Manuals+ — User Manuals Simplified.

Anritsu MX371055A Interference Waveform Pattern Software User Guide

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.

Contents

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the

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

Symbols used in manual

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

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

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

Safety Symbols Used on Equipment and in Manual

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

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

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

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

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

♻ ⌫ These indicate that the marked part should be recycled.

MX371055A
Interference Waveform Pattern for 5G NR Receiver Test Operation Manual
12 January 2022 (First Edition)
Copyright © 2022, ANRITSU CORPORATION.
All rights reserved. No part of this manual may be reproduced without the prior written permission of the publisher.
The operational instructions of this manual may be changed without prior notice.
Printed in Japan

Equipment Certificate

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

Anritsu Warranty

- During the warranty period, Anritsu Corporation will repair or exchange this software free-of-charge if it proves defective when used as described in the operation manual.

- The warranty period is 6 months from the purchase date.

- The warranty period after repair or exchange will remain 6 months from the original purchase date, or 30 days from the date of repair or exchange, depending on whichever is longer.

- This warranty does not cover damage to this software caused by Acts of God, natural disasters, and misuse or mishandling by the customer.

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

resold.

Anritsu Corporation shall assume no liability for damage or financial loss of the customer due to the use of or a failure to use this equipment, unless the damage or loss is caused due to Anritsu Corporation's intentional or gross negligence.

Anritsu Corporation Contact

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

Notes On Export Management

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

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

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

Software End-User License Agreement (EULA)

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

Article 1. Grant of License and Limitations

1. You may not sell, transfer, rent, lease, lend, disclose, sublicense, or otherwise distribute this Software to third parties, whether or not paid therefor.

2. You may make one copy of this Software for backup purpose s onl y.

3. You are not permitted to reverse engineer, disassemble, decompile, modify or create derivative works of this Software.

4. This EULA allows you to install one copy of this Software on one piece of Equipment.

Article 2. Disclaimers

To the extent not prohibited by law, in no event shall Anritsu be liable for direct, or any incidental, special, indirect or consequential damages whatsoever, including, without limitation, damages for loss of profits, loss of data, business interruption or any other commercial damages or losses, and damages claimed by third parties, arising out of or related to your use or inability to use this Software, unless the damages are caused due to Anritsu's intentional or gross negligence.

Article 3. Limitation of Liability

1. If a fault (bug) is discovered in this Software,making this Software unable to operate as described in the operation manual or specifications even though you have used this Software as described in the manual, Anritsu shall at its own discretion, fix the bug, or replace the software, or suggest a workaround, free-of-charge, provided, however, that the faults caused by the following items and any of your lost or damaged data whatsoever shall be excluded from repair and the warranty.

    i) If this Software is deemed to be used for purposes not described in the operation manual or specifications.

    ii) If this Software has been used in conjunction with other non-Anritsu-approved software.

    iii) If this Software or the Equipment has been modified, repaired, or otherwise altered without Anritsu's prior approval.

    iv) For any other reasons out of Anritsu's direct control and responsibility, such as but not limited to, natural disasters, software virus infections, or any devices other than this Equipment, etc.

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

3. The warranty period for faults listed in Section 1 of this Article shall be either 6 months from the date of purchase of this Software or 30 days after the date of repair or replacement, whichever is longer.

Article 4. Export Restrictions

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

Article 5. Change of Terms

Anritsu may change without your approvalthe terms of this EULA if the changes are fthe benefit of general customers, or are reasonable in light of the purpose of this EULA and circumstances of the changes. A the time of change, Anritsu will inform you of those changes and its effective date, as ageneral rule 45 days, in advance on its website, or in writing or by e-mail.

Article 6. Termination

1. Anritsu may terminate this EULA immediately if you violate any conditions described herein. This EULA shall also be terminated immediately by Anritsu if there is any good reason that it is deemed difficult to continue this EULA, such as your violation of Anritsu copyrights, patents, etc. or any laws and ordinances, or if it turns out that you belong to an antisocial organization or has a socially inappropriate relationship with members of such organization.

2. You and Anritsu may terminate this EULA by a written notice to the other party 30 days in advance.

Article 7. Damages

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.

Article 8. Responsibility after Termination

Upon termination of this EULA in accordance with Article 6, you shall cease all uses of this Software immediately and shall as directed by Anritsu either destroy or return this Software and any backup copies, full or partial, to Anritsu.

Article 9. Negotiation for Dispute Resolution

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

Article 10. Governing Law and Court of Jurisdiction

This EULA shall be governed by and interpreted in accordance with the laws of Japan without regard to the principles of the conflict of laws thereof, and any disputes arising from or in relation to this EULA that cannot be resolved by negotiation described in Article 9 shall be subject to and be settled by the exclusive agreed jurisdiction of the Tokyo District Court of Japan.

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

  – 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 MX371055A Interference Waveform Pattern for 5G NR Receiver Test is shown below.
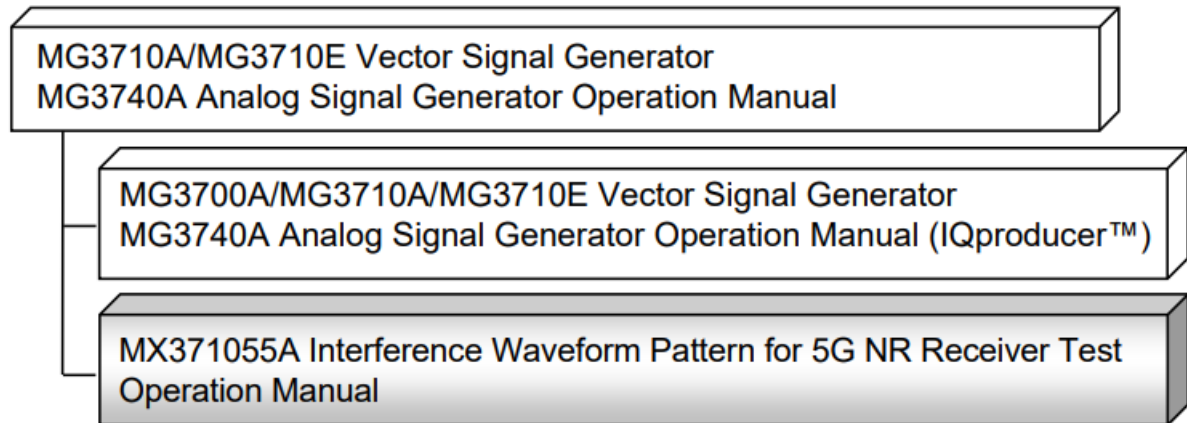
- MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual

  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™

Overview

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

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 anyitem 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

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

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.

Details of Waveform Pattern

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

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

Documents / Resources

Anritsu MX371055A Interference Waveform Pattern Software [pdf] User Guide
MX371055A Interference Waveform Pattern Software, MX371055A, Interference Waveform Pattern Software, Waveform Pattern Software, Pattern Software, Software

References

- **User Manual**