all the channels that are set to ON, if a channel that includes DTX (Discontinuous Transmission) is used, the average power within the time when all the channels are output becomes 0 dB. When a channel that includes DTX is used, therefore, the average power value obtained by measuring the RF output level with a power meter does not match the setting level of the mainframe.

■ **Normalize Power button**

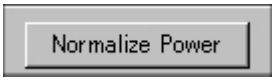


Figure 3.1.1-9 Normalize Power button

This button is enabled when OCNS is OFF. When this button is clicked, the value displayed in Total Power is subtracted from the power of each channel that is set to ON. As a result, the total power is normalized to 0 dB while retaining the power ratio between channels.

■ **Status display**

The status display on the bottom of the screen displays operation statuses such as a warning occurred during setting.

3.1.2 Details of setting parameters on main screen

This section describes the details of the setting items on the Downlink main screen.

Setting Item	Scrambling Code	
Functional Outline	Sets the downlink scrambling code number.	
Setting Parameters	Setting Range	
	Scrambling Code	0 to 8191
Details	The scrambling code set here is applied to the scramble of all the channels including CPICH, P-CCPCH, and PICH. Therefore, the primary scrambling code number should be set normally for this setting. The primary scrambling code number is expressed as follows: Primary scrambling code number = 16*i (i = 0 to 511)	

Setting Item	Number of Frames	
Functional Outline	Sets the number of frames to be generated.	
Setting Parameters	Setting Range	
	Number of Frames	1 to the maximum number of frames for the waveform memory
	Auto	Check box selected or cleared.
Details	Refer to Appendix B for the maximum number of frames for the waveform memory When Auto is selected, it automatically calculates the necessary number of frames for waveform generation, and generates the waveform pattern accordingly.	

Setting Item	CPICH	
Functional Outline	Performs settings related to CPICH.	
Setting Parameters	Setting Range	
	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 [dB], setting resolution: 0.01 dB
Details	The channelization code of the CPICH is fixed to 0.	

Setting Item	P-CCPCH	
Functional Outline	Performs settings related to P-CCPCH.	
Setting Parameters	Setting Range	
	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 [dB], setting resolution: 0.01 dB
	P-SCH & S-SCH Power	–40.00 to 0.00 [dB], setting resolution: 0.01 dB
Details	The channelization code of the P-CCPCH is fixed to 1. BCH is mapped for P-CCPCH.	

Setting Item	PICH	
Functional Outline	Performs settings related to PICH.	
Setting Parameters	Setting Range	
	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 [dB], setting resolution: 0.01 dB
	Channelization Code	0 to 255

<table>
<tr><td>Setting Item</td><td colspan="2">DPCH</td></tr>
<tr><td>Functional Outline</td><td colspan="2">Performs settings related to Downlink DPCH.</td></tr>
<tr><td rowspan="4">Setting Parameters</td><td colspan="2">Setting Range</td></tr>
<tr><td>ON/OFF</td><td>ON or OFF</td></tr>
<tr><td>Power</td><td>–40.00 to 0.00 [dB], setting resolution: 0.01 dB</td></tr>
<tr><td>Channelization Code</td><td>0 to SF – 1
SF (spreading factor) varies depending on the setting of Data as follows:
RMC 12.2 kbps = 128
RMC 64 kbps = 32
RMC 144 kbps = 16
RMC 384 kbps = 8
AMR1/AMR2/AMR3 = 128
ISDN = 32
384 kbps Packet = 8
User Edit TrCH = Spreading Factor set in the Channel Edit screen</td></tr>
<tr><td>Data</td><td>RMC 12.2 kbps/RMC 64 kbps/RMC 144 kbps/
RMC 384 kbps/AMR1/AMR2/AMR3/ISDN/
384 kbps Packet/User Edit TrCH</td></tr>
<tr><td>Details</td><td colspan="2">Each channel coding parameter of the DCH is set according to the standard format selected by Data.
RMC 12.2 kbps/RMC 64 kbps/RMC 144 kbps/RMC 384 kbps
Refer to 3GPP TS25.101 Annex A.3 DL reference measurement channel for details of these channels. See the next and subsequent pages for details of each parameter.
AMR1/AMR2/AMR3/ISDN
Refer to 3GPP TR25.944 4.1.1.3 Example for DCH for details of these channels. See the sections below for details of DTCH, DCCH, and Multiplexing.
DTCH
AMR1: 4.1.1.3.1.2 Example for 12.2 kbps data (TFS = #1)
AMR2: 4.1.1.3.1.2 Example for 12.2 kbps data (TFS = #2)
AMR3: 4.1.1.3.1.2 Example for 12.2 kbps data (TFS = #3)
ISDN: 4.1.1.3.1.6 Example for 64 kbps data
DCCH
AMR1/AMR2/AMR3/ISDN: 4.1.1.3.1.1 Example for 3.4 kbps data
Multiplexing
AMR1/AMR2/AMR3: 4.1.1.3.2.2 Example for multiplexing of 12.2 kbps data and 3.4 kbps data
ISDN: 4.1.1.3.2.5 Example for multiplexing of 64 kbps data and 3.4 kbps data

User Edit TrCH
When User Edit TrCH is selected, the settings of parameters for TrCH can be changed on the Channel Edit screen that is opened by clicking the Channel Edit button. Select User Edit TrCH when setting a channel other than the standard transport channels described above.</td></tr>
</table>

♦ DL_RMC_12_2 kbps channel coding parameters

Table 3.1.2-1 DL reference measurement channel 12.2 kbps physical channel parameters

Parameter	Unit	Level
Information bit rate	kbps	12.2
DPCH	ksps	30
Slot Format #i	–	11
TFCI	–	On
Power offsets PO1, PO2 and PO3	dB	0
Puncturing	%	14.7

Table 3.1.2-2 DL reference measurement channel 12.2 kbps transport channel parameters

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	244	100
Transport Block Set Size	244	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Convolution Coding	Convolution Coding
Coding Rate	1/3	1/3
Rate Matching attribute	256	256
Size of CRC	16	12

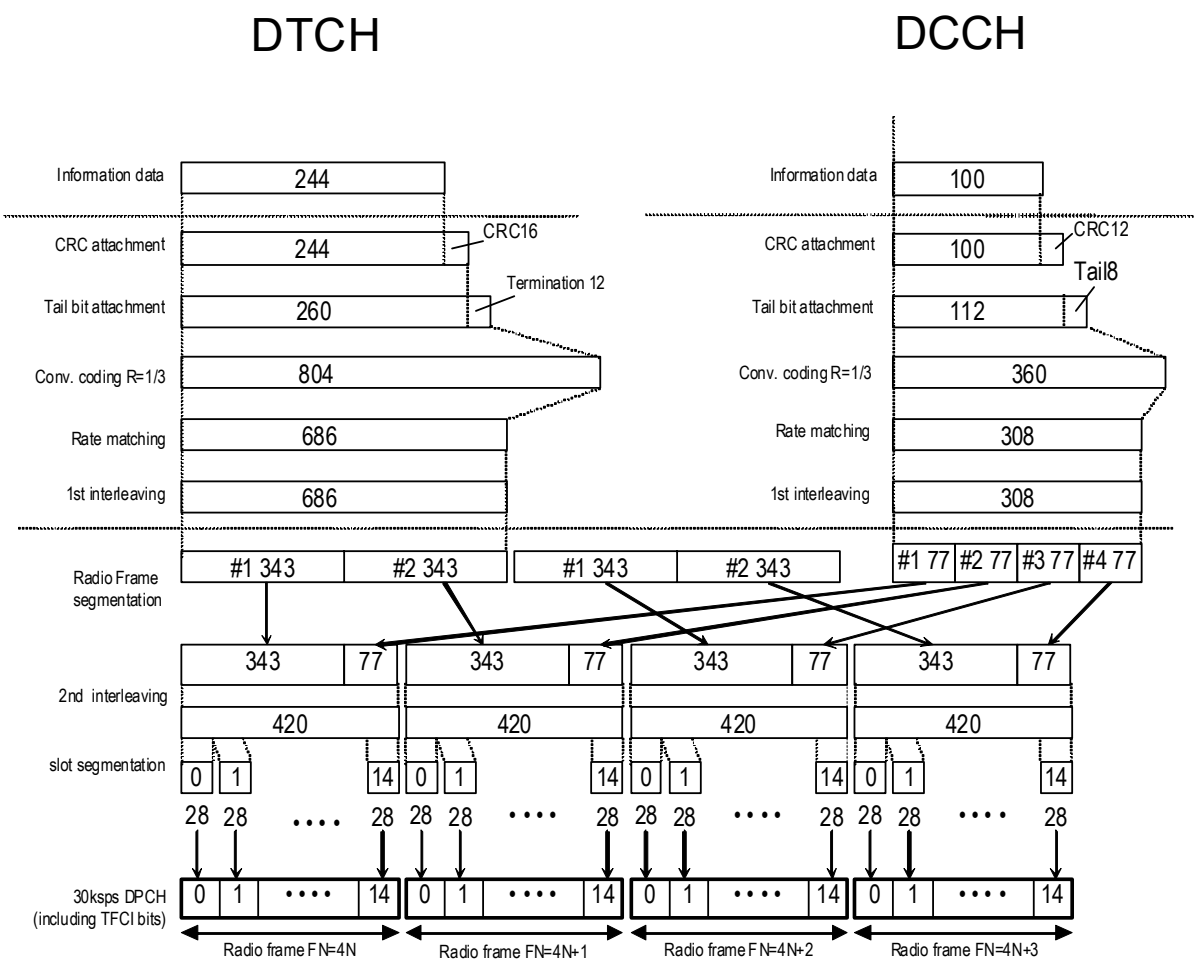


Figure 3.1.2-1 Channel coding for DL reference measurement channel 12.2 kbps

♦ DL_RMC_64 kbps channel coding parameters

Table 3.1.2-3 DL reference measurement channel 64 kbps physical channel parameters

Parameter	Unit	Level
Information bit rate	kbps	64
DPCH	ksps	120
Slot Format #i	–	13
TFCI	–	On
Power offsets PO1, PO2 and PO3	dB	0
Repetition	%	2.9

Table 3.1.2-4 DL reference measurement channel 64 kbps transport channel parameters

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	1280	100
Transport Block Set Size	1280	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
Rate Matching attribute	256	256
Size of CRC	16	12
Position of TrCH in radio frame	fixed	fixed

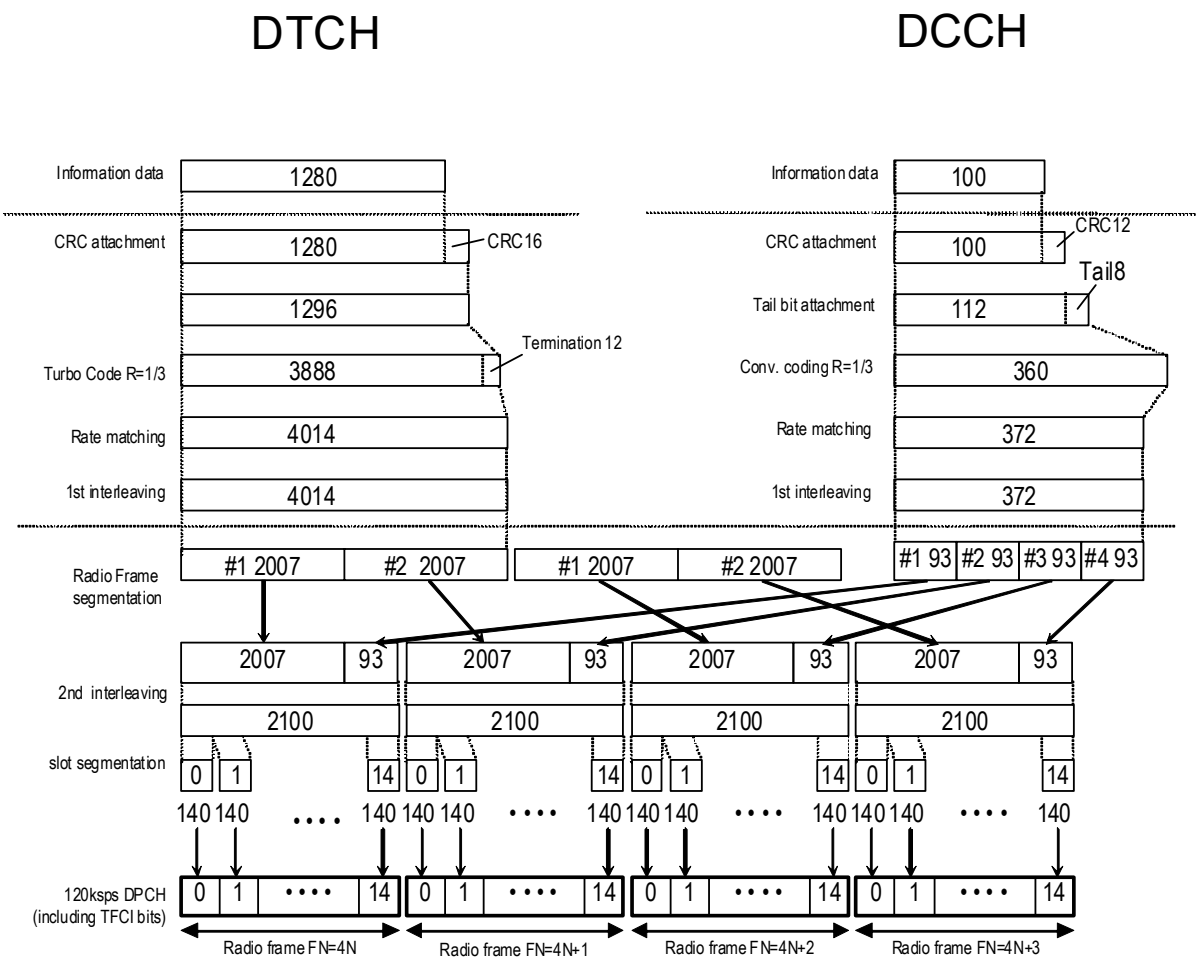


Figure 3.1.2-2 Channel coding for DL reference measurement channel 64 kbps

♦ DL_RMC_144 kbps channel coding parameters

Table 3.1.2-5 DL reference measurement channel 144 kbps physical channel parameters

Parameter	Unit	Level
Information bit rate	kbps	144
DPCH	ksps	240
Slot Format #i	–	14
TFCI	–	On
Power offsets PO1, PO2 and PO3	dB	0
Puncturing	%	2.7

Table 3.1.2-6 DL reference measurement channel 144 kbps transport channel parameters

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	2280	100
Transport Block Set Size	2280	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
Rate Matching attribute	256	256
Size of CRC	16	12
Position of TrCH in radio frame	fixed	fixed

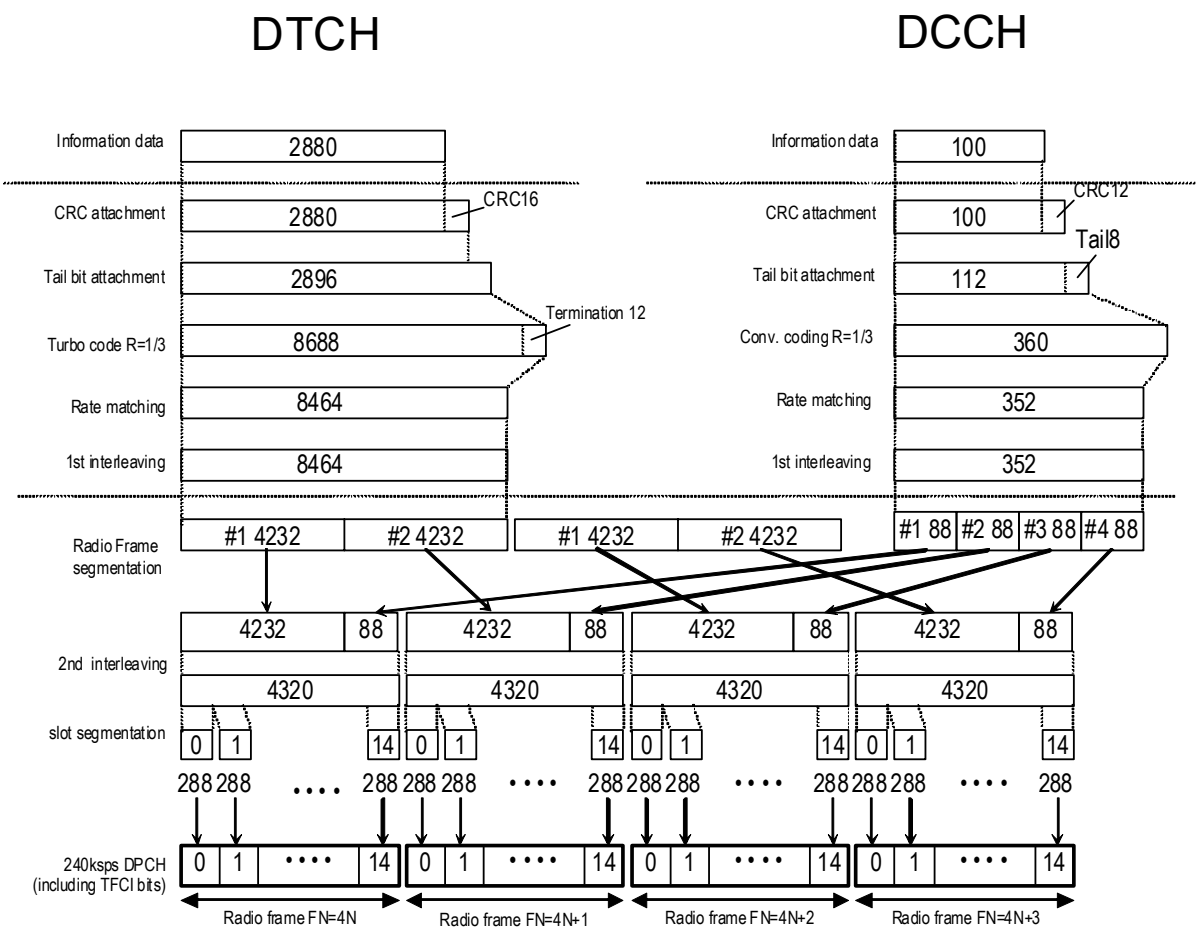


Figure 3.1.2-3 Channel coding for DL reference measurement channel 144 kbps

♦ DL_RMC_384 kbps channel coding parameters

Table 3.1.2-7 DL reference measurement channel 384 kbps physical channel parameters

Parameter	Unit	Level
Information bit rate	kbps	384
DPCH	ksps	480
Slot Format #i	–	15
TFCI	–	On
Power offsets PO1, PO2 and PO3	dB	0
Puncturing	%	22

Table 3.1.2-8 DL reference measurement channel 384 kbps transport channel parameters

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	3840	100
Transport Block Set Size	3840	100
Transmission Time Interval	10 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
Rate Matching attribute	256	256
Size of CRC	16	12
Position of TrCH in radio frame	fixed	fixed

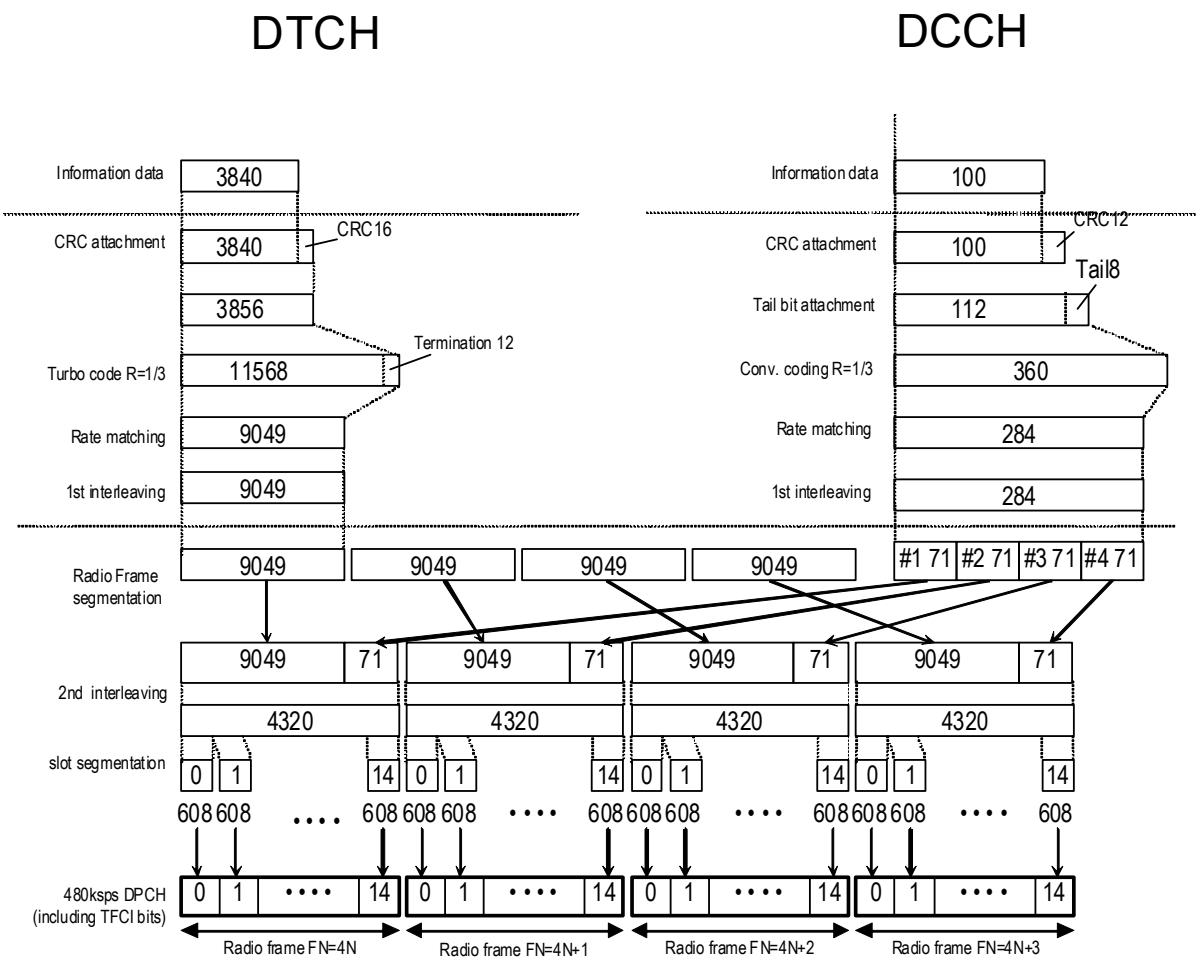


Figure 3.1.2-4 Channel coding for DL reference measurement channel 384 kbps

<table>
<tr><td>Setting Item</td><td colspan="2">OCNS</td></tr>
<tr><td>Functional Outline</td><td colspan="2">Sets OCNS ON/OFF.</td></tr>
<tr><td rowspan="3">Setting Parameters</td><td colspan="2">Setting Range</td></tr>
<tr><td>ON/OFF</td><td>ON or OFF</td></tr>
<tr><td>Type</td><td>16 Codes/6 Codes(ch=122-127)/6 Codes(ch=2-7)</td></tr>
<tr><td>Details</td><td colspan="2">When OCNS is set to ON, the power of OCNS (Orthogonal Channel Noise Simulator) is adjusted so that the total power of all the channels that are set to ON becomes 0 dB.
Since the OCNS power is calculated from the total power of all the channels that are set to ON, if a channel that includes DTX (Discontinuous Transmission) is used, the average power within the time when all the channels are output becomes 0 dB. When a channel that includes DTX is used, therefore, the average power value obtained by measuring the RF output level with a power meter does not match the setting level of the MS2690A/MS2691A/MS2692A or MS2830A.

When the total power of all the channels that are set to ON (excluding OCNS) exceeds 0 dB while OCNS is set to ON, an error occurs and data generation is cancelled. The total power of all the channels that are set to ON (excluding OCNS) is displayed in Total Power on the screen.

To clear this error, set OCNS to OFF or attenuate the power of each channel. For example, when P-CCPCH, CPICH, and DPCH are set as follows, the total power of the channels except OCNS exceeds 0 dB. OCNS cannot be set to ON in this event, and it is regarded as an error.
An error may occur when the actual total power exceeds 0 dB at the thousandth or later places that are not displayed, even if 0.00 dB is displayed in Total Power on the screen.

P-CCPCH = –3.00 dB
CPICH = –3.00 dB
DPCH = –3.00 dB
OCNS = ?
} Total > 0.0 dB

When OCNS is set to OFF, click the Normalize Power button to adjust the power of each channel so that the total power of all the channels becomes 0 dB while retaining the power ratio between channels.

P-CCPCH = –3.00 dB
CPICH = –3.00 dB
DPCH = –3.00 dB
Normalize
P-CCPCH = –4.80 dB
CPICH = –4.80 dB
DPCH = –4.80 dB</td></tr>
</table>

Details (Cont'd)

OCNS consists of 6-channel (for HSDPA) or 16-channel (for Performance requirement) DPCH. The tables below show the parameters. Refer to 3GPP TS25.101 (Release 6) C5.2 "OCNS Definition" Tables C.6 and C.12 for details.

OCNS (6 channels, ch2 to 7)

Channelization Code at SF = 128	Relative Level Setting (dB)
2	0
3	–2
4	–2
5	–4
6	–1
7	–3

OCNS (6 channels, ch122 to 127, TS25.101 V5.12.0 or later)

Channelization Code at SF = 128	Relative Level Setting (dB)
122	0
123	–2
124	–2
125	–4
126	–1
127	–3

Details (Cont'd)

OCNS (16 channels)

Channelization Code at SF = 128	Relative Level Setting (dB)
2	–1
11	–3
17	–3
23	–5
31	–2
38	–4
47	–8
55	–7
62	–4
69	–6
78	–5
85	–9
94	–10
125	–8
113	–6
119	0

[Displayed contents]

An **OCNS** item **Power** displays the power of OCNS only. The total of this value and the value displayed in **Total Power** is always 0 dB.
The Channelization Code and SF (spreading factor) used by OCNS are also displayed.

Setting Item	HS-SCCH1, HS-SCCH2, HS-SCCH3, HS-SCCH4	
Functional Outline	Sets the physical parameters of HS-SCCH.	
Setting Parameters	Setting Range	
	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 [dB], setting resolution: 0.01 dB
	Channelization Code	0 to 127
	Data	PN9/PN9fix/PN15fix/16bitRepeat/Coded
Details	**ON/OFF** Toggles the HSDPA channel ON/OFF. This setting is commonly applied to HS-PDSCH1 to 4 that correspond to HS-SCCH1 to 4, respectively. When **HS-SCCH1** is set to **OFF**, for example, **HS-PDSCH1** is also set to **OFF**. **Data** This setting indicates the type of data sequence to be inserted to the subframes of HS-SCCH1 to 4. **PN9fix** and **PN15fix** are PN9/PN15 data reset by each subframe. PN data is not continuous between subframes. Select **Coded** when transmitting control data related to HSDPA on the HS-SCCH.	

Setting Item	HS-PDSCH1, HS-PDSCH2, HS-PDSCH3, HS-PDSCH4	
Functional Outline	Sets the physical parameters of HS-PDSCH.	
Setting Parameters	Setting Range	
	ON/OFF	ON or OFF
	Power	–40.00 to 0.00 [dB], setting resolution: 0.01 dB
	Channelization Code	Displays Channelization Code.
	Data	PN9/PN9fix/PN15fix/16bitRepeat/HS-DSCH
Details	**ON/OFF** Toggles the HSDPA channel ON/OFF. This setting is commonly applied to HS-SCCH1 to 4 that correspond to HS-PDSCH1 to 4, respectively. When **HS-PDSCH1** is set to **OFF**, for example, **HS-SCCH1** is also set to **OFF**. **Data** This setting indicates the type of data sequence to be inserted to the subframes of HS-PDSCH1 to 4. **PN9fix** and **PN15fix** are PN9/PN15 data reset by each subframe. PN data is not continuous between subframes. Select **HS-DSCH** when mapping the data sequence that was channel-coded according to 3GPP TS25.212 (Release 6) to HS-PDSCH.	

3.1.3 Details of setting parameters on Channel Edit screen

When the **Channel Edit** button is clicked, the Channel Edit screen shown below is displayed. This section describes the details of the setting items on this screen.

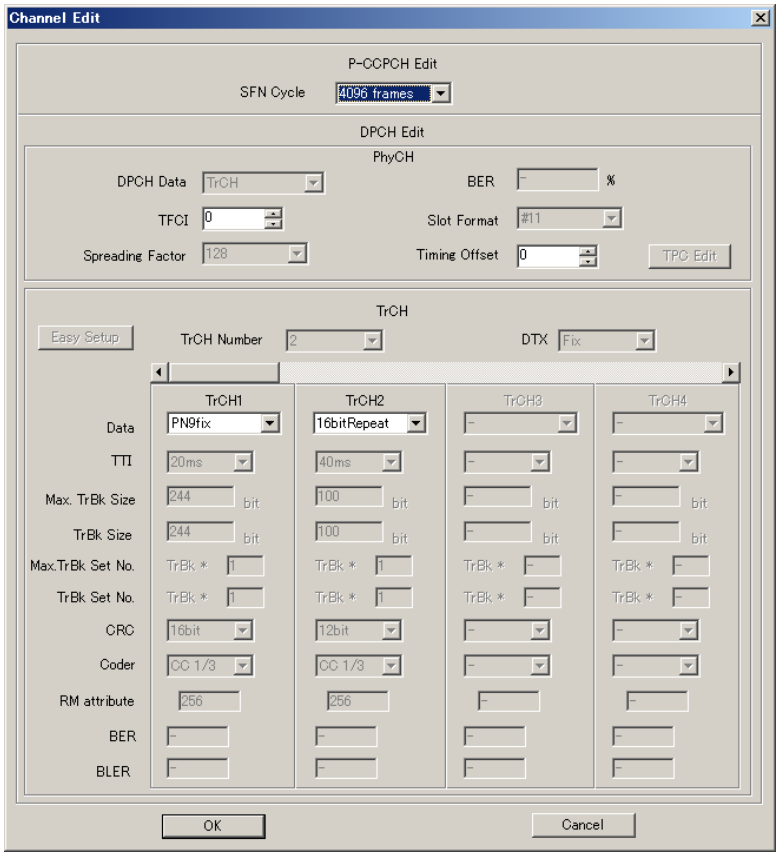


Figure 3.1.3-1 Channel Edit screen

■ OK and Cancel buttons

The **OK** and **Cancel** buttons are provided to close the Channel Edit screen after performing setting.

- When the **OK** button is clicked:
  The Channel Edit screen is closed, applying the settings.
- When the **Cancel** button is clicked:
  The Channel Edit screen is closed, ignoring the settings.

Setting Item	P-CCPCH Edit	
Functional Outline	Performs settings for P-CCPCH.	
Setting Parameters	Setting Range	
	SFN Cycle	Short or 4096
Details	This is the cycle of SFN (System Frame Number) that is transmitted by BCH mapped to P-CCPCH. When set to **Short**, the cycle of SFN becomes a common multiple of the maximum TTI cycle. This will shorten the calculation time and lessen the data volume and number of frames to be generated. If the normal cycle of 4096 is required, set to **4096**.	

Setting Item	DPCH Edit (PhyCH)	
Functional Outline	Performs settings for DL-DPCH physical channels.	
Setting Parameters	Setting Range	
	DPCH Data	PN9/PN9fix/PN15fix/16 bitRepeat/TrCH
	TFCI	0 to 1023
	Spreading Factor	4, 8, 16, 32, 64, 128, 256, 512
	BER	0.0 to 100.0%, setting resolution: 0.1%
	Slot Format	#0 to #16
	Timing Offset	0 to 149
	TPC Edit	0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 to 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111
Details	**DPCH Data** Selects the data to be inserted to DPCH of the physical channel. **PN9fix/PN15fix** is PN9/PN15 data reset by each frame. PN data is not continuous between frames. When performing operations such as BER (Bit Error Rate) measurement for a reception sensitive test, select **PN9** with which PN data is continuous between frames. When **[PN9fix**, **PN15fix**, or **PN9** is selected, a physical frame structure is not configured since PN data is mapped to all areas of DPDCH and DPCCH in this event. **PN9** can be set only when all four HSDPA channels are set to **OFF**. When **TrCH** is selected, a physical frame structure is configured for DPDCH and DPCCH, and the data for which DCH frame coding is executed is inserted to DPDCH. **Slot Format, TPC Edit** These can be set only when **DPCH Data** is set to **TrCH**. **BER** Sets the error rate to be inserted to the transmission data. This setting is valid when **DPCH Data** is set to **PN9**. When **DPCH Data** is set to **PN9**, an error is randomly inserted to the PN9 data that is inserted directly to a physical frame. **Timing Offset** Sets an offset for the DPCH frame timing for P-CCPCH with a value of 256 chip multiplied by n. **TPC Edit** Sets the data to be inserted to the TPC bit in a 4-frame cycle. Each bit indicates the symbol (0/1) of the TPC bit to be assigned to each slot. Data is assigned to each slot sequentially from the left.	

Setting Item	DPCH Edit (TrCh Edit)	
Functional Outline	Performs settings for TrCH.	
Setting Parameters	Setting Range	
	TrCH Number	1 to 8
	DTX	Fix/Flex
	Data	PN9/PN9fix/PN15fix/16 bit Repeat/User File
	TTI	10, 20, 40, 80 ms
	Max. TrBk Size	0 to 5000
	TrBk Size	0 to 5000
	Max. TrBk Set No.	0 to 64
	TrBk Set No.	0 to 64
	CRC	0, 8, 12, 16, 24 bits
	Coder	CC1/2, CC1/3, TC
	RM attribute	1 to 256
	BER	0.0 to 100.0%, setting resolution: 0.1%
	BLER	0 to 100%, setting resolution: 1%
Details	**TrCH Number** Sets the number of TrCH (transport channels). The number of TrCh that can be edited varies depending on this setting. **Data** Selects the data to be inserted to Information Data of the transport channel. **PN9fix/PN15fix** is PN9/PN15 data reset at the last data of a signal. The last data of a signal and the first data of the next signal are not continuous. **PN9** can be set only when all four HSDPA channels are set to **OFF**. **Max. TrBk Size**, **Max. TrBk Set No.** Sets the maximum TrBk Size and the number of TrBk Sets in TFCS. **Coder** Selects the channel coding type. CC1/2 and CC1/3 indicate a convolutional code at coding rates of 1/2 and 1/3 respectively. TC indicates a turbo code. **BER** This setting is valid when **Data** is set to **PN9**. The bits in the information data to be inserted to the transport channel are randomly inverted according to the specified error rate. **BLER** This setting is valid when **Data** is set to **PN9**. Half of the bits in the CRC to be added to each transport block are inverted randomly according to the specified error rate.	

3.1.4 Details of setting parameters on HSDPA Edit screen

When the **Edit** button is clicked, the HSDPA Edit (Ch1 to Ch4) screen shown below is displayed. This section describes the details of the setting items on this screen.

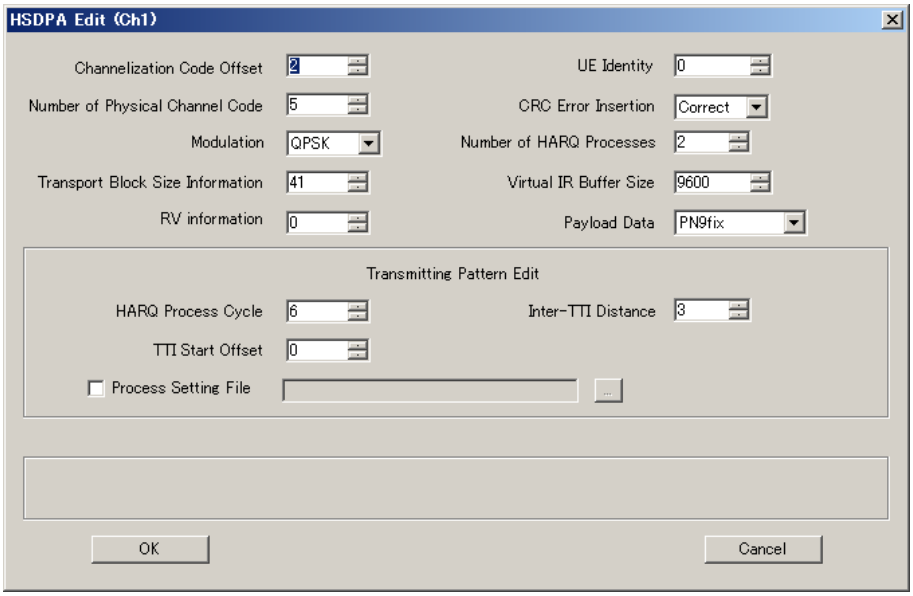


Figure 3.1.4-1 HSDPA Edit screen

■ OK and Cancel buttons

The **OK** and **Cancel** buttons are provided to close the HSDPA Edit screen after performing setting.

- When the **OK** button is clicked:
  The HSDPA Edit screen is closed, applying the settings.
- When the **Cancel** button is clicked:
  The HSDPA Edit screen is closed, ignoring the settings.

Setting Item	HSDPA transport channel parameter	
Functional Outline	Sets the parameters for HS-SCCH and HS-PDSCH.	
Setting Parameters	Setting Range	
	Channelization Code Offset	1 to (16 – Number of Physical Channel Code)
	Number of Physical Channel Code	1 to (16 – Channelization Code Offset)
	Modulation	QPSK or 16QAM
	Transport Block Size Information	0 to 63
	RV Information	0 to 7
	UE Identity	0 to 65535
	CRC Error Insertion	Correct or Fail
	Number of HARQ Processes	0 to 8
	Virtual IR Buffer Size	800 to 304000
	Payload Data	PN9/PN9fix/PN15fix/16 bitRepeat
Details	[Channelization Code Offset, Number of Physical Channel Code, Modulation, Transport Block Size Information, RV Information, UE Identity] When **Coded** is set for **Data** of HS-SCCH or **HS-DSCH** is set for **Data** of HS-PDSCH on the main screen, the data for which channel coding is performed according to these settings is assigned to HS-SCCH or HS-PDSCH. [Channelization Code Offset, Number of Physical Channel Code] These settings are transmitted on HS-SCCH as "channelization code set-bits." **Code Offset** indicates the start number of each channelization code of HS-PDSCH. **Number of Physical Channel Code** indicates the number of HS-PDSCH codes. These settings have an effect on their setting range each other, as described above. [CRC Error Insertion] Because the CRC bits of all the transport blocks are inverted when **Fail** is selected, an error occurs for a CRC check at reception. [Number of HARQ Processes] Indicates the number of HARQ processes. Refer to the description of the "Transmitting Pattern Edit" setting item for details. [Payload Data] Selects the data to be used for HS-DSCH. **PN9fix/PN15fix** is PN9/PN15 data reset by each HARQ process. PN data is not continuous between HARQ processes. When any HSDPA channel is set to **ON**, **PN9** cannot be selected for **DTCH Information Data**. If any HSDPA channel is changed to **ON** while **PN9** is set for **DTCH Information Data**, **DTCH Information Data** is changed to **PN9fix**.	

<table>
<tr><td>Setting Item</td><td colspan="2">Transmitting Pattern Edit</td></tr>
<tr><td>Functional Outline</td><td colspan="2">Sets the HARQ process output pattern.</td></tr>
<tr><td rowspan="5">Setting Parameters</td><td colspan="2">Setting Range</td></tr>
<tr><td>HARQ Process Cycle</td><td>1 to 16 (1 to 6 when PN9 is set for Payload Data)</td></tr>
<tr><td>Inter-TTI Distance</td><td>1 to 8</td></tr>
<tr><td>TTI Start Offset</td><td>0 to 7</td></tr>
<tr><td>Process Setting File</td><td>Use or Not use</td></tr>
<tr><td>Details</td><td colspan="2">[HARQ Process Cycle]
Sets the repetition cycle of the HARQ Process set by Number of HARQ Processes in the subframe (2 ms) units.

[Inter-TTI Distance]
Sets the interval between HARQ Processes by in the subframe (2 ms) units. Note, however, that the TTI between the HARQ process cycles does not match this setting value if Inter-TTI Distance × Number of HARQ Processes does not equal to the value of HARQ Process Cycle.

[TTI Start Offset]
The HARQ process start timing is delayed by this setting in subframe units. When two or more HSDPA channels are set to ON and their HARQ Process Cycles are same, the output timing of each HSDPA channel can be delayed by using this setting.

[Process Setting File]
When this check box is selected, the “Open file” screen is displayed to select a process setting file to be read for setting the transmission pattern of HS-SCCH and/or HS-PDSCH. The HARQ Process is set based on the settings in the process setting file selected in this screen.
When the process setting file is selected, the settings of HARQ Process Cycle, Inter-TTI Distance, and TTI Start Offset are invalid.

A process setting file should a text file with the extension “.txt,” and should be created in the format as shown below:

#MX269901A HSDPA IQproducer Process Setting File
Process Cycle = 6 frame
01020
30405
06070
80102
:</td></tr>
</table>

Details (Cont'd)	There are the following restrictions on process setting files: (1) Process cycle: 1 to 512 frames (2) HARQ process number: 0, 1, 2, …, 8 (0 indicates DTX.) (3) Although each line is fed by 5 characters (5 subframes = 1 frame) in the example above, commas (,), periods (.), spaces, and line feed characters are ignored. (4) If **Payload Data** = PN9 and **Process Cycle** ≥ 7, the data length is greater than the waveform memory capacity of the mainframe, resulting in an error. Set **Payload Data** to other than **PN9**. (5) When the same process number appears, it is regarded as a new HARQ process and the NDI (New Data Indicator) bit in HS-SCCH is automatically changed from 0 to 1 or from 1 to 0. The NDI bit is set to 0 at the beginning of the waveform pattern in all HARQ process cycles.

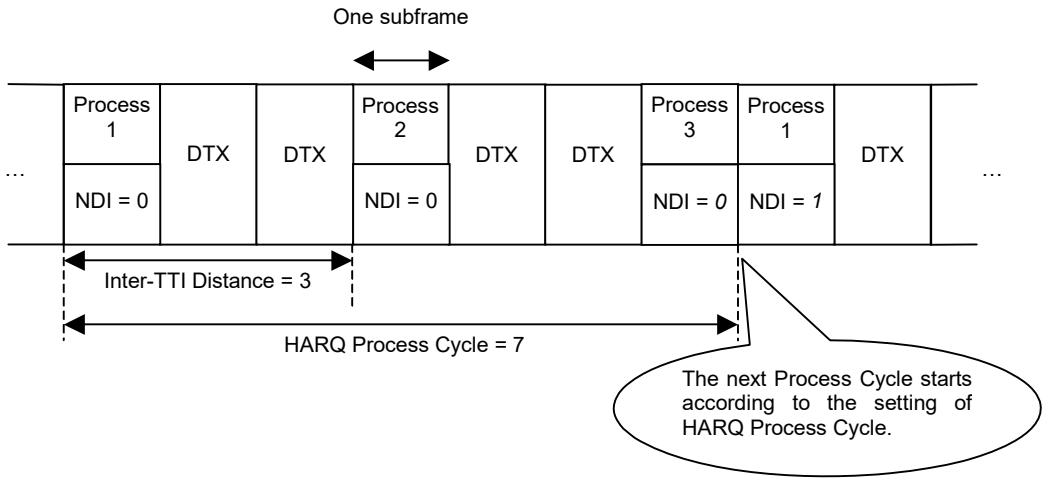


Figure 3.1.4-2 HARQ Process Cycle

3.1.5 Calculation screen

Clicking **Calculation & Load**, **Calculation & Play**, or the **OK** button on the Export File name Input screen box 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 the **Cancel** button. When cancelled, it returns to the main screen.

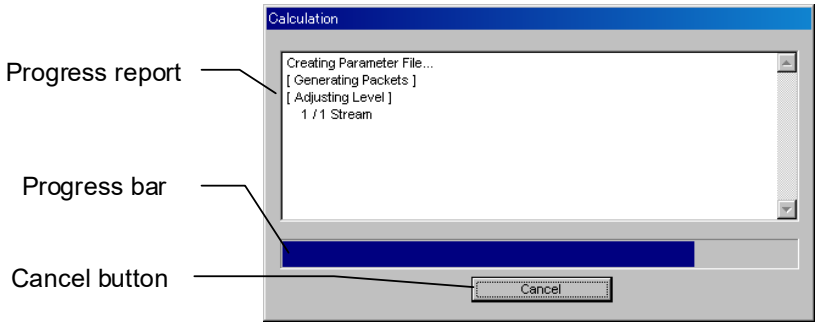


Figure 3.1.5-1 Calculation Screen (In Progress)

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.

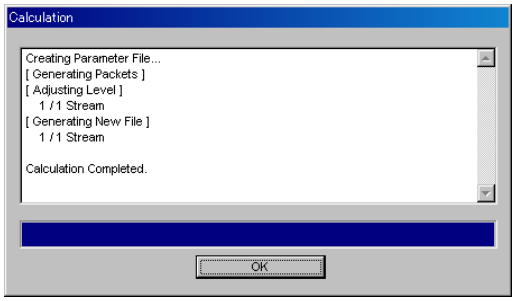


Figure 3.1.5-2 Calculation Screen (Completed)

Note:

When using this software on MG3710A, and selecting **Calculation & Load** or **Calculation & Play**, the waveform generation ends without displaying the above screen.

3.1.6 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.

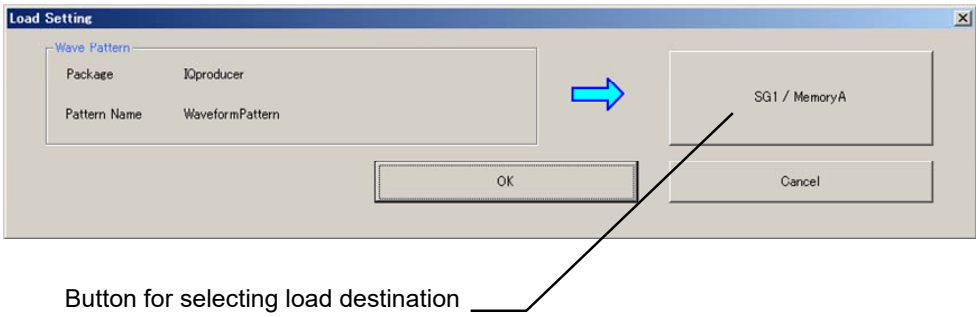


Figure 3.1.6-1 Load Setting Screen

The Select Memory screen will display after clicking the load destination in the Load Setting screen.

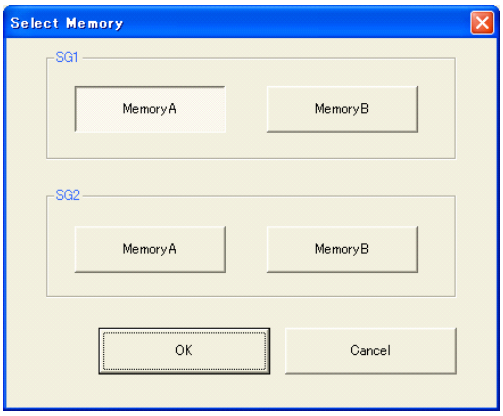


Figure 3.1.6-2 Select Memory Screen

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.

Notes:

- To exit this screen without loading the waveform pattern, click the **Cancel** button in the Load Setting screen.

- If the configuration of generated waveform pattern used two memories, the Select SG screen displays just like Calculation & Play.

3.1.7 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.

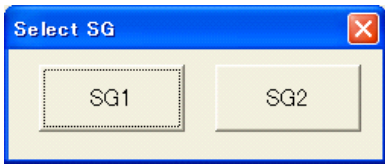


Figure 3.1.7-1 Select SG Screen

3.1.8 Saving/reading parameters

This numeric values and settings for each item can be saved in a parameter file by using this software.

■ Saving 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 shown below.
2. Enter a file name in the **File name** text box and click the **Save** button to save the parameter file.
   When the save destination is not changed in the **Save in** box, the parameter file is saved in the following directory with the entered file name:
   X:\IQproducer\HSDPA*Entered file name*.prm
   ("X:\IQproducer" indicates the folder where the IQproducer™ is installed.)

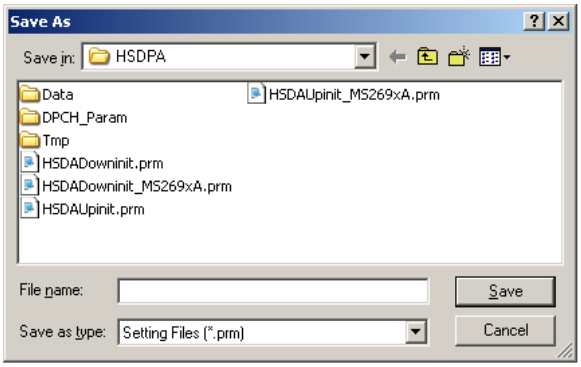


Figure 3.1.8-1 Parameter file saving screen

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.

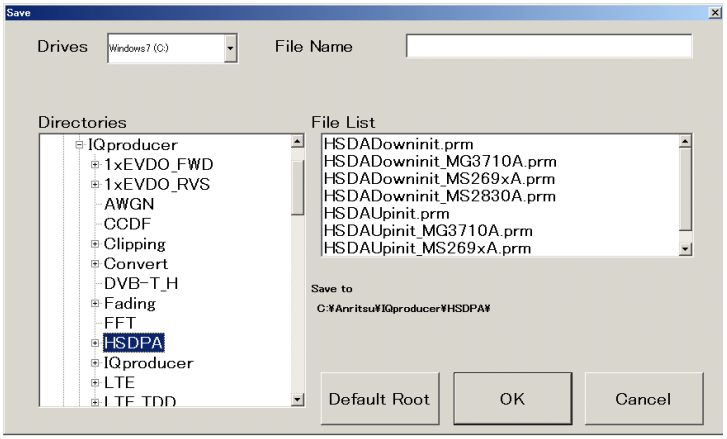


Figure 3.1.8-2 Parameter file saving screen (MG3710A)

(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.

■ Reading 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 shown.
2. Select a parameter file to be read from the file list, and then click the **Open** button to read the selected parameter file.

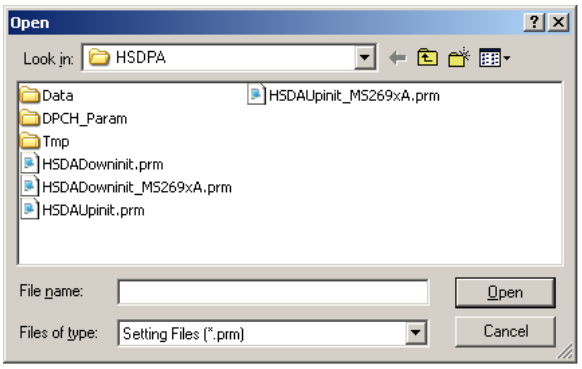


Figure 3.1.8-3 Parameter file reading screen

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.

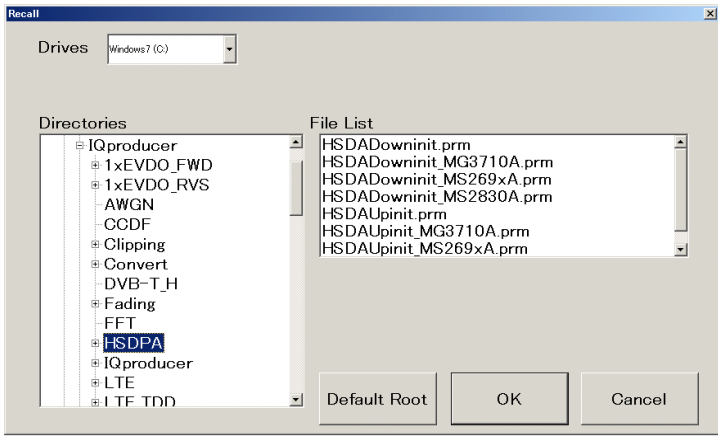


Figure 3.1.8-4 Parameter file reading screen (MG3710A)

(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.

3.1.9 Generating waveform pattern file

A waveform pattern file to be used in the mainframe can be generated based on the setting values. In the screen shown in Figure 3.1.9-2, the waveform pattern name and comments can be entered and whether to enable or disable the RRC filter can be set.
The number of frames to be generated varies depending on the setting conditions for each channel, and the time required for generating a waveform pattern also varies accordingly.

<Procedure>

1. Select **Calculate Waveform Pattern** from the **Edit** menu or click the  tool button.

At this time, the Warning message shown below appears when **OCNS** is set to **OFF** and the value of **Total Power** is out of ±0.01 dB.

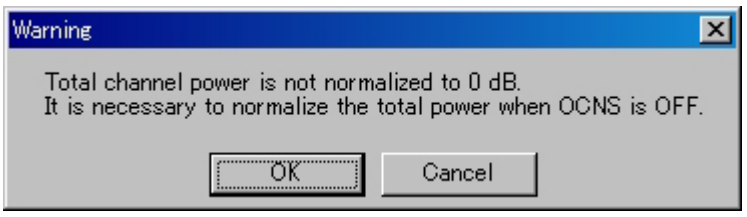


Figure 3.1.9-1 Warning message

Click the **OK** button to normalize the **Total Power** and proceed with the next step.

2. The file name input screen is displayed.

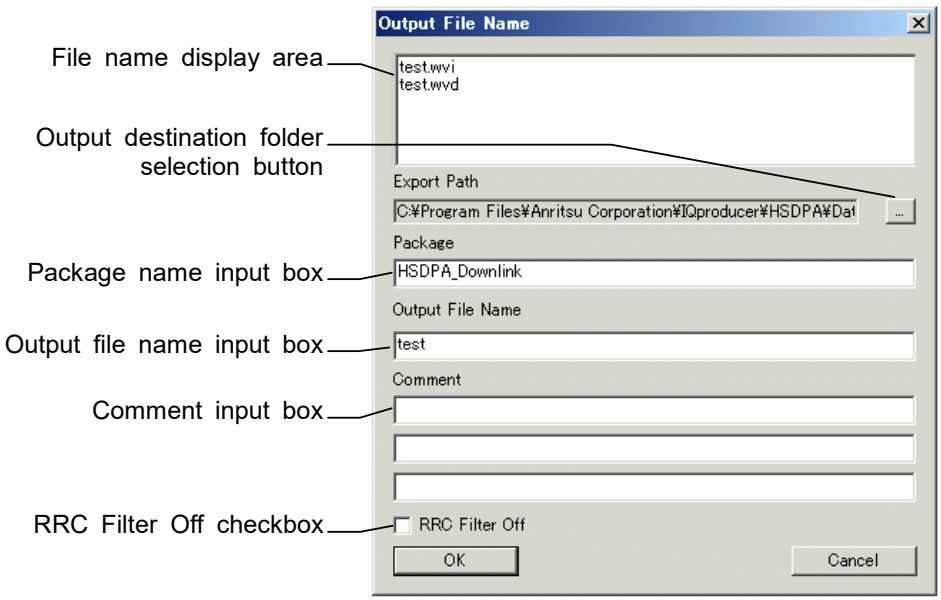


Figure 3.1.9-2 File name input screen

Enter a package name in the package name input box, up to 31 characters.
Enter a file name in the file name input box, up to 18 characters.
1-byte alphanumeric characters and the following symbols can be used for a file name:
! % & ( ) + = ` { } _ - ^ @ [ ]

When a file name is entered, the file to be generated is displayed in the file name display area in the following format:

File name format:

test.wvi
- Extension: wvi… Information file (text format)
  wvd… Data file (binary format)
- Entered file name

Enter a comment for the waveform pattern in a comment input box.
Three comment input boxes are provided, and a comment can be entered in each line within 38 characters.
1-byte alphanumeric characters and symbols can be used for comments.

The contents of each comment are displayed on the screen when the corresponding waveform pattern is selected by the Vector Signal Generator. Leave the comment boxes blank if not necessary.

When the RRC Filter Off check box is selected, symbol data that does not pass through the RRC filter is generated as a waveform pattern. This check box needs not be selected under normal conditions.

3. Click **OK** on the Export File screen. The Calculation screen shown in Figure 3.1.5-1 is displayed and waveform pattern generation starts (the output destination folder, 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 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, Windows 10, Windows 11	C:\Anritsu\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, clicking the output destination selection button displays the Browse for Folder screen shown in Figure 3.1.9-3. The output destination folder can be selected from this screen.

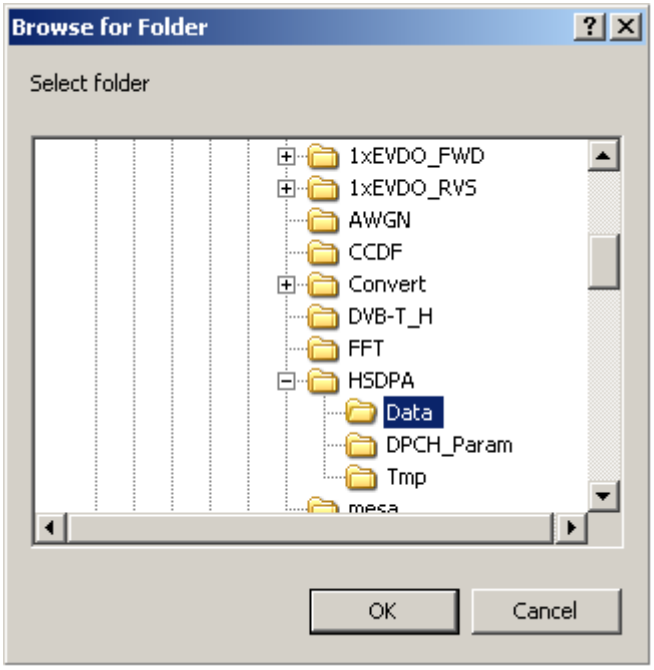


Figure 3.1.9-3 Browse for Folder screen

If no destination folder is selected, the file is generated in the following folder.
X:\IQproducer\HSDPA\Data
(Where "X:\IQproducer" is the folder you installed IQproducer™).

Note:

The HSDPA/HSUPA Uplink IQproducer waveform pattern file generation and the HSDPA/HSUPA Downlink IQproducer waveform pattern file generation must be operated exclusively. An error dialog box will be displayed if the HSDPA/HSUPA Uplink IQproducer waveform pattern file generation is started while the HSDPA/HSUPA Downlink IQproducer waveform pattern file generation is operating, and vice versa. To start the HSDPA/HSUPA Uplink/Downlink IQproducer waveform pattern file generation while the other is operating, cancel the other file generation or wait until the other file generation is completed.

3.1.10 Auxiliary signal output

When a waveform pattern generated by this software is selected by the mainframe, a marker signal synchronized with the RF signal is output from the AUX input/output connector of the rear panel as an auxiliary signal. TTI Pulse (Connector 1) is output.

- TTI Pulse
  TTI cycle pulse synchronized with the symbol at the beginning of the frame is output from Connector 1. The signal polarity can be changed by changing the polarity of Marker 1.

3.2 Uplink Setup Screen

3.2.1 Main screen

On common platform screen, click the **System (Cellular)** tab, and then click **HSDPA/HSUPA Uplink** to display the main screen.

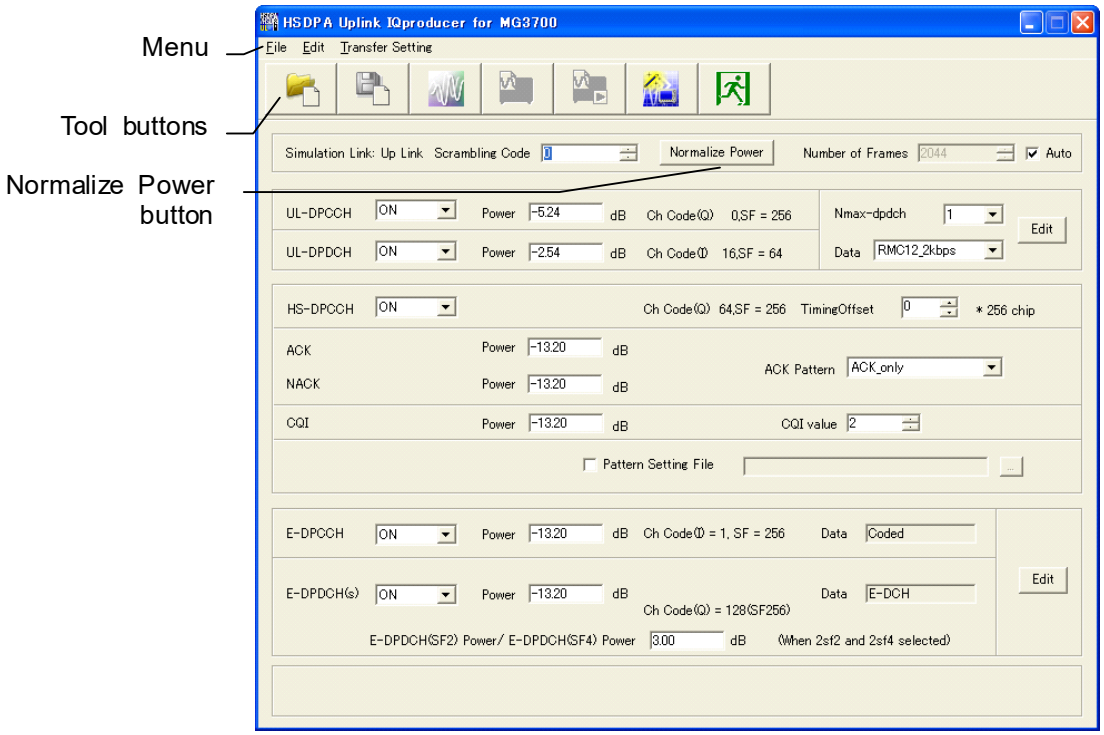


Figure 3.2.1-1 Uplink main screen

■ **File** menu

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

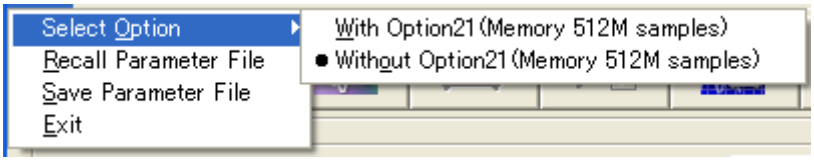


Figure 3.2.1-2 File menu

- **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 3.2.1-1 Available Options for MG3700A or MS2830A

Model	Items	ARB Memory Expansion
MG3700A	With Option21 (Memory 512M samples)	1 GB × 2 Memories
	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 3.2.1-2 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 3.2.1-3 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**
  Sets the HSDPA/HSUPA Uplink parameters according to the setting of the parameter files saved by Save Parameter File.

- **Save Parameter File**
  Saves the HSDPA/HSUPA Uplink setting parameters to a file.

- **Exit**
  Exits the HSDPA/HSUPA Uplink IQproducer™.

■ **Edit** menu

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

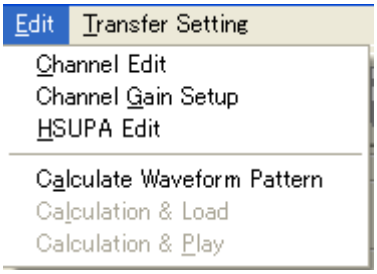


Figure 3.2.1-3 Screen when Edit is selected

- **Channel Edit**
  Displays the Channel Edit screen in which the DPCH parameters are set. This is the same operation as that which occurs when **Edit** in the upper right part of the screen is clicked.

- **Channel Gain Setup**
  Displays the Channel Gain Setup screen in which the power of each channel can be set using βc, βd, and other parameters. The setting of Power in the main screen is changed in accordance with the channel power set in this screen.

- **HSUPA Edit**
  Displays the HSUPA Edit screen in which the HSUPA parameters are set. This is the same operation as that which occurs when **Edit** in the lower right part of the screen is clicked.

- **Calculate Waveform Pattern**
  Starts waveform pattern generation based on the settings on the screen.
  The number of frames to be generated varies depending on the setting conditions for each channel, and the time required for generating a waveform pattern also varies accordingly.
  The number of frames to be generated is displayed on the calculation progress screen.
  Refer to Appendix B "Number of Frames to Be Generated" for details on the number of frames to be generated in accordance with the Uplink setting conditions.

- **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.

■ **Transfer Setting** menu

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

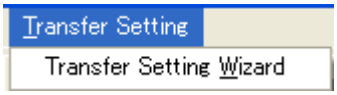


Figure 3.2.1-4 Transfer Setting menu

- **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.

■ **Tool buttons**

The following tool buttons are provided.

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

 Calculate Waveform Pattern

 Calculation & Load

 Calculation & Play

 Transfer & Setting Wizard

 Exit

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

■ Normalize Power button

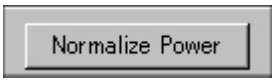


Figure 3.2.1-5 Normalize Power button

When this button is clicked, Total Power is subtracted from the power of each channel that is set to ON. As a result, the total power is normalized to 0 dB while retaining the power ratio of the channels that are set to ON.
Since normalization is automatically executed if necessary at the start of waveform pattern generation, it is not always required to execute normalization manually by clicking the **Normalize Power** button. This button may be used for pre-check before waveform pattern generation.
For normalization of HS-DPCCH, the greatest from among the ACK power, NACK power, and CQI power is used for calculation. Therefore, the average power value obtained by measuring the RF output level with a power meter does not match the setting level of the MS2690A/MS2691A/MS2692A or MS2830A unless the ACK_power, NACK_power, and CQI_power for HS-DPCCH are the same and do not include DTX (see Figure 3.2.1-6).
For E-DPDCH(s), the power can be set for each E-DCH TTI, using an HARQ process setting file. Refer to the descriptions of E-DPCCH and E-DPDCH in Section 3.2. “Uplink Setup Screen” and see Figure 3.2.1- for details on the power of E-DPDCH(s) for each E-DCH TTI.

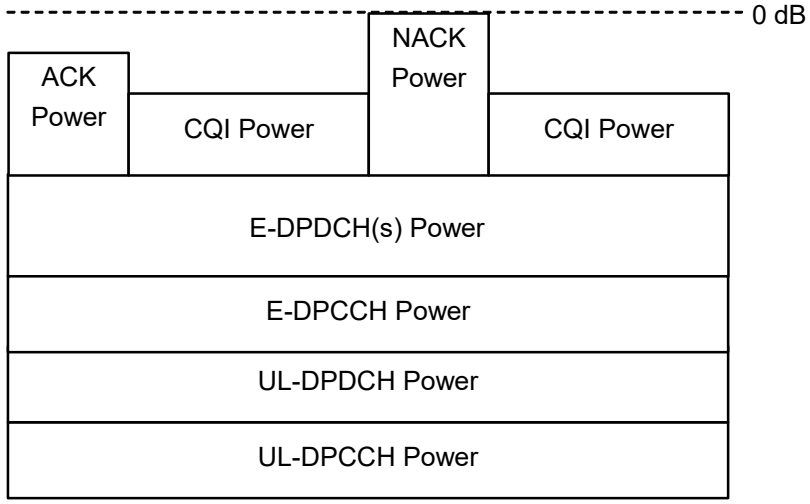


Figure 3.2.1-6 Channel powers and RF output level after normalization when HS-DPCCH level is variable

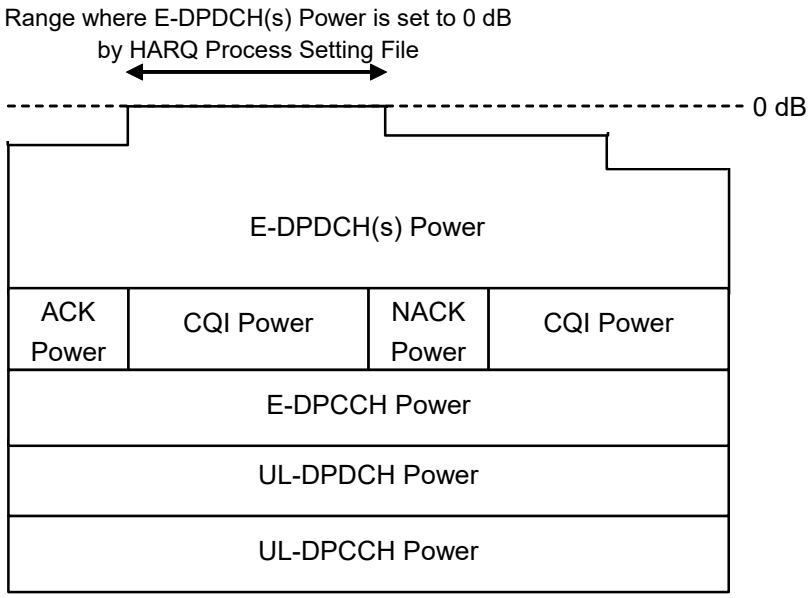


Figure 3.2.1-7 Channel powers and RF output level after normalization when E-DPDCH(s) level is variable

3.2.2 Details of setting parameters on main screen

Setting Item	Scrambling Code
Functional Outline	Sets the scrambling code.
Setting Parameters	Setting Range
	0 to 16777215

Setting Item	Number of Frames	
Functional Outline	Sets the number of frames to be generated.	
Setting Parameters	Setting Range	
	Number of Frames	1 to the maximum number of frames for the waveform memory
	Auto	Check box selected or cleared.
Details	Refer to Appendix B for the maximum number of frames for the waveform memory When Auto is selected, it automatically calculates the necessary number of frames for waveform generation, and generates the waveform pattern accordingly.	

<table>
<tr><td>Setting Item</td><td colspan="2">UL-DPCCH, UL-DPDCH</td></tr>
<tr><td>Functional Outline</td><td colspan="2">Performs settings for DPCCH and DPDCH.</td></tr>
<tr><td rowspan="5">Setting Parameters</td><td colspan="2">Setting Range</td></tr>
<tr><td>Channel ON/OFF</td><td>ON or OFF</td></tr>
<tr><td>Power</td><td>–40.00 to 0 [dB], setting resolution: 0.01 dB</td></tr>
<tr><td>Data</td><td>RMC 12.2 kbps/RMC 64 kbps/RMC 144 kbps/
RMC 384 kbps/AMR1/AMR2/AMR3/ISDN/
64 kbps Packet/User Edit TrCH</td></tr>
<tr><td>Nmax-dpdch</td><td>0, 1</td></tr>
<tr><td>Details</td><td colspan="2">
RMC 12.2 kbps/RMC 64 kbps/RMC 144 kbps/RMC 384 kbps
Each channel coding parameter of the DCH is set according to the standard format selected by Data.

Refer to 3GPP TS25.104 Annex A UL reference measurement channel for details of these channels. See the next and subsequent pages for details of each parameter.

AMR1/AMR2/AMR3/ISDN
Refer to 3GPP TR25.944 4.1.2.2 Example for DCH for details of these channels. See the sections below for details of DTCH, DCCH, and Multiplexing.

DTCH
AMR1: 4.1.2.2.1.2 Example for 12.2 kbps data (TFS = #1)
AMR2: 4.1.2.2.1.2 Example for 12.2 kbps data (TFS = #2)
AMR3: 4.1.2.2.1.2 Example for 12.2 kbps data (TFS = #3)
ISDN: 4.1.2.2.1.6 Example for 64 kbps data

DCCH
AMR1/AMR2/AMR3/ISDN: 4.1.2.2.1.1 Example for 3.4 kbps data

Multiplexing
AMR1/AMR2/AMR3: 4.1.2.2.2.2 Example for multiplexing of 12.2 kbps data and 3.4 kbps data
ISDN: 4.1.2.2.2.5 Example for multiplexing of 64 kbps data and 3.4 kbps data

User Edit TrCH
In this setting, the settings of parameters for TrCH can be changed on the Channel Edit screen that is opened by clicking the Edit button. Select User Edit TrCH when setting a channel other than the standard transport channels described above.

Nmax-dpdch
The maximum number of UL DPDCHs can be set, from 0 or 1 in this software. Ch Code of HS-DPCCH and Ch Code and IQ mapping of E-DPDCH depend on this setting. Refer to the descriptions of HS-DPCCH, E-DPCCH, and E-DPDCH in this section.
</td></tr>
</table>

♦ UL_RMC_12_2 kbps channel coding parameters

Table 3.2.2-1 UL reference measurement channel 12.2 kbps physical channel parameters

Parameter	Unit	Level
Information bit rate	kbps	12.2
DPDCH	kbps	60
DPCCH	kbps	15
DPCCH Slot Format #I	–	0
DPCCH/DPDCH power ratio	dB	–2.69
TFCI	–	On
Repetition	%	22

Table 3.2.2-2 UL reference measurement channel 12.2 kbps transport channel parameters

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	244	100
Transport Block Set Size	244	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Convolution Coding	Convolution Coding
Coding Rate	1/3	1/3
Rate Matching attribute	256	256
Size of CRC	16	12

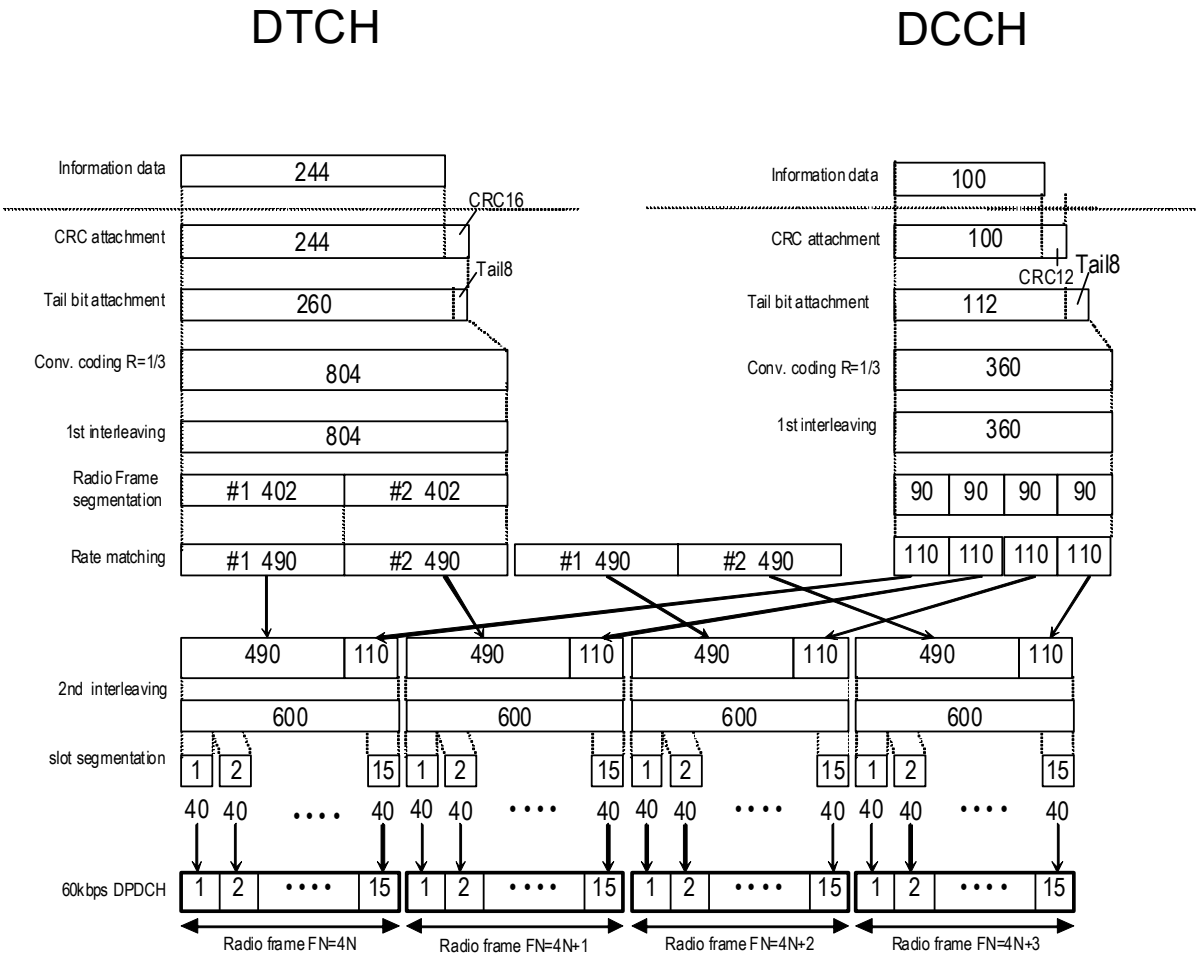


Figure 3.2.2-1 Channel coding for UL reference measurement channel 12.2 kbps

♦ UL_RMC_64 kbps channel coding parameters

Table 3.2.2-3 UL reference measurement channel 64 kbps physical channel parameters

Parameter	Unit	Level
Information bit rate	kbps	64
DPDCH	kbps	240
DPCCH	kbps	15
DPCCH Slot Format #I	–	0
DPCCH/DPDCH power ratio	dB	–5.46
TFCI	–	On
Repetition	%	19

Table 3.2.2-4 UL reference measurement channel 64 kbps transport channel parameters

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	2560	100
Transport Block Set Size	2560	100
Transmission Time Interval	40 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
Rate Matching attribute	256	256
Size of CRC	16	12

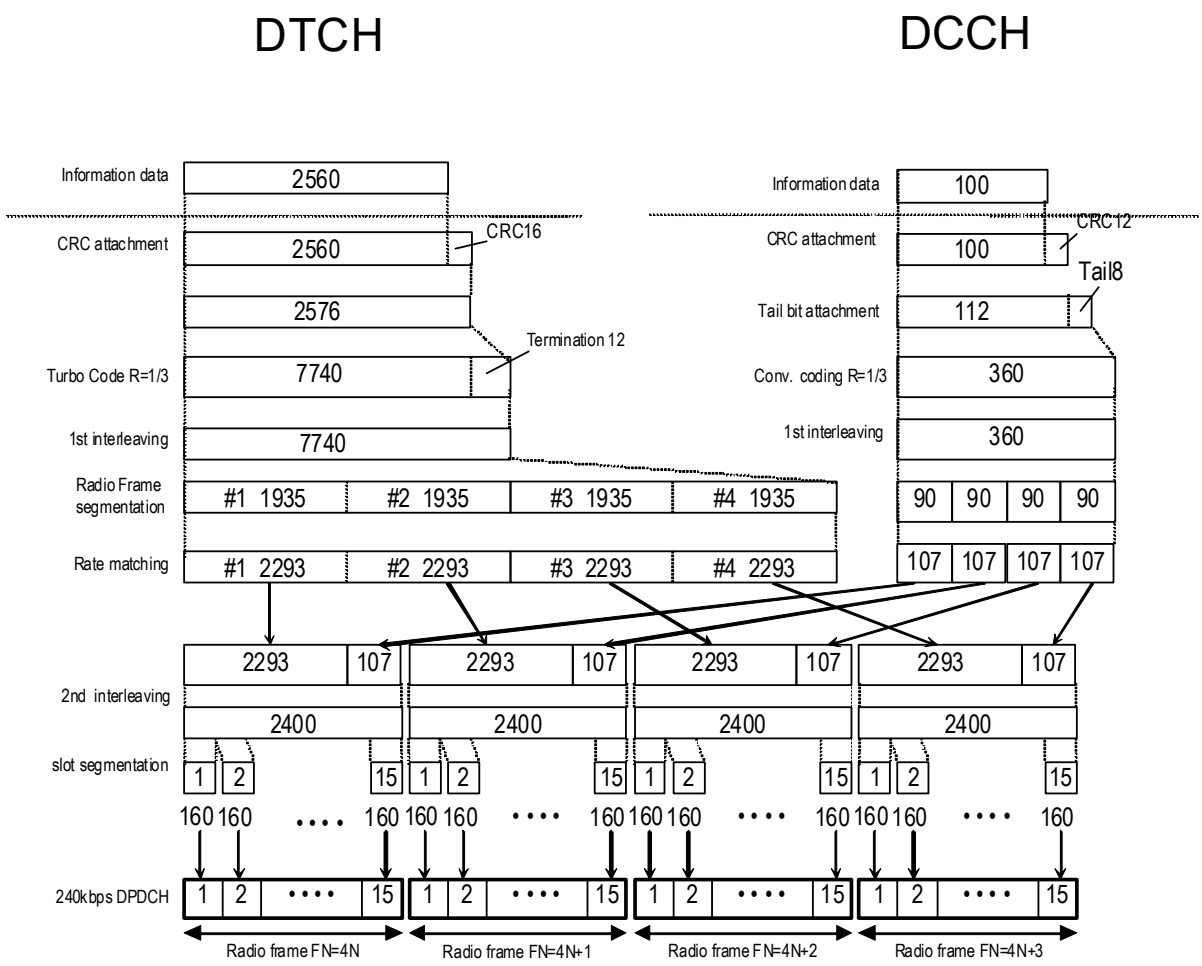


Figure 3.2.2-2 Channel coding for UL reference measurement channel 64 kbps

♦ UL_RMC_144 kbps channel coding parameters

Table 3.2.2-5 UL reference measurement channel 144 kbps physical channel parameters

Parameter	Unit	Level
Information bit rate	kbps	144
DPDCH	kbps	480
DPCCH	kbps	15
DPCCH Slot Format #I	–	0
DPCCH/DPDCH power ratio	dB	–9.54
TFCI	–	On
Repetition	%	8

Table 3.2.2-6 UL reference measurement channel 144 kbps transport channel parameters

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	2280	100
Transport Block Set Size	5760	100
Transmission Time Interval	40 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
Rate Matching attribute	256	256
Size of CRC	16	12

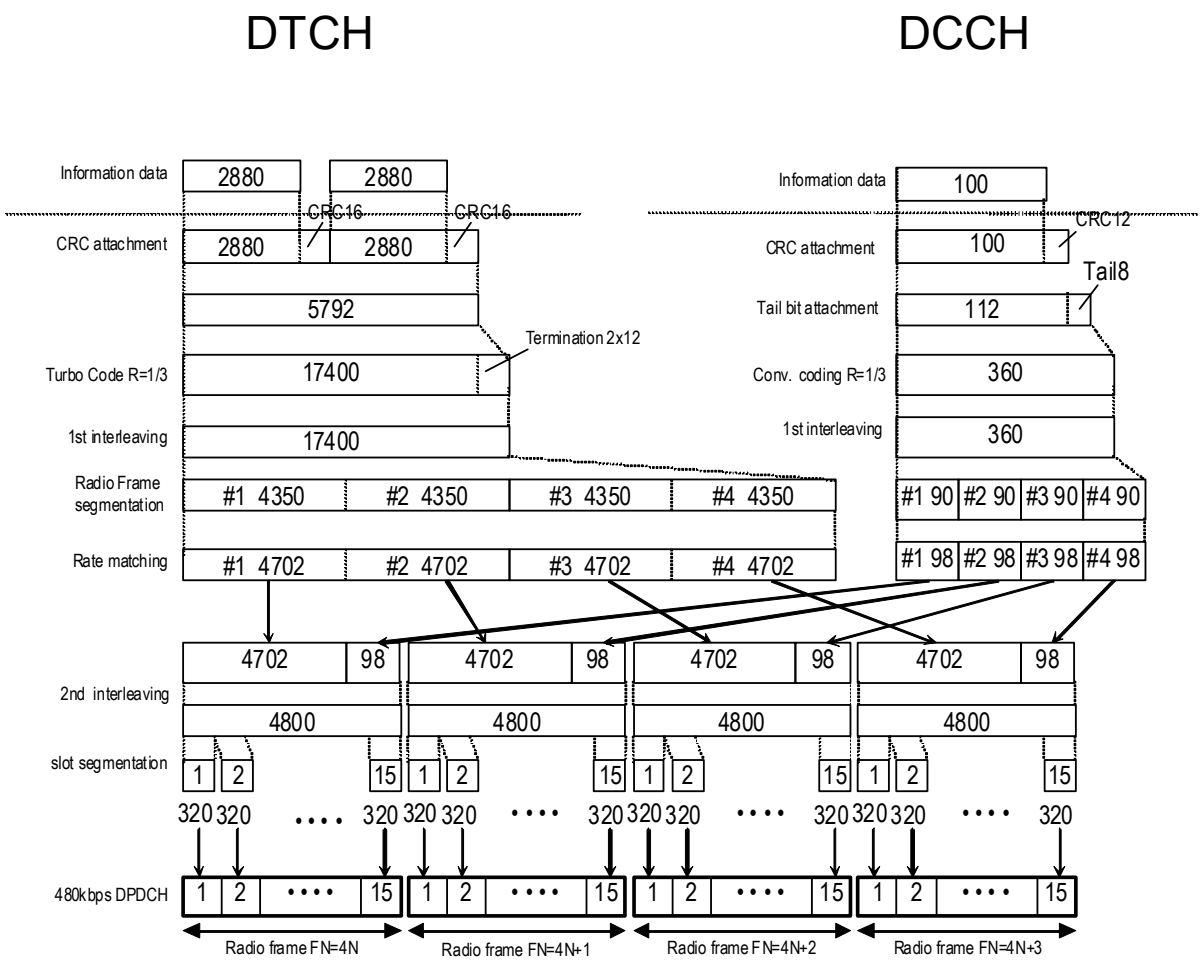


Figure 3.2.2-3 Channel coding for UL reference measurement channel 144 kbps

♦ UL_RMC_384 kbps channel coding parameters

Table 3.2.2-7 UL reference measurement channel 384 kbps physical channel parameters

Parameter	Unit	Level
Information bit rate	kbps	384
DPDCH	kbps	960
DPCCH	kbps	15
DPCCH Slot Format #I	–	0
DPCCH/DPDCH power ratio	dB	–9.54
TFCI	–	On
Puncturing	%	18

Table 3.2.2-8 UL reference measurement channel 384 kbps transport channel parameters

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	3840	100
Transport Block Set Size	15360	100
Transmission Time Interval	40 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
Rate Matching attribute	256	256
Size of CRC	16	12

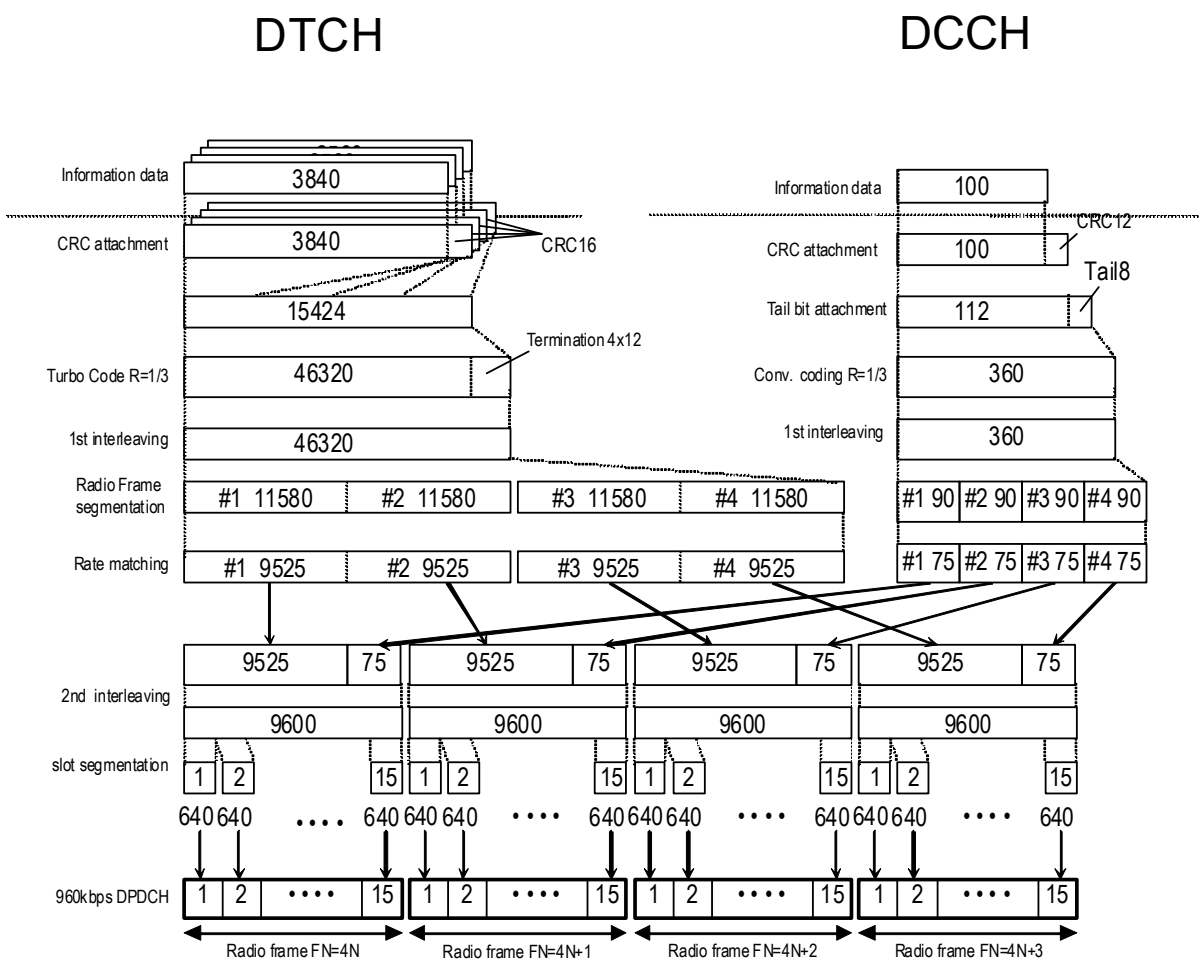


Figure 3.2.2-4 Channel coding for UL reference measurement channel 384 kbps

Setting Item	HS-DPCCH	
Functional Outline	Performs settings for HS-DPCCH.	
Setting Parameters	Setting Range	
	ON/OFF	ON or OFF
	Timing Offset	0 to 149
	ACK_Power	–40.00 to 0 [dB], setting resolution: 0.01 dB
	NACK_Power	–40.00 to 0 [dB], setting resolution: 0.01 dB
	CQI_Power	–40.00 to 0 [dB], setting resolution: 0.01 dB
	ACK Pattern	ACK_only, NACK_only, alt_ACK_NACK_DTX
	CQI value	0 to 30
	Pattern Setting File	Use or Not use
Details	[Timing Offset] The output timing difference of HS-DPCCH from DPCCH is set with the setting resolution of 256 chips. When "1" is set, HS-DPCCH is output behind DPCCH by 256 chips. [ACK_Power, NACK_Power] The transmission power of the HARQ-ACK field for HS-DPCCH is set to the ACK_Power set value in ACK transmission, and set to the NACK_Power set value in NACK transmission. [CQI_Power] The transmission power of the CQI field for HS-DPCCH is set. Refer to the description of the **Normalize Power** button in this section for normalization executed when the **Normalize Power** button is pressed. [ACK Pattern] **ACK_only**, **NACK_only**, and **alt_ACK_NACK_DTX** indicate "transmitting ACK only," "transmitting NACK only," and "transmitting ACK, NACK, and DTX by rotation," respectively.	

Details (Cont'd)

[Pattern Setting File]
When this check box is selected, the "Open file" screen is displayed to select a text file with extension ".txt" to be read for setting the transmission pattern of HS-DPCCH.
When **Pattern Setting File** is selected, the setting of **ACK Pattern** is invalid.

The following shows a pattern setting file format example:

#MX269901A HSDPA/HSUPA IQproducer HS-DPCCH Pattern Setting File
Pattern Cycle = 6 frame
A00N00D00D00D00
A01A01A01A01A01
N30N30N30N30N30
D99D99D99D99D99
A00N00D00D00D00
A01A01A01A01A01
:

Error judgment and error display are performed during file reading with the following conditions:

(1) Pattern cycle: 1, 2, 3, …, 2048 frames
Sets the period of the HS-DPCCH pattern in frame units.

(2) For each HS-DPCCH pattern number (number other than the pattern cycle), one subframe is represented by a combination of three characters: α, β_0, and β_1.
α: A (ACK), N (NACK), or D (DTX)
$\beta_0\beta_1$: CQI number 00, 01, 02, …, 30, 99 ("99" indicates DTX.)

(3) Although each line is fed by 15 characters (1 frame) in the example above, commas (,), periods (.), spaces, and line feed characters are ignored.

[Ch Code of HS-DPCCH]
Ch Code of HS-DPCCH is set depending on the Nmax-dpdch value, as shown in the table below:

Table Ch Code of HS-DPCCH

$N_{max\text{-}dpdch}$	Channelization code c_{hs}
0	$C_{ch,256,33}$
1	$C_{ch,256,64}$

<table>
<tr><td>Setting Item</td><td colspan="2">E-DPCCH, E-DPDCH</td></tr>
<tr><td>Functional Outline</td><td colspan="2">Performs settings for E-DPCCH and E-DPDCH(s).</td></tr>
<tr><td rowspan="6">Setting Parameters</td><td colspan="2">Setting Range</td></tr>
<tr><td>Channel ON/OFF for E-DPCCH</td><td>ON or OFF</td></tr>
<tr><td>Channel ON/OFF for E-DPDCH(s)</td><td>ON or OFF</td></tr>
<tr><td>Power of E-DPCCH</td><td>–40.00 to 0 [dB], setting resolution: 0.01 dB</td></tr>
<tr><td>Power of E-DPDCH(s)</td><td>–40.00 to 0 [dB], setting resolution: 0.01 dB</td></tr>
<tr><td>E-DPDCH(SF2) Power/ E-DPDCH(SF4) Power</td><td>–10.00 to 10.0 [dB], setting resolution: 0.01 dB</td></tr>
<tr><td>Details</td><td colspan="2">[Channel ON/OFF for E-DPCCH, Channel ON/OFF for E-DPDCH(s)]
The channel On/Off can be set. If this parameter is set to Off, the corresponding channel becomes Off regardless of the set value (On/Off) described in the HARQ process setting file.

[Power of E-DPCCH]
The channel gain of E-DPCCH is set.

[Power of E-DPDCH(s)]
The channel gain of E-DPDCH(s) is set. If E-DPDCH(s) is a multi-code (2SF2, 2SF4, or 2SF2and 2SF4), the total power of E-DPDCH channels corresponds to the value set by this parameter.
The channel gain of E-DPDCH(s) can be set for each E-DCH TTI by using an HARQ process setting file. In this event, E-DPDCHs are multiplexed by the power ratio shown below.

(i) E-DCH TTI when E-DPDCH(s) Gain is set to 0 dB in the HARQ process setting file
The E-DPDCHs are multiplexed by the power ratio set in Power of E-DPDCH(s) in the main screen.

(ii) E-DCH TTI when E-DPDCH(s) Gain is set to a value other than 0 dB in HARQ process setting file
The E-DPDCHs are multiplexed by the power ratio obtained by adding “Power of E-DPDCH(s) set in the main screen” and “Power of E-DPDCH(s) set in the HARQ process setting file.”

[Ch Codes of E-DPDCH(s)]
The channelization code of E-DPDCH is displayed. When HARQ Process Setting File is set in the HSUPA Edit screen, Ch Code of E-DPDCH is not displayed on the main screen.

[Ch Code of E-DPCCH, Ch Code of E-DPDCH]
The channelization code of each channel is displayed. The channelization codes can be set by editing **E-DPDCH Channel Code** in the HSUPA Edit screen (opened by clicking the **Edit** button on the main screen). When an HARQ process setting file is used, it can also be set by editing **Channelization Codes** of the HARQ process setting file.</td></tr>
</table>

Details (Cont'd)

IQ mapping of E-DPDCH is set depending on the settings of HS-DSCH Configured and Nmax-dpdch, as shown in the table below. Note, however, that the same number of E-DPDCHs are mapped to IQ if the Ch Code of E-DPDCH is set to 2SF2, 2SF4, or 2SF2and2SF4.

Table IQ mapping of E-DPDCH
(except the cases when Ch Code is 2SF2, 2SF4, or 2SF2and2SF4)

$N_{max\text{-}dpdch}$	HS-DSCH configured	IQ mapping
0	No/Yes	I
1	No	Q
1	Yes	I

E-DPCCH is mapped to the I phase.

[E-DPDCH(SF2) Power/E-DPDCH(SF4) Power]
The power ratio of SF2 E-DPDCH to SF4 E-DPDCH when 2SF2and2SF4 is selected is set.

3.2.3 Details of setting parameters on Channel Edit screen

When the **Edit** button is clicked, the Channel Edit screen shown below is displayed. This section describes the details of the setting items on this screen.

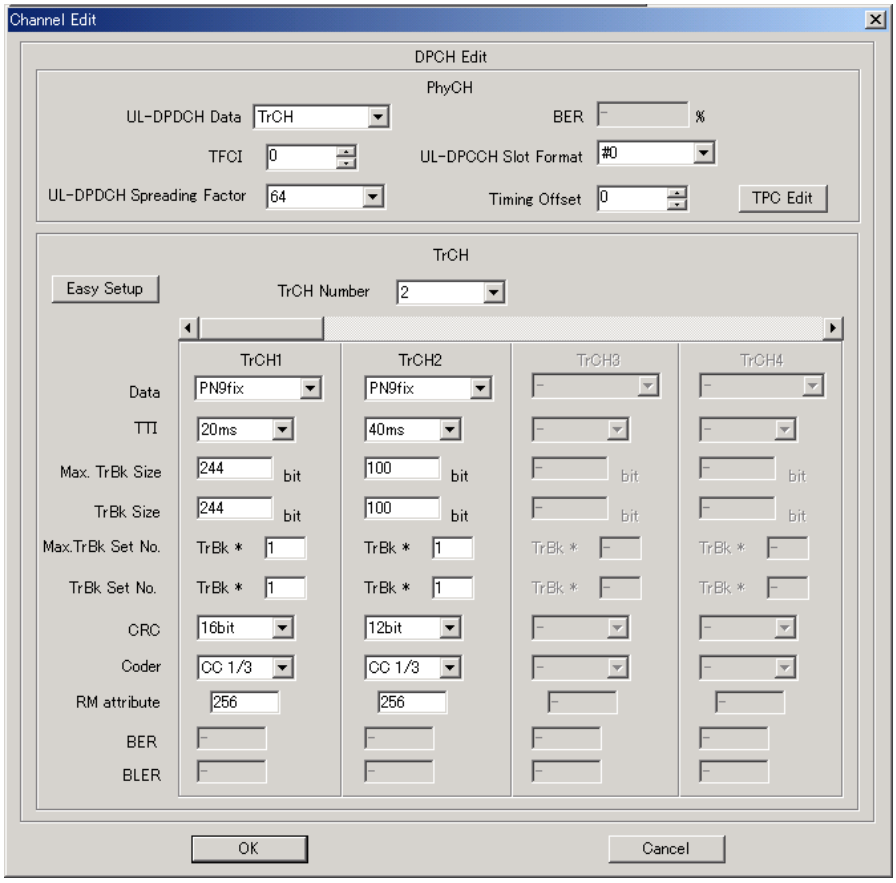


Figure 3.2.3-1 Channel Edit screen

■ When setting the User Edit TrCH in Data, it is possible to apply the transport channel settings of the standard pattern by pressing the **Easy Setup** button so as to facilitate an editing operation.

■ OK and Cancel buttons

The **OK** and **Cancel** buttons are provided to close the Channel Edit screen after performing setting.

- When the **OK** button is clicked:
  The Channel Edit screen is closed, applying the settings.
- When the **Cancel** button is clicked:
  The Channel Edit screen is closed, ignoring the settings.

Setting Item	DPCH Edit (PhyCH)	
Functional Outline	Performs settings for UL-DPCH.	
Setting Parameters	Setting Range	
	UL-DPDCH Data	PN9/PN9fix/PN15fix/16 bitRepeat/TrCH
	TFCI	0 to 1023
	UL-DPDCH Spreading Factor	4, 8, 16, 32, 64, 128, 256
	BER	0.0 to 100.0%, setting resolution: 0.1%
	UL-DPDCH Slot Format	#0 or #1
	Timing Offset	0 to 149
	TPC Edit	0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 to 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111 1111
Details	[UL-DPDCH Data] Selects the data to be inserted to UL-DPDCH of the physical channel. **PN9fix/PN15fix** is PN9/PN15 data reset by each frame. PN data is not continuous between frames. When performing operations such as BER (Bit Error Rate) measurement for a reception sensitive test, select **PN9** with which PN data is continuous between frames. When **TrCH** is selected, a physical frame structure is configured for DPDCH and DPCCH and the data for which DCH frame coding is executed is inserted to DPDCH. [UL- DPDCH Slot Format, TPC Edit] These settings are enabled only when **UL-DPDCH Data** is set to **TrCH**. [BER] Sets the error rate to be inserted to the transmission data. This setting is valid when **UL-DPDCH Data** is set to **PN9**. When **UL-DPDCH Data** is set to **[PN9]**, an error is randomly inserted to the PN9 data that is inserted directly to a physical frame. [Timing Offset] Sets an offset for the frame timing with a value of 256 chip multiplied by n. [TPC Edit] Sets the data to be inserted to the TPC bit in a 4-frame cycle. Each bit indicates the symbol (0/1) of the TPC bit to be assigned to each slot. Data is assigned to each slot sequentially from the left.	

Setting Item	DPCH Edit (TrCh)	
Functional Outline	Performs settings for TrCH of UL-DPCH.	
Setting Parameters	Setting Range	
	TrCH Number	1 to 8
	Data	PN9/PN9fix/PN15fix/16 bitRepeat/User File
	TTI	10, 20, 40, 80 ms
	Max. TrBk Size	0 to 5000
	TrBk Size	0 to 5000
	Max. TrBk Set No.	0 to 64
	TrBk Set No.	0 to 64
	CRC	0, 8, 12, 16, 24 bits
	Coder	CC1/2, CC1/3, TC
	RM attribute	1 to 256
	BER	0.0 to 100.0%, setting resolution: 0.1%
	BLER	0 to 100%, setting resolution: 1%
Details	[TrCH Number] Sets the number of required TrCH (transport channels). The number of TrCh that can be edited varies depending on this setting. [Data] Selects the data to be inserted to Information Data of the transport channel. **PN9fix/PN15fix** is PN9/PN15 data reset at the last data of a signal. The last data of a signal and the first data of the next signal are not continuous. [Max. TrBk Size], [Max. TrBk Set No.] Sets the maximum TrBk Size and the number of TrBk Sets in TFCS. [Coder] Selects the channel coding type. CC1/2 and CC1/3 indicate a convolutional code at coding rates of 1/2 and 1/3 respectively. TC indicates a turbo code. [BER] This setting is valid when **Data** is set to **PN9**. The bits in the information data to be inserted to the transport channel are randomly inverted according to the specified error rate. [BLER] This setting is valid when **Data** is set to **PN9**. Half of the bits in the CRC to be added to each transport block are inverted randomly according to the specified error rate.	

3.2.4 Details of setting parameters on HSUPA Edit screen

When the **Edit** button in the E-DPDCH(s) frame or the **E-DPCCH** button on the main screen is clicked, the HSUPA Edit screen shown below is displayed. This section describes the details of the setting items on this screen.

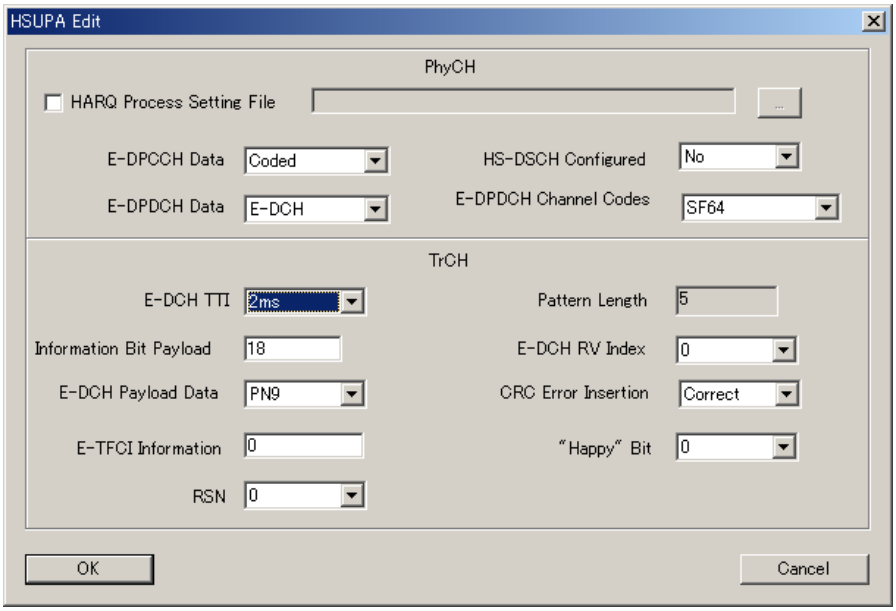


Figure 3.2.4-1 HSUPA Edit screen

■ OK and Cancel buttons

The **OK** and **Cancel** buttons are provided to close the HSUPA Edit screen after performing setting.

- When the **OK** button is clicked:
  The HSUPA Edit screen is closed, applying the settings.
- When the **Cancel** button is clicked:
  The HSUPA Edit screen is closed, ignoring the settings.

Setting Item	E-DPDCH and E-DPCCH Edit (PhyCH)	
Functional Outline	Performs settings for Physical Layer E-DPDCH and E-DPCCH.	
Setting Parameters	Setting Range	
	HARQ Process Setting File	When this check box is selected, the common dialog box is displayed and an HARQ process setting file to be used can be selected.
	E-DPCCH Data	PN9, PN9fix, PN15fix, 16bit repeat, Coded
	E-DPDCH Data	PN9, PN9fix, PN15fix, 16bit repeat, E-DCH
	HS-DSCH Configured	No, Yes
	E-DPDCH Channel Codes	SF256, SF128, SF64, SF32, SF16, SF8, SF4, 2SF4, 2SF2, 2SF2and2SF4 Note that 2SF2and2SF4 cannot be selected when Nmax-dpdch is set to 1, and SF256 and SF128 cannot be selected when E-DCH TTI is set to 2 ms.
Details	[HARQ Process Setting File] When an HARQ process setting file is used, all of the other parameter settings in the HSUPA Edit screen are invalid, and the values described in the HARQ process setting file are set to the E-DPDCH and E-DPCCH parameters. [E-DPCCH Data] When PN9, PN9fix, PN15fix, or 16bit repeat is selected, the selected data is mapped to E-DPCCH, without being coded. When Coded is selected, the data that is coded according to the setting of TrCH is mapped to E-DPCCH. [E-DPDCH Data] When PN9, PN9fix, PN15fix, or 16bit repeat is selected, the selected data is mapped to E-DPDCH and diffused, without being coded. When E-CDH is selected, the data set in E-DCH Payload Data of TrCH is channel-coded and mapped to E-DPDCH. [E-DPDCH Channel Codes] Sets Ch Code of E-DPDCH. Note that 2SF2and2SF4 cannot be selected when HS-DSCH Configured is set to Yes. When 2SF2 is selected, a channel of SF2 E-DPDCH is mapped to each of phases I and Q. When 2SF4 is selected, a channel of SF4 E-DPDCH is mapped to each of phases I and Q. When 2SF2and2SF4 is selected, a channel of SF2 E-DPDCH and a channel of SF4 E-DPDCH are mapped to each of phases I and Q (four channels are mapped in total).	

Setting Item	E-DPDCH and E-DPCCH Edit (TrCH)	
Functional Outline	Performs settings for transport layer of E-DPDCH and E-DPCCH.	
Setting Parameters	Setting Range	
	E-DCH TTI	2 ms, 10 ms.
	Pattern Length	Display only. "5" is displayed when E-DCH TTI is set to 2 ms. "1" is displayed when E-DCH TTI is set to 10 ms.
	Information Bit Payload	18 to 11484 (when E-DCH TTI is set to 2 ms.) 18 to 20000 (when E-DCH TTI is set to 10 ms.)
	E-DCH RV Index	0 to 3
	E-DCH Payload Data	PN9, PN9fix, PN15fix, 16bit repeat
	CRC Error Insertion	Correct, Error
	E-TFCI Information	0 to 127
	"Happy" Bit	0, 1
	RSN	0 to 3
Details	[Pattern Length] "5" is displayed when E-DCH TTI is set to 2 ms, and "1" is displayed when E-DCH TTI is set to 10 ms. Display only. [Information Bit Payload] Sets the length of E-DCH payload data. [E-DCH RV Index] Sets E-DCH RV Index. The value set in this parameter is applied to all E-DCH RVs unless an HARQ process setting file is not used. [CRC Error Insertion] Sets whether to add an error CRC bit or a correct CRC bit to E-DCH. When All Error is set, an error CRC bit is added to any E-DCH. [E-TFCI Information] Sets a value of E-TFCI Information, which is E-DPCCH data. ["Happy" Bit] Sets a value of "Happy Bit," which is E-DPCCH data. [RSN] Sets a value of RSN, which is E-DPCCH data.	

3.2.4.1 HARQ Process Setting File

When an HARQ process setting file is used, payload data, Ch Code, and other parameters of E-DPDCH and E-DPCCH can be set in detail for each E-DCH TTI. Since HARQ process setting files are a csv-formatted file, it can be edited and created using Microsoft Excel (see Figure 3.2.4.1-1) or a text editor (see Figure 3.2.4.1-2).

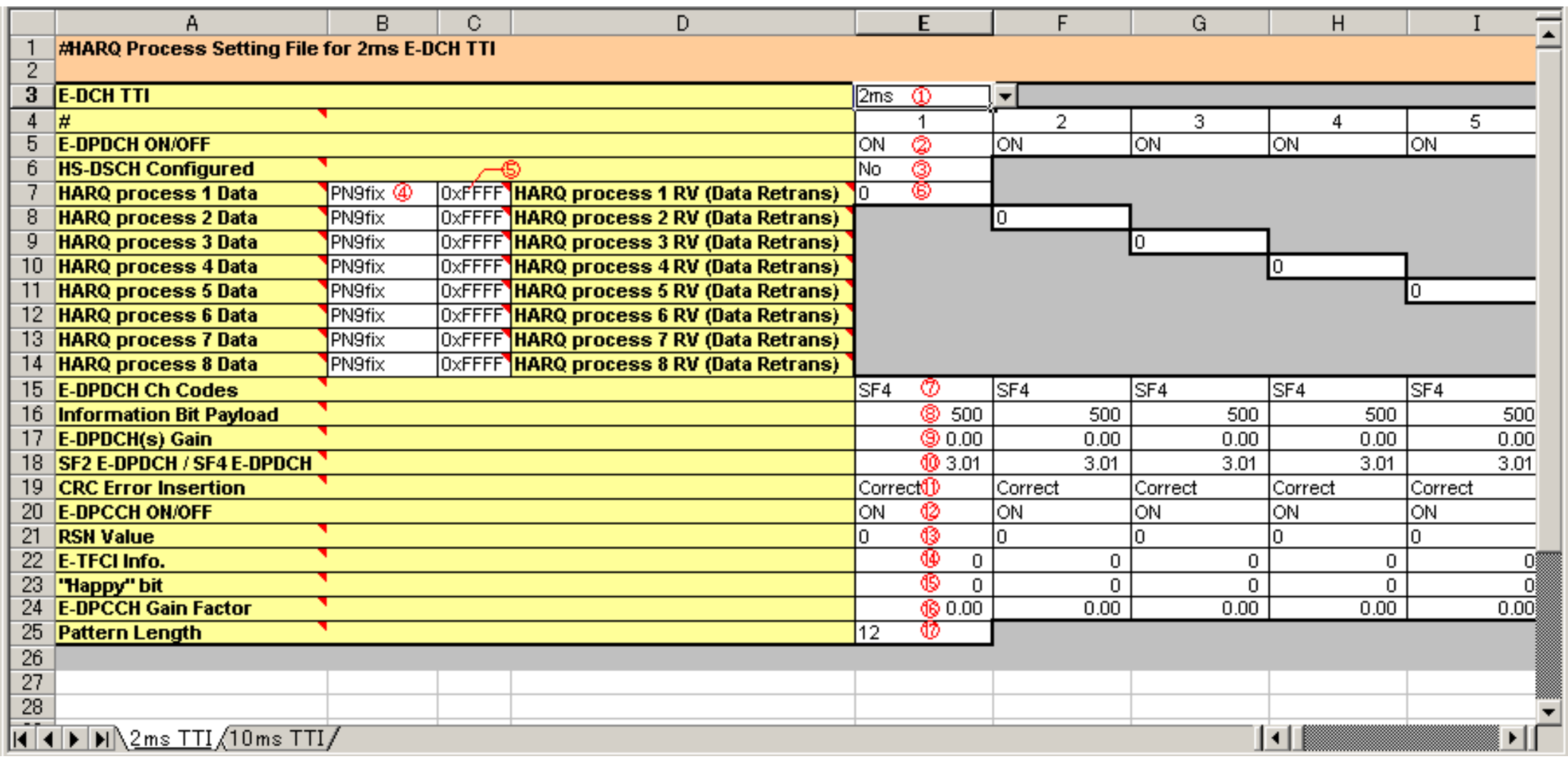


Figure 3.2.4.1-1 Editing HARQ process setting file using Microsoft Excel

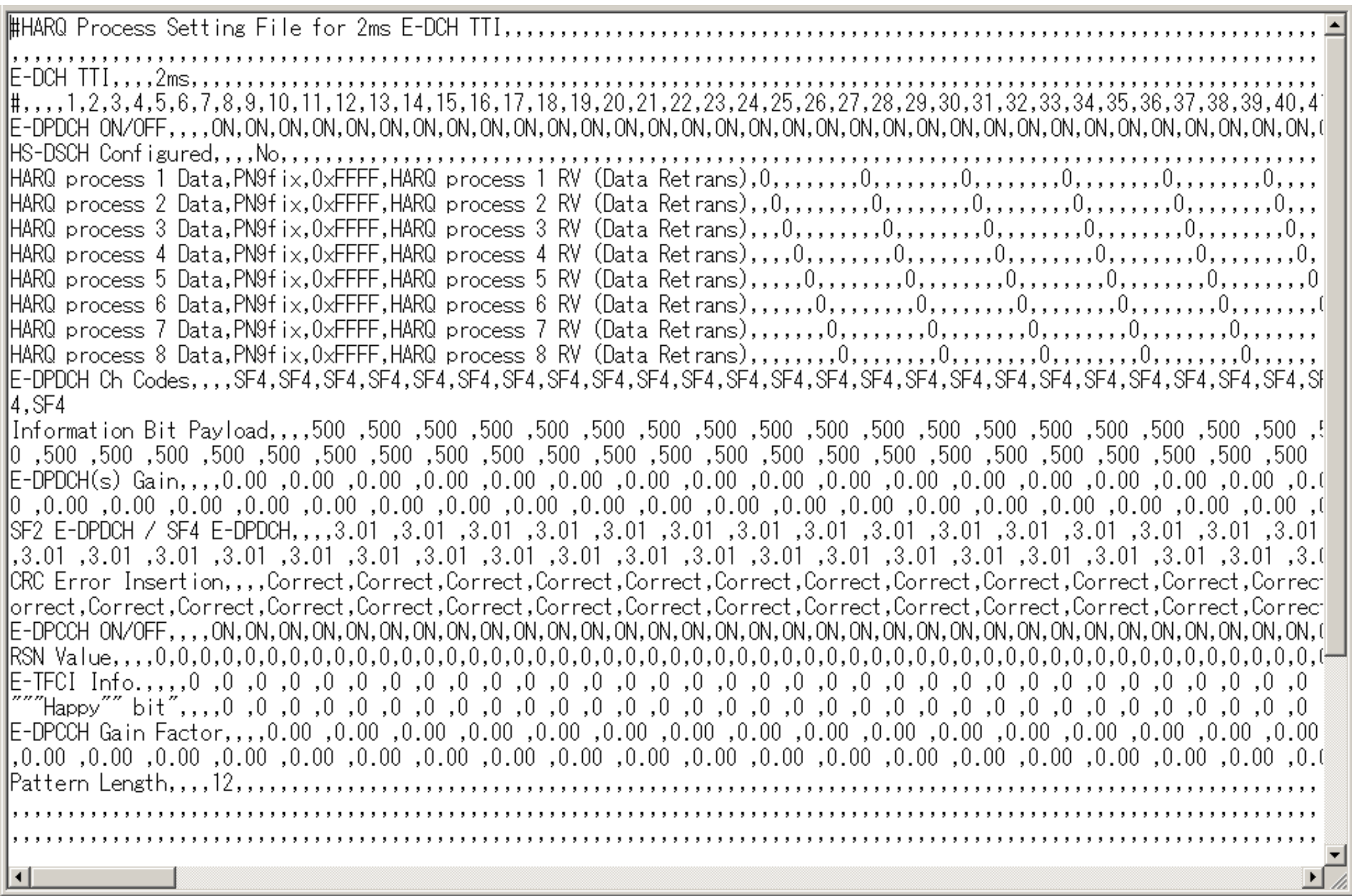


Figure 3.2.4.1-2 Editing HARQ process setting file using text editor

The HSDPA folder is created in the IQproducer folder when this software is installed, and an HARP process setting file *HARQ Process Setting File.xls* is stored in this folder. This file contains two types of reference settings for 2 ms TTI and 10 ms TTI in separated sheets. Edit parameters as required on the target sheet, and save the file in the csv format before using it with this software. In addition to *HARQ Process Setting File.xls*, the HSDFPA folder also includes other HARP process setting files: *HARQ_process_setting_FRC1. csv.xls* through *HARQ_process_setting_FRC7. csv.xls*. These files are used to facilitate setting in accordance with E-DPDCH Fixed Reference Channel (FRC) defined in 3GPP TS25.141. These files are already saved in the csv format, so they can be selected as HARQ process setting files as they are (i.e., without conversion). Note, however, that the above files contain only basic parameters.

Set an HARQ process setting file according to the table below.

Setting Item	HARQ Process Setting File	
Functional Outline	Performs setting for E-DPDCH and E-DPCCH.	
Setting Parameters	Setting Range	
	E-DCH TTI [1]	2 ms, 10 ms
	E-DPDCH ON/OFF [2]	ON, OFF
	HS-DSCH Configured [3]	Yes, No
	HARQ Process 1 Data to HARQ Process 8 Data [4]	PN9, PN9fix, PN15fix, 16bit repeat
	16 bit repeat value [5]	0x0000 to 0xFFFF
	HARQ Process 1 RV (Data Retrans) to HARQ Process 8 RV (Data Retrans) [6]	0, 1, 2, 3, 0 (Retrans), 1 (Retrans), 2 (Retrans), 3 (Retrans)
	E-DPDCH(s) Ch Codes [7]	SF256, SF128, SF64, SF32, SF16, SF8, SF4, 2SF4, 2SF2, 2SF2and2SF4 Note that 2SF2and2SF4 cannot be selected when HS-DSCH Configured is set to Yes, and SF256 and SF128 cannot be selected when E-DCH TTI is set to 2 ms.
	Information Bit Payload [8]	1 to 11484 (when E-DCH TTI = 2 ms) 1 to 20000 (when E-DCH TTI = 10 ms)
	E-DPDCH(s) Gain [9]	–20.00 to 20.00 dB, setting resolution: 0.01 dB
	SF2 E-DPDCH/SF4 E-DPDCH [10]	–20.00 to 20.00 dB, setting resolution: 0.01 dB
	CRC Error Insertion [11]	Correct, Error
	E-DPCCH ON/OFF [12]	ON, OFF
	RSN Value [13]	0 to 3
	E-TFCI Info. [14]	0 to 127
	“Happy” Bit [15]	0, 1

(Cont'd)

<table>
<tr><td rowspan="2">Setting Parameters</td><td>E-DPCCH Gain Factor [16]</td><td>–20.00 to 20.00 dB, setting resolution: 0.01 dB</td></tr>
<tr><td>Pattern Length [17]</td><td>1 to 2048</td></tr>
<tr><td>Details</td><td colspan="2">[E-DCH TTI]
Sets E-DCH TTI. In the sample Excel file, the HARQ process period when E-DCH TTI is "2ms" is set to 8 subframes, and that when E-DCH TTI is "10ms" is set to 4 frames.
[#]
Sets the E-DCH TTI number. Therefore, enter the subframe number when E-DCH TTI is "2ms" and enter the frame number when E-DCH TTI is "10ms."
[E-DPDCH ON/OFF]
Set ON/OFF of E-DPDCH for each E-DCH TTI. Note, however, that E-DPDCH is OFF for all frames regardless of this setting, if E-DPDCH is set to OFF on the Uplink main screen.
[HS-DSCH Configured]
Sets HS-DSCH Configured. IQ mapping of E-DPDCH depends on this setting. Refer to the descriptions of E-DPDCH and E-DPCCH in Section 3.2.2 "Uplink Setup screen."
[HARQ Process 1 Data to HARQ Process 8 Data]
Sets payload data of E-DCH for each HARQ process. For example, when HARQ Process 2 Data is set to "PN9fix," the payload data of E-DCH for E-DCH TTI, for which the value of RV is set by HARQ Process 2 RV (Data Retrans), is
set to PN9. Similarly, when HARQ Process 2 Data is set to "PN15fix," the payload data of that HARQ process is set to PN15.
When "PN9fix" or "PN15fix" is selected, the PN code of the payload data is not continuous. When "PN9" is selected, the E-DCH payload data of the HARQ process is continuous PN9. When "16bit repeat" is selected, the bit string set by [16 bit repeat value] is repeated and configures the payload data.
[HARQ Process 1 RV (Data Retrans) to HARQ Process 8 RV (Data Retrans)]
Sets retransmission of the RV and payload of the HARQ process. For example, when HARQ Process 2 RV is set to 1 while E-DCH TTI = 2ms and [#] = 3, the HARQ Process 2 data is coded with RV = 1 for 3 subframes and is output. When "(Retrans)" is suffixed to RV, the previous payload data that was transmitted in the HARQ process (the data that was transmitted on the left cell in the same row of the HARQ process setting file) will be transmitted.
[E-DPDCH(s) Ch Codes]
Sets Ch Code of E-DPDCH. Note that 2SF2and2SF4 cannot be selected when HS-DSCH Configured is set to Yes. When 2SF2 is selected, a channel of SF2 E-DPDCH is mapped to each of phases I and Q. When 2SF4 is selected, a channel of SF4 E-DPDCH is mapped to each of phases I and Q. When 2SF2and2SF4 is selected, a channel of SF2 E-DPDCH and a channel of SF4 E-DPDCH are mapped to each of phases I and Q (four channels are mapped in total).</td></tr>
</table>

(Cont'd)

Details (Cont'd)	[Information Bit Payload] Sets the length of E-DCH payload data. Sets the power ratio of SF2 E-DPDCH and SF4 E-DPDCH when 2SF2and2SF4 is selected for E-DPDCH(s) Ch Codes. [E-DPDCH(s) Gain] The power that is obtained by adding the value set by this parameter as an offset to the value set in Power of E-DPDCH(s) on the main screen becomes the power of E-DPDCH(s) (or the total power of E-DPDCH channels if E-DPDCH(s) is a multi-code). [E-DPDCH(SF2) Power/ E-DPDCH(SF4) Power] [CRC Error Insertion] Sets whether to add an error CRC bit or a correct CRC bit. When "Error" is set, 12 bits out of CRC 24 bits are inverted and added as a CRC bit. [E-DPCCH ON/OFF] Sets ON/OFF of E-DPCCH for each E-DCH TTI. Note, however, that E-DPCCH is OFF for all frames regardless of this setting, if E-DPCCH is set to OFF on the Uplink main screen. [RSN Value] Sets a value of RSN that is transmitted on E-DPCCH. [E-TFCI Info.] Sets a value of E-TFCI Information that is transmitted on E-DPCCH. ["Happy" bit] Sets a value of "Happy Bit" that is transmitted on E-DPCCH. [E-DPCCH Gain] The power obtained by adding the value set by this parameter is added as an offset to the value set in Power of E-DPCCH on the main screen becomes the power of E-DPCCH. [Pattern Length] Sets the pattern length for each E-DCH TTI. For example, when Pattern Length is set to 8, a waveform pattern that consists of a repetition of data corresponding to "1" through "8" in the [#] row is created for E-DPDCH and E-DPCCH. The settings described in the [#] rows greater than Pattern Length in the csv file are ignored and are not used during waveform pattern generation.

3.2.5 Details of setting parameters on Channel Gain Setup screen

When the **Channel Gain Setup** is selected from the **Edit** menu, the Channel Gain Setup screen shown below is displayed. This section describes the details of the setting items on this screen.
Note that the Channel Gain Setup screen cannot be opened if UL-DPCCH is set to Off, or all Channels except for UL-DPCCH are set to Off on the Uplink main screen.

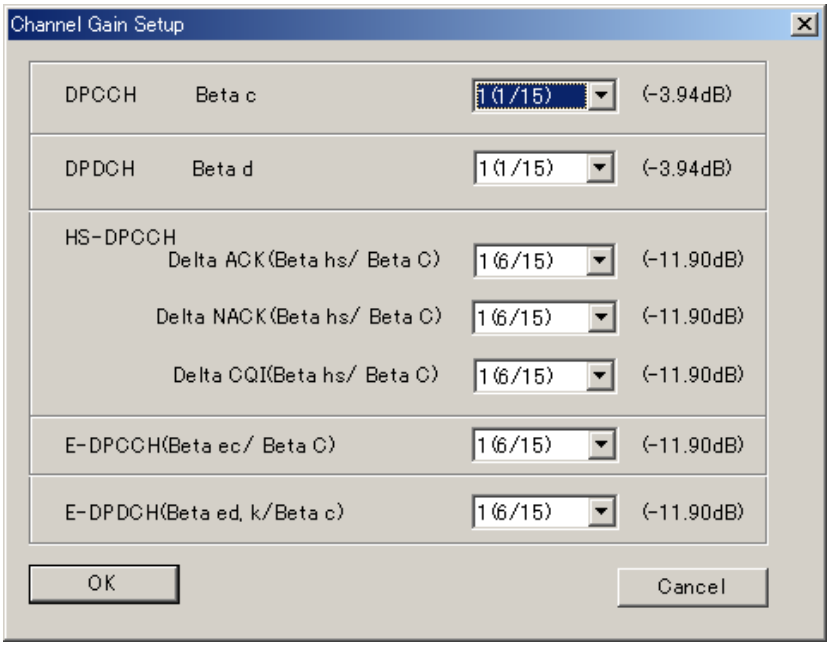


Figure 3.2.5-1 Channel Gain Setup screen

Setting Item	Channel Gain	
Functional Outline	Performs settings for each channel gain.	
Setting Parameters	Setting Range	
	DPCCH (Beta c)	0 (Switch Off) to 15 (1.0)
	DPDCH (Beta d)	0 (Switch Off) to 15 (1.0)
	Delta ACK (Beta hs/Beta c)	0 (5/15) to 8 (30/15)
	Delta NACK (Beta hs/Beta c)	0 (5/15) to 8 (30/15)
	Delta CQI (Beta hs/Beta c)	0 (5/15) to 8 (30/15)
	E-DPCCH (Beta ec/Beta c)	0 (5/15) to 8 (30/15)
	E-DPDCH (Beta ed, k/Beta c)	0 (5/15) to 29 (168/15)

(Cont'd)

Details	Sets the gain of the channels for which On is set in the Uplink main screen, according to the quantized waveform amplitude ratio. In the Channel Gain Setup screen, the E-DPDCH channel gain displayed in dB units indicates the total gain of all E-DPDCHs (e.g., total gain of two E-DPDCHs when 2SF2 is selected). Note, however, the waveform amplitude ratio does not match the value set in dB units if 2SF2, 2SF4, or 2SF2and2SF4 is selected for E-DPDCH Channel Codes, because the waveform amplitude ratio to be set is for only one channel. When 2SF2and2SF4 is selected for E-DPDCH Channel Codes, the waveform amplitude ratio can be set for one E-DPDCH of SF4 (the value displayed in dB units is a total gain of E-DPDCHs of SF2 and SF4). When the **OK** button is clicked after applying settings to close the Channel Gain Setup screen, the settings for each item are converted to [dB] units and displayed in the Channel Edit screen. When the **Cancel** button is clicked, the screen is closed without reflecting the settings for each item on the Channel Edit screen.

3.2.6 Calculation screen

Clicking **Calculation & Load**, **Calculation & Play**, or the **OK** button on the Export File dialog box 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 the **Cancel** button. When cancelled, it returns to the main screen.

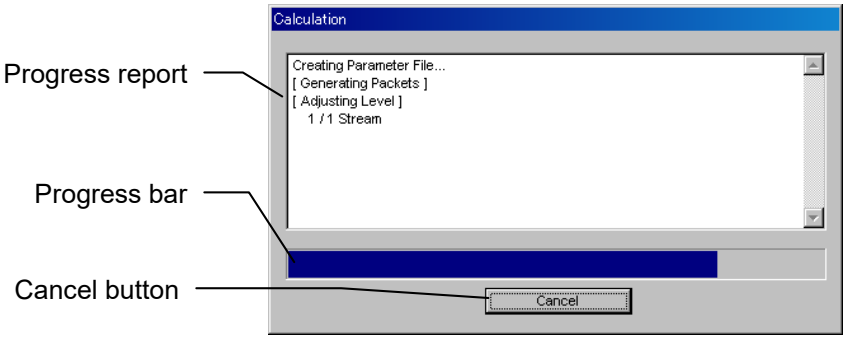


Figure 3.2.6-1 Calculation Screen (In Progress)

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.

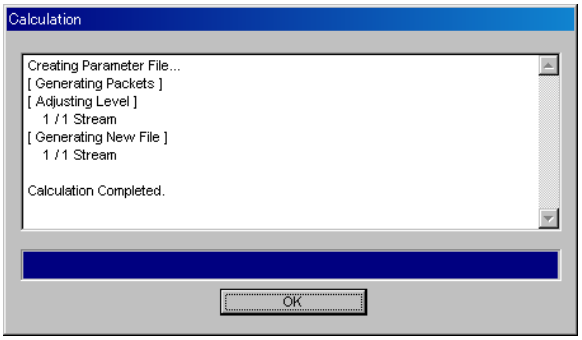


Figure 3.2.6-2 Calculation Screen (Completed)

Note:

When using this software on MG3710A, and selecting **Calculation & Load** or **Calculation & Play**, the waveform generation ends without displaying the above screen.

3.2.7 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.

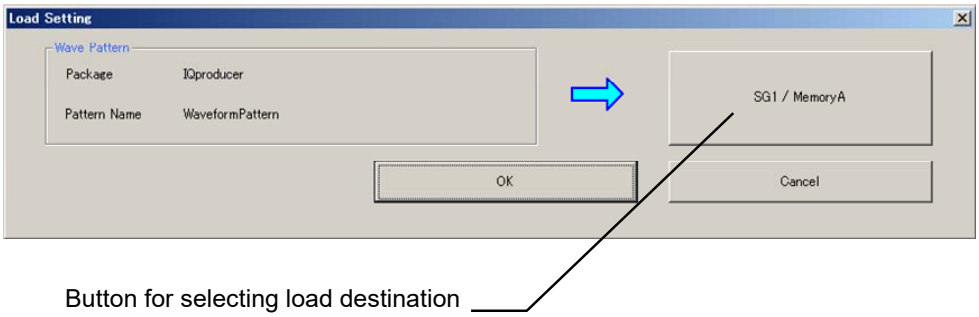


Figure 3.2.7-1 Load Setting Screen

The Select Memory screen will display after clicking the load destination in the Load Setting screen.

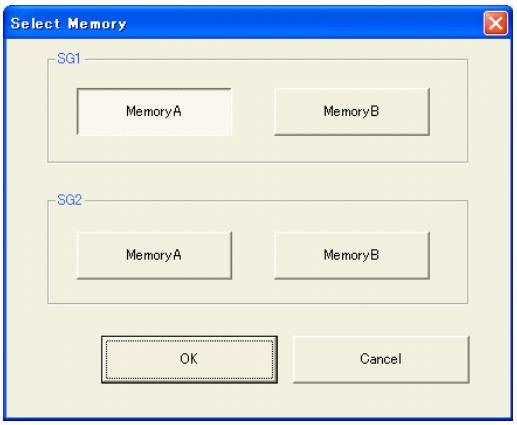


Figure 3.2.7-2 Select Memory Screen

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.

Notes:

- To exit this screen without loading the waveform pattern, click the **Cancel** button in the Load Setting screen.

- If the configuration of generated waveform pattern used two memories, the Select SG screen displays just like Calculation & Play.

3.2.8 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.

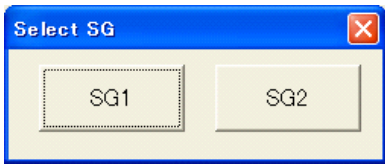


Figure 3.2.8-1 Select SG Screen

3.2.9 Saving/reading parameters

This numeric values and settings for each item can be saved in a parameter file by using this software.

■ Saving 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 shown.

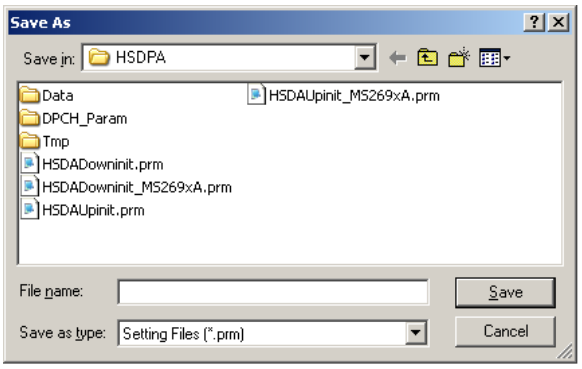


Figure 3.2.9-1 Parameter file saving screen

2. Enter a file name in the **File name** text box and click the **Save** button to save the parameter file.
   When the save destination is not changed in the **Save in** box, the parameter file is saved in the following directory with the entered file name:
   X:\IQproducer\HSDPA*Entered file name*.prm
   ("X:\IQproducer" indicates the folder where the IQproducer™ is installed.)

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.

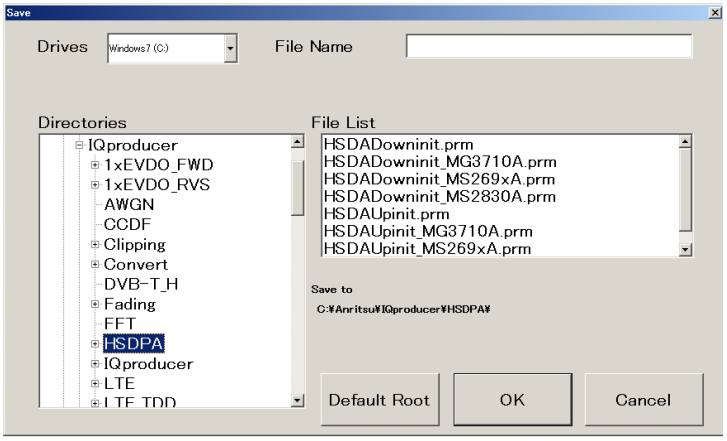


Figure 3.2.9-2 Parameter file saving screen (MG3710A)

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.

■ Reading 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 shown.

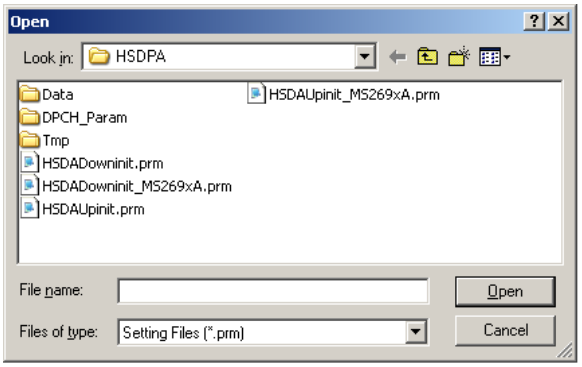


Figure 3.2.9-3 Parameter file reading screen

2. Select a parameter file to be read from the file list, and then click the **Open** button 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.

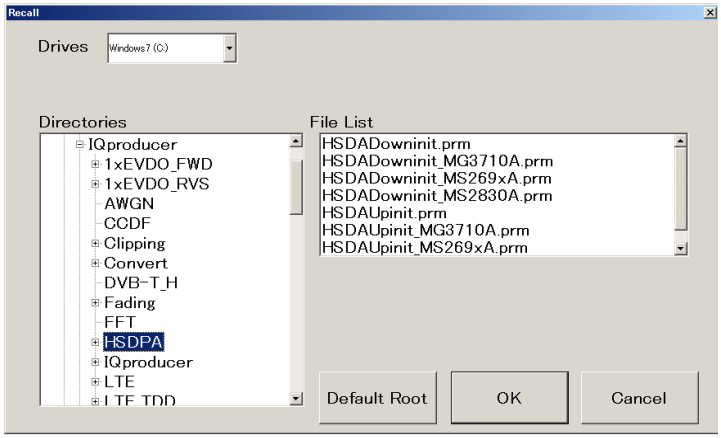


Figure 3.2.9-4 Parameter file reading screen (MG3710A)

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.

3.2.10 Generating waveform pattern file

A waveform pattern file to be used in the mainframe can be generated based on the setting values.

The number of frames to be generated varies depending on the setting conditions for each channel, and the time required for generating a waveform pattern also varies accordingly.

<Procedure>

1. Select **Calculate Waveform Pattern** from the **Edit** menu or click the  tool button.

At this time, the Warning message shown below appears when the total power is not normalized by clicking the **Normalize Power** button.

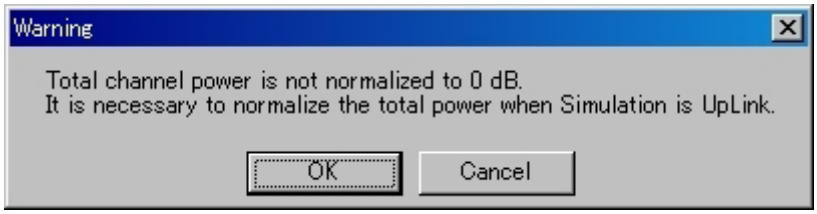


Figure 3.2.10-1 Warning message

Click the **OK** button to normalize the **Total Power** and proceed with the next step.

2. The file name input screen is displayed.

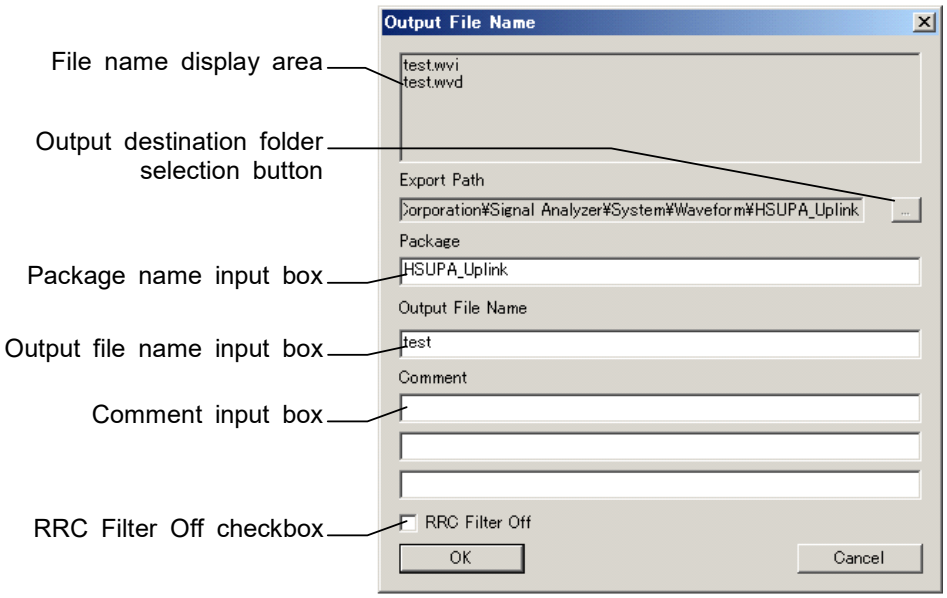


Figure 3.2.10-2 File name input screen

Enter a package name in the package name input box, up to 31 characters.
Enter a file name in the file name input box, up to 20 characters
1-byte alphanumeric characters and the following symbols can be used for a file name:
! % & ( ) + = ` { } _ - ^ @ [ ]

When a file name is entered, the file to be generated is displayed in the file name display area in the following format:

File name format:

test.wvi
- Extension: wvi… Information file (text format)
  wvd… Data file (binary format)
- Entered file name

Enter a comment for the waveform pattern in a comment input box.
Three comment input boxes are provided, and a comment can be entered in each line within 38 characters.
1-byte alphanumeric characters and symbols can be used for comments.

The contents of each comment are displayed on the screen when the corresponding waveform pattern is selected by the Vector Signal Generator. Leave the comment boxes blank if not necessary.

When the RRC Filter Off check box is selected, symbol data that does not pass through the RRC filter is generated as a waveform pattern. This check box needs not be selected under normal conditions.

3. Click **OK** on the Export File screen. The Calculation screen shown in Figure 3.2.6-1 is displayed and waveform pattern generation starts (the output destination folder, 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, Windows 10, Windows 11	C:\Anritsu\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, clicking the output destination selection button displays the Browse for Folder screen shown in Figure 3.2.10-3. The output destination folder can be selected from this screen.

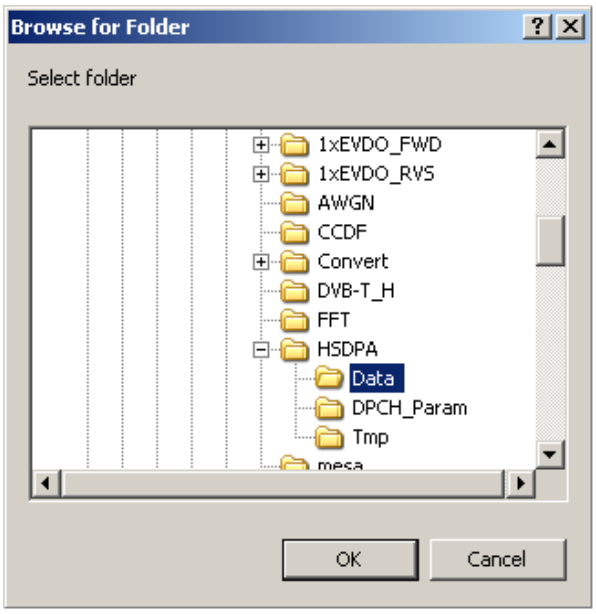


Figure 3.2.10-3 Browse for Folder screen

If no destination folder is selected, the file is generated in the following folder.
X:\IQproducer\HSDPA\Data
(Where "X:\IQproducer" is the folder you installed IQproducer™).

Note:

The HSDPA/HSUPA Downlink IQproducer waveform pattern file generation and the HSDPA/HSUPA Uplink IQproducer waveform pattern file generation must be operated exclusively. An error dialog box will be displayed if the HSDPA/HSUPA Uplink IQproducer waveform pattern file generation is started while the HSDPA/HSUPA Downlink IQproducer waveform pattern file generation is operating, and vice versa. To start the HSDPA/HSUPA Uplink/Downlink IQproducer waveform pattern file generation while the other is operating, cancel the other file generation or wait until the other file generation is completed.

3.2.11 Auxiliary signal output

When a waveform pattern generated by this software is selected by the mainframe, a marker signal synchronized with the RF signal is output from the AUX input/output connector of the rear panel as an auxiliary signal. Frame Pulse (Connector 1) is output.

- Frame Pulse
  10 ms cycle pulse synchronized with the symbol at the beginning of the frame is output from Connector 1. The signal polarity can be changed by changing the polarity of Marker 1.

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.

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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/MG3710E 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/MG3710E 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/MG3710E 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/MG3710E 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/MG3710E 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/MG3710E 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/MG3710E 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/MG3710E 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/MG3710E 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/MS2840A 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/MS2840A 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/MS2840A 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/MS2840A 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/MS2840A Signal Analyzer Vector Signal Generator Operation Manual (Remote Control)*

Appendix A Error Messages

A list of error messages is shown below.

Table A-1 Error messages

Error Message	Description
Initialization error	An application initialization error occurred.
Selection of an inaccurate file. ("*File name*")	The selected file type (waveform file) is invalid.
Can not open file. ("*File name*")	The file cannot be opened.
Invalid file format. ("*File name*")	The contents of the selected file (waveform information file) are invalid.
The data of a Wave-form file is unusual.	The waveform pattern data is abnormal.
Can not write file. ("*File name*")	A file writing error occurred.
Can not read file.	A file reading error occurred.
An "IQproducer" is down. Application is shutdown.	The application is exited since a platform abnormal error occurred.
Can not open the parameter file. ("*File name*")	A setting file reading error occurred.
The Setting value is invalid *Parameter name*.	An invalid setting value error occurred.
The Setting value is out of range. "(*Parameter name (minimum value – maximum value)*)"	An out-of-range setting value error occurred.
Total channel power except OCNS is over 0 dB.	A total power error occurred.
Channelization Code Conflicted.	An orthogonal warning occurred.
An initial parameter file was not able to be read.	An initial parameter file error occurred.
PN9 for HSDPA channels cannot be selected when the Process Cycle is more than 6, change the data except PN9.	A process cycle setting error occurred.
All Channels are OFF.	All channels are OFF.
Input File Name.	Input a file name.
Value is set up at 800 steps.	A setting unit error occurred. * 800 is set as a setting unit, for example.
Process Setting File read error. (*"File name"*).	A process file reading error occurred.
Pattern Setting File read error. (*"File name"*).	A pattern file reading error occurred.
DTCH information data is changed to the data truncated every one frame (PN9fix).	A DTCH information change warning is alerted.
Payload Information Data for HS-DSCH or Data for HS-SCCH/HS-PDSCH is changed to the data truncated every subframe (PN9fix).	A HS-SCCH/HS-PDSCH information change warning is alerted.
Total channel power is not normalized to 0 dB. It is necessary to normalize the total power when OCNS is OFF.	A warning is alerted that normalization is not executed.
Total channel power is not normalized to 0 dB. It is necessary to normalize the total power when Simulation is UpLink.	A warning is alerted that normalization is not executed.
Channel Edit Parameters are invalid.	The parameters on the Channel Edit screen are invalid.
Channel Gain Setup Error.	The parameters on the Channel Gain Setup screen are invalid.

Table A-1 Error messages (Cont'd)

Error Message	Description
DPCH information is changed to the data truncated every one frame (PN9fix).	DPCH information was changed from PN9 to PN9fix.
TrCH data is changed to the data truncated every one frame (PN9fix).	TrCH data was changed from PN9 to PN9fix.
DPCH Data and TrCH data is changed to the data truncated every one frame (PN9fix).	DPCH information and TrCH data were changed from PN9 to PN9fix.
The '*parameter name'* of CSV file is invalid.	An illegal value is set in the HARQ process setting file.
The 'Information Bit Payload' is too large for 'E-DPDCH Ch Codes.'	The Information Bit Payload value set in the HARQ process setting file is too large with respect to the E-DPDCH Ch Codes setting value. Adjust the Information Bit Payload value according to the Information Bit Payload maximum value list that will be displayed along with the error message.
Memory option cannot be turned on in MS269x mode.	The memory option is not available for the IQproducer™ for MS269x. ***Note:*** This message is available only when MS269x is selected in the Select instrument screen at startup.

Appendix B Number of Frames to Be Generated

B.1 For MG3700A and MG3710A

The MG3700A and MG3710A has two arbitrary waveform memories from which different waveform patterns can be output separately. It is possible to add two signals, such as a desired signal + AWGN, using the baseband to be output as one RF signal.

Note:

If MG3710A is used as a mainframe and if adding two signals at baseband and outputting as one RF signal, the combination of baseband signal option must installed.

When using the memories A and B individually as is in a normal case, however, the memory length may not sufficient for handling a waveform pattern with a long period that is used in a reception test. (A long-period waveform pattern may be caused as a result of the settings for SFN included in BCH, or the settings for HARQ Process Cycle when [PN9]] is selected for the DCH data type.)

This problem may be resolved by using the capacities of both memories A and B to generate a waveform pattern. This is available by switching memories A and B alternately as shown in Figure B.1-1 below. Note, however, that it is not possible to add two signals such as AWGN and interference signals in this event.

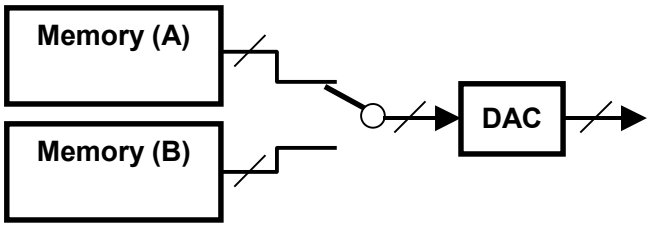


Figure B.1-1 Pattern Using FIR filter

If enough data length is still not obtained though the above memory configuration is configured, use the function to execute filtering processing using the FIR filter of the hardware incorporated in the MG3700A as shown in Figure B.1-2. If a waveform pattern that is filtered at data generation exceeds the total capacity of the arbitrary memories A and B, this hardware filtering function is used to automatically generate the waveform pattern.

However, waveform patterns used in this configuration are not applicable for interference signals because the number of taps of the FIR filter is less than the normal waveform pattern.
Moreover, it is also not possible to add two signals such as AWGN and interference signals in this event.

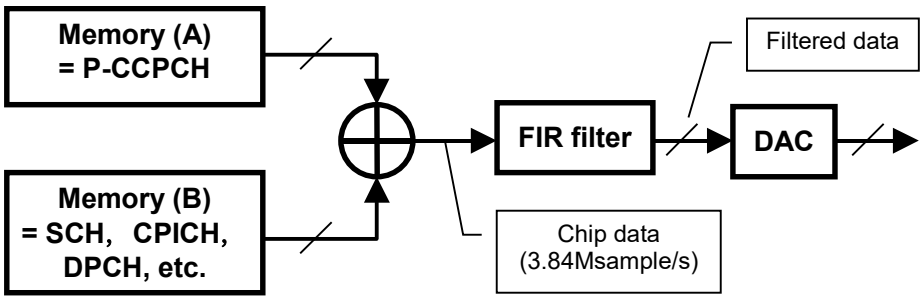


Figure B.1-2 Block Diagram with FIR Filter Used

Table B.1-1 below lists the maximum number of frames in each memory configuration.

Table B.1-1 Maximum Number Of Generatable Frames For Each Condition: MG3700A

ARB Memory Expansion Option	FIR Filter	Used Memory	Max. No. of Frames	Addition of AWGN and Interference Signal
Installed	Not used	A or B	2330	Enabled
		A & B	4660	Disabled
	Used	A & B	A: 27962 B: 6990	Disabled
Not installed	Not used	A or B	1165	Enabled
		A & B	2330	Disabled
	Used	A & B	A: 13981 B: 3495	Disabled

Table B.1-2 Maximum Number Of Generatable Frames For Each Condition (Without ARB Memory Expansion Option): MG3710A

Combination of Base-band Signal Option	FIR Filter	Used Memory	Max. No. of Frames	Addition of AWGN and Interference Signal
Installed	Not used	A or B	582	Enabled
		A & B	1165	Disabled
	Used	A & B	A: 6990 B: 1747	Disabled
Not installed	Not used	-	1747	Disabled
	Used	-	582	Disabled

Table B.1-3 Maximum Number Of Generatable Frames For Each Condition (With ARB Memory Expansion 256M sample or ARB Memory Expansion 1024M sample): MG3710A

Combination of Baseband Signal Option	FIR Filter	Used Memory	Max. No. of Frames	Addition of AWGN and Interference Signal
Installed	Not used	A or B	2330	Enabled
		A & B	4660	Disabled
	Used	A & B	A: 27962 B: 6990	Disabled
Not installed	Not used	-	6990	Disabled
	Used	-	2330	Disabled

B.2 For MS2690A/MS2691A/MS2692A or MS2830A

Table B.2-1 shows the number of frames that can be generated.

Table B.2-1 Maximum Number of Frames That Can Be Generated

RRC Filter	Max. No. of Frames
On (normal setting)	2330
Off	6990

References are to page numbers.

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