

MX371055A

Interference Waveform Pattern for 5G NR Receiver Test Operation Manual

First 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 MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual. Please also refer to it before using the equipment.
- Keep this manual with the equipment.

ANRITSU CORPORATION

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-  **DANGER** This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.
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This indicates a note. The contents are described in the box.



These indicate that the marked part should be recycled.

MX371055A
Interference Waveform Pattern for 5G NR Receiver Test
Operation Manual

12 January 2022 (First Edition)

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Revision History:

- February 29th, 2020
- December 17th, 2021

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
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- 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.

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

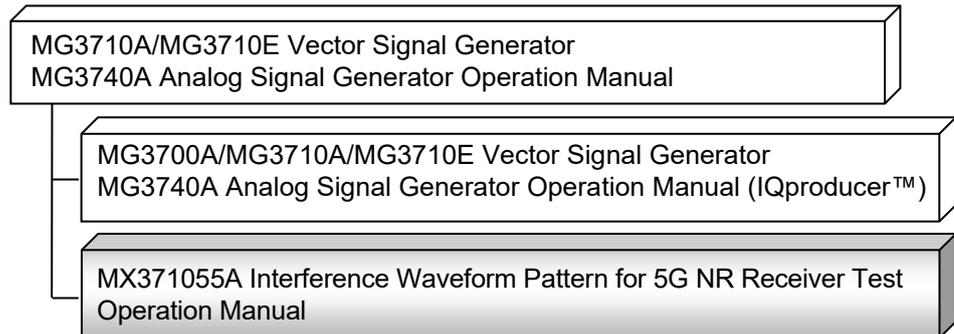
- Simultaneously running any software other than that recommended or approved by Anritsu
- Closing the lid (Laptop computer)
- Turning on the screen saver function
- Turning on the battery-power saving function (Laptop computer)

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 MX371055A Interference Waveform Pattern for 5G NR Receiver Test is shown below.



- MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual

This describes basic operations, maintenance procedure, and remote functions.

-
- 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 Signal Generator.

-
- MX371055A Interference Waveform Pattern for 5G NR Receiver Test Operation Manual (This document)

This describes basic operations and functions of the Interference Waveform Pattern for 5G NR Receiver Test.

■ Note about description

Long document names are shortened as below in this manual.

- *MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual*
→ *MG3710A/MG3710E Operation Manual*
- *MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)*
→ *MG3710A/MG3710E IQproducer™*

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Chapter 1 Overview

This chapter provides an overview of the MX371055A Interference Waveform Pattern for 5G NR Receiver Test (hereafter “this waveform pattern”).

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1.1 Product Overview

MX371055A Interference Waveform Pattern for 5G NR Receiver Test (hereafter “this waveform pattern”) contains QPSK modulation waveform patterns of interference for 5G NR UE Receiver Test conforming to the 3GPP standard and table at the table 1.1-1.

Downloading this waveform pattern to the MG3710A/MG3710E Vector Signal Generator (hereafter MG3710A/MG3710E) supports generation of interference signals used at Receiver test items in Table 1.1-1.

Use of this waveform pattern requires a license corresponding to the serial number of the MG3710A/MG3710E using the pattern. When using this pattern on multiple MG3710A/MG3710E units, a license must be purchased for each MG3710A/MG3710E unit using this pattern.

The MG3710A/MG3710E must include the minimum required configuration shown in Table 1.1-1 when using this waveform pattern.

Table 1.1-1 3GPP standard, Table, Test Item, Min. configuration

Standard	3GPP TS 38.521-1 V17 UE conformance specification; Radio transmission and reception; Part 1: Conformance testing
Tables	Table A.3.2.2-1: Fixed reference channel for receiver requirements (SCS 15 kHz, FDD, QPSK 1/3) Table A.3.2.2-3: Fixed reference channel for receiver requirements (SCS 60 kHz, FDD, QPSK 1/3) Table A.3.3.2-1: Fixed reference channel for receiver requirements (SCS 15 kHz, TDD, QPSK 1/3) Table A.3.3.2-2: Fixed reference channel for receiver requirements (SCS 30 kHz, TDD, QPSK 1/3)
Receiver test items	7.5 Adjacent Channel Selectivity 7.6.2 In-band blocking 7.8.2 Wide band Intermodulation
Minimum required configuration	MG3710A Vector Signal Generator MG3710A-036 1stRF 100kHz to 6GHz
	MG3710E Vector Signal Generator MG3710E-036 1stRF 100kHz to 6GHz

If the MG3710A/MG3710E-066/166 2nd RF 100kHz to 6GHz is installed on the MG3710A/MG3710E, the 2nd RF Output becomes available.

1.2 Product Composition

Table 1.2-1 shows the composition of this waveform pattern product. At unpacking, check that all items listed in Table 1.2-1 are included. If any item is missing, contact your Anritsu sales representative immediately.

Table 1.2-1 Product Composition

Item	Model/Symbol	Product name	Q'ty	Remarks
Software	MX371055A	Interference Waveform Pattern for 5G NR Receiver Test	1	DVD-R Includes license file and operation manual

Chapter 2 *How to Use Waveform Patterns*

The following operations are required to output MX371055A Interference Waveform Pattern for 5G NR Receiver Test (hereafter “this waveform pattern”) from the MG3710A/MG3710E:

- Transferring this 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 the MG3710A/MG3710E

This chapter explains the details of these operations.

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2.1 Preparing Waveform Pattern

This section describes how to download a created waveform pattern to the hard disk of the MG3710A/MG3710E and output the pattern.

2.1.1 Installing waveform license

To load the waveform pattern to the memory, the license file corresponding to each pattern must be installed. Refer to the following for installation of the license file.

- *MG3710A/MG3710E Operation Manual*
9.4.4 “Install”, “Adding/deleting waveform licenses: Waveform Licenses”

2.1.2 Transferring waveform pattern to internal hard disk

There are two ways of transferring the waveform pattern created with this waveform pattern to the internal hard disk:

- LAN
- External device such as USB flash drive

- Transferring from PC to MG3710A/MG3710E via LAN

Two IQproducer™ tools can be used to transfer a waveform pattern to the MG3710A/MG3710E via a LAN.

- **Transfer & Setting Wizard**

Start this wizard by clicking the **Transfer & Setting Wizard** button of IQproducer™ or by selecting **Simulation & Utility** tab → **Transfer & Setting Wizard** from the IQproducer™ after creating a waveform pattern.

For details, refer to 4.7 “File Transfer and Loading to Memory Using Transfer & Setting Wizard” in the *MG3710A/MG3710E IQproducer™*. Transferring a waveform pattern to the internal hard disk of the MG3710A/MG3710E, 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 5.2 “Transferring Waveform Pattern” in the *MG3710A/MG3710E IQproducer™*.

Specify the folder that contains the waveform pattern to transfer to the MG3710A/MG3710E in the PC-side tree of **Transfer & Setting Panel**.

- Transferring via external device such as USB flash drive

For how to transfer a waveform pattern to the internal hard disk of the MG3710A/MG3710E, refer to 7.3.6 “Copying external waveform pattern: Copy” in the *MG3710A/MG3710E Operation Manual*.

2.1.3 Loading to waveform memory

To output a modulated signal using this waveform pattern, it is necessary to load the waveform pattern that was transferred to the internal hard disk of the MG3710A/MG3710E (described in 2.1.2 “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 MG3710A/MG3710E**

A waveform pattern can be loaded into the waveform memory by using the instruction panel of the MG3710A/MG3710E or by using a remote command.

For operation using the front panel, refer below:

- *MG3710A/MG3710E Operation Manual*
7.3.4 “Loading waveform pattern: Load”

For operation using remote commands, refer below:

- *MG3710A/MG3710E Operation Manual*
7.3.4 “Loading waveform pattern: Load”

■ **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 4.6 “File Transfer and Loading to Memory in Transfer & Setting Panel Screen” in the *MG3710A/MG3710E IQproducer™*.

2.1.4 Selecting waveform pattern

Select a waveform pattern to use for modulation from the waveform patterns loaded into the waveform memory of the MG3710A/MG3710E according to 2.1.3 “Loading to waveform memory”. A waveform pattern can be selected in the following two ways.

■ Configuring using the MG3710A/MG3710E

Waveform patterns to be used for modulation can be selected by using the instruction panel of the MG3710A/MG3710E or by using a remote command.

For operation using the front panel, refer below:

- *MG3710A/MG3710E Operation Manual*
7.3.5 “Selecting output waveform pattern: Select”

For operation using remote commands, refer below:

- *MG3710A/MG3710E Operation Manual*
7.3.5 “Selecting output waveform pattern: Select”

■ 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 4.6 “File Transfer and Loading to Memory in Transfer & Setting Panel Screen” in the *MG3710A/MG3710E IQproducer™*.

2.1.5 Outputting waveform pattern again

Output starts as soon as a waveform pattern is selected. Use the following procedure to output the same waveform pattern again.

Press **F8 Restart** in the ARB/Waveform function menu.

- Refer to “F8 Restart” in Table 7.3.1-2 in the *MG3710A/MG3710E Operation Manual*.

Waveform is also output by applying trigger.

- Refer to 7.3.8 “Start/Frame Trigger” in the *MG3710A/MG3710E Operation Manual*.

Chapter 3 Details of Waveform Pattern

This chapter explains details of the MX371055A Interference Waveform Pattern for 5G NR Receiver Test (hereafter this waveform pattern).

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3.1 Waveform Pattern Type

The patterns recorded in this waveform pattern are explained in this section.

Section 3.1.1 shows the QPSK modulation waveform patterns of interference for 5G NR UE Receiver Test conforming to the 3GPP standard.

Note:

Before testing, we recommend transferring all the waveform patterns to the MG3710A/MG3710E and loading them into waveform memory.

3.1.1 Interference Waveform Pattern for 5G NR Receiver Test

QPSK modulation waveform patterns for the MG3710A/MG3710E are the interferences for 5G NR UE Receiver Test using interference conforming to the 3GPP standard.

Table 3.1.1-1 shows the Channel Bandwidth (CBW), Subcarrier spacing (SCS), and Allocated resource blocks (Allocated RB) supported by each waveform pattern.

Table 3.1.1-1 CBW, SCS, and Allocated RB of Waveforms

Waveform Pattern Name	CBW [MHz]	SCS [kHz]	Allocated RB
DL_SCS15_BW5_FullRB	5	15	25
DL_SCS15_BW10_FullRB	10	15	52
DL_SCS15_BW15_FullRB	15	15	79
DL_SCS15_BW20_FullRB	20	15	106
DL_SCS15_BW40_FullRB	40	15	216
DL_SCS15_BW50_FullRB	50	15	270
DL_SCS30_BW10_FullRB	10	30	24
DL_SCS30_BW15_FullRB	15	30	38
DL_SCS30_BW20_FullRB	20	30	51
DL_SCS30_BW40_FullRB	40	30	106
DL_SCS30_BW50_FullRB	50	30	133
DL_SCS30_BW60_FullRB	60	30	162
DL_SCS30_BW80_FullRB	80	30	217
DL_SCS30_BW90_FullRB	90	30	245
DL_SCS30_B100_FullRB	100	30	273

